European Journal of Business and Innovation Research, 14(2),1-25, 2026
Print ISSN: 2053-4019(Print)
Online ISSN: 2053-4027(Online)
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development -UK

Digital Technology Adoption: An Imperative for Performance Among Supervisory Agencies in the Nigerian Communications Sector

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doi: https://doi.org/10.37745/ejbir.2013/vol14n2125 Published March 12 , 2026

Citation: Uzochukwu I.U., Gambo N., Nwoye M.I. (2026) Digital Technology Adoption: An Imperative for Performance Among Supervisory Agencies in the Nigerian Communications Sector, *European Journal of Business and Innovation Research*, 14(2),1-25

Abstract: *This study examines how digital technology adoption influences service delivery efficiency in supervisory agencies within Nigeria's communications sector. Grounded in the Unified Theory of Acceptance and Use of Technology and complemented by a credibility lens, the study evaluates three antecedents of adoption—performance expectancy, effort expectancy, and social influence. A quantitative, cross-sectional survey was administered to permanent staff across six core agencies: NCC, NITDA, Galaxy Backbone, NIPOST, NDPC, and NIGCOMSAT. A multistage hybrid sampling approach combined stratified, purposive, and simple random procedures. Data were collected using a structured questionnaire with five-point Likert scale. Analysis comprised descriptives, correlations, multiple regression, and a mediation-by-interaction specification; diagnostics included adjusted R-square, variance inflation factors, and Durbin–Watson. The model explained 60.1 percent of the variance in service delivery efficiency with adjusted R-square of 0.583 and Durbin–Watson 1.901. Findings indicate that while PE has a positive and statistically significant effect on service delivery efficiency, EE and SI do not display a unique direct effect once other drivers are held constant. It is recommended that supervisory agencies should continue to utilize task dashboards, before and after process metrics, and structured user feedback to ensure that usability gains travel through intention and habit into consistent performance. Practical priorities include strengthening security governance, access control, monitoring, incident response, and audit trails; reinforcing intention through role-linked training, responsive support, and recognition; and targeting infrastructure and support deficits in motivated units. The study contributes by clarifying the hierarchy of adoption drivers in a regulated public setting.*

Keywords: performance expectancy, effort expectancy, social influence, service delivery efficiency

INTRODUCTION

The digital revolution has redefined governance worldwide, introducing powerful tools to enhance transparency, efficiency, and citizen engagement. Digital technologies now play a transformative role across public sectors, streamlining processes and improving access to services (Samsor, 2020; Tangi et al., 2020). This digital revolution has enabled the telecommunications industry in Nigeria to

contribute a record 14.4% to the nation's GDP as at the last quarter of 2024 (NCC, 2025). In Nigeria, the potential benefits of these innovations are particularly relevant, as the public sector faces intricate administrative challenges amidst rapid population growth, a rapidly expanding percentage of the population connected to the internet and rising socio-economic demands (Igbokwe-Ibeto, 2019). In contrast, the government agencies responsible for regulating the communications sector are struggling to keep pace with technological advancements and evolving regulatory demands. There is therefore an urgent need for these public sector organizations to adopt digital technology so as to modernize their operations and effectively carry out their regulatory oversight functions in an increasingly complex telecommunications landscape. However, the path to digitalization is encumbered by a range of adoption challenges and implementation obstacles that continue to obstruct progress. Without effectively addressing these barriers, the integration of digital solutions within the Nigerian public sector could remain limited, ultimately stalling governance improvements and national development (Warrick, 2023; Bjerke-Busch & Aspelund, 2021).

The UTAUT framework identifies four core determinants of technology adoption: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy, which refers to the perceived benefits of using a technology, is crucial for regulatory agencies seeking to enhance their effectiveness. For instance, digital technologies such as blockchain, big data analytics, and artificial intelligence can improve monitoring, compliance, and decision-making processes. Supervisory agencies in the Nigerian communications sector are more likely to adopt these technologies if they perceive them as instrumental in achieving regulatory goals, such as reducing fraud and ensuring service quality (Batubara et al., 2018; Sharma, 2022).

Digital technology adoption has emerged as a global and critical determinant of operational efficiency and policy implementation in the public sector, providing transformative potential for enhancing service delivery, transparency, and stakeholder engagement. However, for developing nations in particular, significant and multifaceted barriers to digital technology adoption persist which include structural and cultural barriers such as limited infrastructure, insufficient technological skills, budgetary constraints, interoperability issues, and resistance to change (Zulkifl, 2024). The Nigerian public sector reflects the global narrative and exemplifies these challenges, with supervisory agencies struggling to transition effectively into digital frameworks, necessitating deeper investigations into strategies for overcoming these challenges (Binsar et al., 2024; Al-Emran & Griffy-Brown, 2023; Gholami et al., 2021). Recent studies highlight that the most critical barriers to the adoption of digital technology in developing countries are privacy concerns, illiteracy, limited economic accessibility, financial and adoption constraints and institutional and knowledge barriers (Zulkifli, 2024; Afrizal et al., 2024).

Within Nigeria's supervisory agencies, core Unified Theory of Acceptance and Use of Technology (UTAUT) constructs reveal significant adoption barriers that hinder digital transformation adoption. Performance Expectancy remains compromised due to inconsistent implementation and limited evidence of measurable outcomes and tangible benefits in regulatory settings, leading to employee skepticism and resistance (Venkatesh et al., 2016; Dwivedi et al., 2023). Effort Expectancy is undermined by complex digital platforms requiring substantial training and technical proficiency, compounded by inadequate digital literacy among public sector personnel (Chiu & Yang, 2019; Blichfeldt & Faullant, 2021). Social Influence is diminished by hierarchical bureaucracies and inconsistent leadership support that impede collaborative technology adoption (David et al., 2023;

Wang & Connolly, 2021). Facilitating Conditions remain inadequate, with poor internet connectivity, budget constraints, and lack of system interoperability creating significant adoption barriers (Ejemeyovwi et al., 2019; Bwalya et al., 2023). Traditional work habits further complicate the transition to digital frameworks, as employees often revert to familiar manual processes without sustained engagement and reinforcement (Batubara et al., 2018; Acquah et al., 2024). Perceived Credibility issues persist due to concerns over data privacy, cyber threats, and regulatory compliance, causing hesitation in fully integrating technology into regulatory processes (Ogunode & Abubakar, 2023; Fang & Liu, 2024).

Despite the critical importance of digital transformation in Nigeria's communications sector, a significant research gap exists in understanding how digital technology adoption affects the performance of the sector's supervisory agencies. Specifically, the application of the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to Nigerian supervisory agencies in the communications sector remains under-researched. While UTAUT has been widely employed globally, its application to unique challenges faced by agencies such as the Nigerian Communications Commission (NCC) is limited (et al., 2016; Dwivedi et al., 2023).

Critical research gaps persist in several areas. Organizational culture and regulatory frameworks within the UTAUT model remain inadequately addressed in Nigeria's regulatory environment. Another identified gap is that existing research predominantly employs simplistic methodologies—descriptive or qualitative case studies—which are insufficient to unpack complex interrelationships among variables. Advanced analytical techniques like multiple regression and interaction analysis could provide deeper insights into how UTAUT variables interact with mediators to drive adoption outcomes. Furthermore, most existing studies focus on short-term effects, overlooking long-term sustainability and impact of digital transformation on regulatory effectiveness. Longitudinal studies would assess broader implications and durability of the digital transformation process (Dwivedi et al., 2023). In addition, institutional and socio-political factors influencing digital adoption remain underexplored. While technical infrastructure, leadership culture, and training have been identified as enablers or barriers, external elements such as government policy, international collaboration, and socio-political dynamics are often neglected. These factors are particularly relevant in Nigeria, where inadequate infrastructure, limited funding, and political instability compound digitalization difficulties (Bwalya et al., 2023; Wang & Connolly, 2021).

Finally, unique contextual challenges in Nigeria—including the digital divide, cybersecurity risks, and vendor lock-in—require greater attention. Understanding these challenges could inform targeted interventions to enhance digital transformation, ultimately strengthening regulatory capabilities and aligning Nigeria's communications sector with global standards (Ejemeyovwi, Osabuohien, & Adiat, 2019; Ogunode & Abubakar, 2023). The general objective of this study is to evaluate the Effect of Digital Technology Adoption on the Performance of Supervisory Agencies of the Nigerian Communications Sector. The specific objectives are to evaluate the effect of performance expectancy, effort expectancy and social influence on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector.

The following research hypotheses are formulated based on the objectives. These hypotheses aim to determine the significant factors influencing digital technology adoption and its effect on the efficiency of service delivery in Nigeria's communications regulatory agencies.

H_{O1}: There is no significant effect of performance expectancy on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector.
H_{O2}: There is no significant effect of effort expectancy on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector.
H_{O3}: There is no significant effect of social influence on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector.

This study is significant in its potential to contribute to the understanding of the factors influencing digital technology adoption within key supervisory agencies in Nigeria's communications sector. Given the crucial role these agencies play in shaping the digital landscape of the country, it is important to explore how digital technologies can improve their operations and service delivery efficiency. By focusing on the variables that drive digital adoption, such as performance expectancy, effort expectancy, and social influence, the study can identify key determinants that influence technology use and inform strategies to enhance digital adoption in public institutions.

Conceptual Clarification

Performance

Performance, as a concept, denotes the degree to which an organisation attains its stated objectives through efficient use of resources and effective processes. Classical information systems research frames performance as an outcome of technology investment mediated by organisational routines and capabilities (Melville et al., 2004). From this vantage, performance is not solely a financial indicator; it encompasses operational dimensions such as speed, accuracy, responsiveness, and compliance. By foregrounding these dimensions, scholars have emphasised that the mere presence of technology does not guarantee superior performance; rather, benefits accrue when technology is aligned with work processes and managerial practice (Melville et al., 2004; Venkatesh et al., 2016). Technology adoption literature frequently treats performance expectancy as the perceptual bridge between technology features and improved work outcomes. Within UTAUT, performance expectancy denotes the belief that using a technology will yield gains in job performance (Venkatesh, 2022). Studies across sectors corroborate this link: when employees perceive clear productivity gains from digital systems, they show greater willingness to adopt and utilise those systems, which in turn drives measurable efficiency improvements (Fang & Liu, 2024; Awawdeh et al., 2024). Thus performance expectancy operates both as an antecedent to adoption and as an early indicator of likely performance enhancements.

In sum, the literature supports a conceptualisation of performance that situates service delivery efficiency as both an outcome and a measurable proxy for organisational effectiveness in public-sector settings. Theory and evidence from digital transformation studies indicate that perceived usefulness, adequate facilitation, and institutional readiness determine whether digital adoption yields tangible efficiency gains (Venkatesh, 2022; Fang & Liu, 2024; Otia & Bracci, 2022). For research on supervisory agencies in Nigeria's communications sector, this synthesis justifies operationalising performance through service delivery efficiency while modelling antecedent constructs such as performance expectancy and facilitating conditions to explain variation in outcomes.

Service Delivery Efficiency

Service delivery efficiency refers to the ability of an organisation to provide services effectively, promptly, and in a cost-efficient manner while meeting or exceeding stakeholder expectations. It involves optimising resource utilisation, streamlining operational processes, and enhancing responsiveness to achieve desired outcomes (Obi et al., 2022). In public and private sectors, service delivery efficiency is a critical determinant of performance, as it reflects the organization's capability to deliver value to its customers or citizens with minimal waste of time and resources (Bello et al., 2023). The concept encompasses both quantitative measures, such as the speed and cost of service, and qualitative aspects, such as user satisfaction and accessibility (Ajayi & Adebayo, 2023). For Supervisory agencies in the Nigerian communications sector, service delivery efficiency is paramount to fostering trust, compliance, and stakeholder satisfaction. Efficient service delivery ensures prompt resolution of disputes, effective monitoring of industry regulations, and timely updates on policy changes (Bello et al., 2023). By leveraging digital technology and addressing systemic challenges, these agencies can optimise their operations, enhance transparency, and strengthen their regulatory oversight capabilities. Ultimately, improved service delivery efficiency contributes to the sector's growth and stability, aligning with national development goals (Ajayi & Adebayo, 2023).

Digital Technology Adoption

Digital technology adoption denotes the process by which individuals, organisations, or institutions accept and integrate digital tools into routine practices to achieve specified objectives. Scholars frame adoption both as an individual behavioural outcome and as an organisational capability: individual acceptance models (e.g., TAM, UTAUT) explain why users decide to engage with technology, while organisational perspectives emphasise alignment with processes, resources and strategy (Davis, 1989; Venkatesh, 2022). Adoption, therefore, is not merely procurement or installation; it is a socio-technical transition that transforms work practices, decision-making and performance metrics over time (Venkatesh et al., 2016). The dominant theoretical lenses for studying digital adoption remain useful in linking perceptions to use. UTAUT constructs—Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions—have repeatedly shown explanatory power across sectors, identifying how perceived usefulness, ease of use, peer pressure and enabling infrastructure drive uptake (Venkatesh, 2022; Venkatesh et al., 2016). Empirical studies corroborate these pathways: when employees anticipate clear productivity gains and encounter supportive conditions, adoption and effective utilisation rise (Awawdeh, Al-Hiyari, & Ismail, 2024; Fang & Liu, 2024). For policy and managerial practice, the literature implies a blended approach: technical investments must be paired with capacity building, governance reform and user-centred design to convert adoption into performance gains. Public-sector studies emphasise the need for enabling conditions—funding, interoperable systems, leadership commitment—and targeted interventions such as training and change management to realise service delivery efficiency as a proxy for organisational performance (Otia & Bracci, 2022; Abdelhakim et al., 2022; Sonhaji et al., 2024). These findings guide research and practice in contexts like Nigeria's supervisory agencies, where addressing both perceptual drivers and structural constraints is essential for meaningful digital transformation.

Performance Expectancy

Performance expectancy refers to the degree to which an individual believes that using a specific system or technology will enhance their job performance or overall productivity. Rooted in the Unified Theory of Acceptance and Use of Technology (UTAUT), it is considered one of the most critical factors influencing technology adoption and use (Ajayi & Adebayo, 2023). In organisational contexts,

performance expectancy reflects the perceived benefits of a technology in improving work efficiency, accuracy, and effectiveness, making it a significant determinant of user acceptance (Bello et al., 2023). Performance expectancy encompasses various dimensions, including perceived usefulness, task efficiency, and outcome quality. Perceived usefulness refers to the extent to which users believe that adopting a technology will improve their task performance (Abass & Mehmood, 2021). Task efficiency highlights the ability of the technology to streamline processes and reduce effort, while outcome quality focuses on achieving better results with minimal errors (Ibrahim et al., 2023). These dimensions collectively influence user perceptions, shaping their intention to adopt and consistently utilise digital tools.

For Supervisory agencies in the Nigerian communications sector, performance expectancy is a pivotal factor in promoting the adoption of digital technologies. These agencies rely on digital tools to enhance their monitoring capabilities, streamline regulatory compliance, and provide timely interventions in the industry (Ibrahim & Mohammed, 2023). By fostering a clear understanding of the performance benefits of these technologies and addressing potential barriers, these agencies can encourage wider adoption and ensure sustained engagement. Ultimately, the successful integration of technology, driven by positive performance expectancy, contributes to improved agency performance and sectoral growth (Bello et al., 2023).

Effort Expectancy

Effort expectancy refers to the degree of ease associated with the use of a system or technology. It is a key construct in the Unified Theory of Acceptance and Use of Technology (UTAUT), often considered alongside performance expectancy to predict user adoption of technological innovations (Venkatesh et al., 2016). In essence, effort expectancy assesses the perceived complexity of a system and the cognitive or physical effort required to utilise it effectively. High effort expectancy, indicating ease of use, positively correlates with user acceptance and sustained engagement (Ajayi & Adebayo, 2023). The concept of effort expectancy comprises several dimensions, including system simplicity, user interface design, and learning requirements. System simplicity reflects how straightforward a technology is to use, with minimal complexity or steps involved (Ibrahim et al., 2023). User interface design emphasises intuitive layouts and functionalities that align with user preferences. Learning requirements capture the effort users need to invest in mastering the system, including training and technical support. Together, these dimensions shape users' perceptions of ease of use and influence their willingness to adopt and consistently use digital technologies (Sultana et al., 2023).

In the Nigerian communications sector, effort expectancy is pivotal for promoting the adoption of digital technologies among Supervisory agencies. These agencies often rely on digital tools to streamline regulatory activities, enhance data collection, and improve decision-making processes (Sultana et al., 2023). Ensuring that these technologies are user-friendly and supported by adequate training programs can significantly enhance their acceptance and utilisation. By prioritising effort expectancy in technology design and implementation, Supervisory agencies can achieve higher efficiency and effectiveness in their operations, ultimately benefiting the broader communications sector (Abass & Mehmood, 2021).

Social Influence

Social influence refers to the effect that the beliefs, attitudes, and behaviours of others have on an individual's decision-making process. In the context of technology adoption, it represents the extent to which individuals perceive that important others—such as peers, supervisors, or societal norms—believe they should use a particular technology (Venkatesh et al., 2016). This construct is a key component of the Unified Theory of Acceptance and Use of Technology (UTAUT), emphasising the role of social pressure and group dynamics in shaping technology-related behaviours (Ajayi & Adebayo, 2023). Social influence often manifests through direct persuasion, social norms, or observational learning, making it a powerful determinant of behaviour. Social influence is multidimensional, encompassing subjective norms, peer influence, and social identity. Subjective norms refer to the perceived expectations of significant others, such as family, friends, or colleagues, regarding the use of a technology (Bello et al., 2023). Peer influence highlights the role of colleagues or professional networks in shaping attitudes toward technology adoption. Social identity, on the other hand, relates to the degree to which individuals associate their technology use with belonging to a specific group or community (Ibrahim et al., 2023). These dimensions collectively shape how individuals respond to social cues and pressures in the context of technology adoption.

In the Nigerian communications sector, social influence is a critical factor influencing the adoption of digital technologies among Supervisory agencies. Stakeholders, including regulatory bodies and industry leaders, often shape the perceived necessity and credibility of these technologies (Bello et al., 2023). By leveraging social influence through awareness campaigns, peer networks, and leadership endorsements, agencies can foster a culture of technology acceptance and usage. Furthermore, addressing resistance through inclusive communication and showcasing the tangible benefits of digital tools can enhance their adoption and effectiveness, ultimately improving service delivery in the sector (Sultana et al., 2023).

Theoretical Framework

The most relevant theory to this study is the Unified Theory of Acceptance and Use of Technology (UTAUT). This research is based on the Unified Theory of Acceptance and Use of Technology (UTAUT), which provides a robust framework for analysing the effect of digital technology adoption on the performance of Supervisory agencies in the Nigerian communications sector. The relevance of this theory is underscored by its capacity to address critical adoption determinants such as Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions (Venkatesh, 2022), making it highly applicable to understanding the dynamics within this sector.

Performance Expectancy, a core determinant in UTAUT, focuses on users' beliefs that technology adoption will enhance their job performance. In the context of Nigeria's communications sector, this construct is highly relevant as Supervisory agencies like the Nigerian Communications Commission (NCC) increasingly rely on digital tools to improve operational efficiency. For instance, technologies such as spectrum management tools and automated licensing systems have been shown to streamline processes, reduce errors, and improve decision-making. Kapoor et al. (2022) noted that when employees observe tangible improvements in their productivity and outcomes, their willingness to adopt new systems increases. This aligns with findings by Zheng et al. (2022), who demonstrated that healthcare professionals adopted telemedicine technologies due to improved patient outcomes. Similarly, regulatory agencies in Nigeria can leverage these insights by emphasizing the performance

benefits of digital tools during the implementation phase. By linking technology use to measurable productivity gains, these agencies can foster widespread acceptance and effective utilization.

Effort Expectancy reflects the perceived ease of using a technology and is critical during the initial stages of adoption. Within Nigerian Supervisory agencies, the ease of deploying and navigating new regulatory technologies can significantly influence their acceptance. Tools designed with user-friendly interfaces and supported by comprehensive training programs are more likely to gain traction among staff. Al-Emran and Griffy-Brown (2023) emphasized that simplified interfaces and intuitive systems reduce cognitive load, making technology more accessible even to less tech-savvy users. This is particularly important in Nigeria, where varying levels of digital literacy exist across different employee groups. Abdullahi & Abdullah (2024) also highlighted that clear and structured onboarding processes enhance user confidence, facilitating smoother transitions to new systems. In Nigeria's communications sector, regulatory agencies must prioritize systems that align with these principles, ensuring ease of use through proper user-centered design and support mechanisms. By addressing effort expectancy, agencies can mitigate resistance and drive broader adoption.

Social Influence, as outlined by UTAUT, underscores the role of societal and organizational expectations in shaping individuals' decisions to adopt technology. In the Nigerian communications sector, this factor is particularly effectful, given the hierarchical nature of many organizations and the emphasis on directives from leadership. Studies like Rahi et al. (2022) have shown that managerial endorsement can significantly influence employee attitudes toward technology adoption. In the Nigerian context, where agencies are often guided by mandates from the Ministry of Communications, Innovation and Digital Economy, these endorsements play a central role in driving adoption efforts. Similarly, peer influence within teams fosters collective acceptance, as observed in studies like Kim et al. (2010). This dynamic is crucial in regulatory agencies where collaboration is key. By leveraging strong leadership advocacy and fostering a culture of peer support, Supervisory agencies in Nigeria can effectively utilize social influence to promote the adoption of critical digital technologies.

UTAUT provides valuable insights into overcoming implementation challenges, a key issue in Nigeria's communications sector. Resistance to technology adoption, often driven by fears of job redundancy, inadequate skills, or unfamiliarity with digital tools, can stall progress. By addressing constructs like Effort Expectancy and Facilitating Conditions, agencies can mitigate these barriers. For example, Al-Emran and Griffy-Brown (2023) demonstrated the importance of user-centered design and structured training programs in increasing adoption rates. Additionally, Lim et al. (2023) highlighted the role of gamified learning modules in making training more engaging and effective. In Nigeria, similar approaches could be adopted to address resistance and enhance user confidence. Supervisory agencies could also introduce policies emphasizing job security and career growth alongside technology adoption, thereby alleviating employee concerns. UTAUT's comprehensive approach offers a roadmap for systematically addressing and resolving these challenges, ensuring smoother transitions to digital systems.

UTAUT's predictive capabilities make it invaluable for evaluating the effectiveness of digital transformation policies in Nigeria's communications sector. By analyzing the constructs of Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions, researchers can identify the critical factors driving or hindering adoption. For example, Nigeria's National Digital Economy Policy and Strategy (NDEPS) aims to accelerate digital adoption across sectors. By applying

UTAUT, policymakers can assess how effectively these initiatives address user needs and adoption barriers. Studies like Sharma et al. (2022) and Huang et al. (2023) demonstrate how UTAUT can guide policy refinements, ensuring alignment with real-world user behaviours. In the Nigerian context, the model can also highlight gaps in training, infrastructure, or stakeholder engagement, enabling more targeted interventions. UTAUT thus serves as a practical tool for monitoring and enhancing the implementation of digital technology initiatives within regulatory agencies.

The application of UTAUT in the Nigerian communications sector reveals several practical implications for driving digital technology adoption. Supervisory agencies can use the framework to develop tailored strategies that address the unique needs and concerns of their workforce. For example, targeted training programs designed to improve digital literacy can address Effort Expectancy, while investments in infrastructure and technical support can strengthen Facilitating Conditions. Additionally, leadership advocacy and stakeholder engagement campaigns can leverage Social Influence to build a supportive culture around technology adoption. As studies by Ali et al. (2023) and Alotaibi et al. (2022) suggest, such interventions can significantly enhance adoption rates and improve organizational performance. By aligning implementation strategies with UTAUT's constructs, Nigeria's regulatory agencies can ensure a more effective and inclusive digital transformation process. UTAUT's versatility makes it a valuable framework for addressing future challenges in Nigeria's communications sector. The introduction of UTAUT2 by Venkatesh et al. (2016), with additional constructs like Hedonic Motivation and Habit, further broadens its applicability to emerging technologies. For instance, the adoption of AI and IoT tools in Nigeria could benefit from incorporating factors like user enjoyment and affordability, as highlighted by Lim et al. (2023). Moreover, emerging issues like data privacy, cybersecurity, and ethical considerations, discussed by Sharma et al. (2022), could complement UTAUT's constructs to address contemporary challenges. Future research could also explore the integration of UTAUT with industry-specific factors, providing a more tailored approach to understanding adoption dynamics in Nigeria. By evolving with technological and contextual changes, UTAUT will remain a cornerstone for guiding digital transformation in the Nigerian communications sector.

UTAUT provides a comprehensive and adaptable framework for understanding the factors influencing digital technology adoption in Nigeria's communications sector. Its constructs address key elements such as performance improvement, ease of use, social dynamics, and organizational support, making it highly relevant to the sector's unique challenges. While its limitations suggest the need for complementary approaches, UTAUT remains a powerful tool for guiding effective implementation strategies and policy interventions. As digital technologies continue to evolve, integrating UTAUT with emerging constructs and contextual variables will ensure its ongoing relevance and utility in fostering technological advancements in Nigeria.

Empirical Review

Several studies have assessed the effect of digital technology adoption on organizational performance. Sonhaji et al. (2024) looked at the Surabaya City Office for Population Administration and Civil Registration (COPACR) in Indonesia's digital transformation process. The study uncovered internal and external barriers relevant to the COPACR sector's adoption of digital transformation using a mixed-method approach that includes qualitative and quantitative methodologies. Through focus group discussions (FGDs) with field officers and top management and an analysis of 20 literature sources, the researchers found 63 impediments, 33 of which were external and 30 of which were

internal. Priority barriers were established using the Analytic Hierarchy Process (AHP) approach and expert choice tools. Results indicated that internal and external obstacles, including strict legislation, inadequate funding, low workforce involvement, and officer competence, seriously impeded the digital transformation.

Muduli and Choudhury (2024) investigate the drivers of digital technology adoption and its effect on banking performance, emphasizing the role of workforce agility as a mediator. Guided by the Attitude–Behaviour–Outcome framework, survey data from high- and low-level executives in India's banking sector were analyzed using SPSS-AMOS and Hayes PROCESS macro. Findings reveal that bankers' digital technology acceptance significantly enhances performance. Workforce agility was shown to mediate positively between technology acceptance and outcomes. The study suggests implementing management practices that foster technology acceptance and workforce agility to improve customer relationships and overall performance, highlighting strategic pathways for optimizing digital adoption in banking.

Binsar et al. (2024) analyzed online reviews and search trends to evaluate digital adoption in Indonesia's public healthcare via the JKN mobile application. Sentiment analysis of reviews revealed predominantly negative feedback on issues like registration, login errors, and information accuracy, while positive reviews highlighted convenience for some users. Topics focused on basic functions, with little mention of new service modules. Google Trends indicated limited keyword variation, reflecting stagnant digital growth. Findings highlight technical flaws, data quality concerns, and lack of transparency in service expansion. The study demonstrates the utility of big data analytics for identifying improvement areas in public digital services.

Awawdeh et al. (2024) investigate the effect of service digitalization dimensions—comprising internet banking, mobile banking, and automated teller machines (ATMs)—on bank competitiveness in the financial services sector. Their study employs a Partial Least Squares Structural Equation Modeling (PLS-SEM) approach to analyze survey data from 118 banking employees. The findings reveal that internet banking and ATMs significantly enhance competitiveness, attributed to increased accessibility and operational efficiency. Mobile banking, while positively correlated, does not exhibit a statistically significant effect on competitiveness, potentially due to adoption challenges or user trust issues. This study underscores the importance of focusing on effective and secure digital systems for competitive advantage, offering implications for both bank regulators and managers to optimize these technologies. Murthy and Gopalkrishnan (2024) delve into the susceptibility of senior citizens to digital fraud in the context of digital banking. Their research highlights the emotional and cognitive vulnerabilities of senior users, emphasizing the role of fear and neuroticism in increasing their risk of fraud. Utilizing the OCEAN personality model, they identify emotional patterns that make senior citizens more susceptible to digital scams. This empirical investigation stresses the importance of behavioural interventions and regulatory safeguards to mitigate these risks. The findings contribute to the broader discourse on consumer protection and the psychological aspects of digital banking adoption.

Bertacchini et al. (2025) analyze the influence of digitalization on internal audit functions (IAFs) within Italian-listed companies, using institutional theory as a framework. Their qualitative study identifies key areas effected by digitalization, such as skill requirements, collaboration with external consultants, and the scope of internal auditing activities. The extent of digital adoption varies among organizations, influenced by institutional pressures and organizational priorities. The research

underscores the transformative role of digital technologies in enhancing the efficiency and scope of internal audits. This study provides practical implications for internal auditors and organizations aiming to adapt to the evolving digital landscape.

Putrevu and Mertzanis (2024) provide a comprehensive review of the adoption of digital payments in emerging economies, highlighting their benefits and challenges. The study identifies technological advancements, user acceptance, and infrastructure as critical factors for successful adoption. While digital payments enhance competitiveness and financial inclusion, the associated risks, such as data security and digital divide, necessitate robust policy responses. The authors advocate for responsible implementation and risk mitigation strategies, offering actionable recommendations for policymakers and service providers. Their findings emphasize the need for a holistic approach to foster a digital payments ecosystem that benefits all stakeholders.

Mer et al. (2024) review the role of artificial intelligence (AI) in banking and stock market trading, focusing on its transformative potential in financial analytics. The study identifies key applications of AI, such as fraud detection, customer profiling, and predictive analytics, which enhance operational efficiency and decision-making. However, it also highlights challenges, including ethical considerations, data privacy, and algorithmic biases. The authors suggest that integrating AI with human expertise can optimize outcomes in banking and trading. This study contributes to the growing body of literature on AI's role in financial services, offering insights for both practitioners and researchers.

Lee and Yeo (2024) investigated the relationship between ICT adoption, administrative discretion, and the innovative mindsets of South Korean public employees. Using moderated multiple regression analysis, they analyzed secondary survey data from the Korea Institute of Public Administration's 2021 study. The findings reveal that both ICT adoption and administrative discretion positively influence public employees' innovative mindsets. Additionally, perceptual administrative discretion moderates the relationship between ICT adoption and innovation, enhancing its effect. This study underscores the importance of empowering public employees through ICT tools and administrative autonomy to foster innovation within the public sector.

Sultana and Alam (2024) examine the integration of blockchain technology into the letter of credit (LC) system, a vital component in trade finance, with a focus on ten Asian countries. By comparing traditional and blockchain-enabled LCs, the study reveals that blockchain adoption offers substantial benefits such as enhanced efficiency, cost reduction, and improved security. However, challenges such as interoperability, scalability, and legal and administrative barriers remain prevalent. Additionally, the need for new technical skills and concerns over cybersecurity further complicate implementation. The research highlights the importance of regulatory sandboxes and collaborative approaches in overcoming these obstacles, as some countries have demonstrated promising efforts in these areas. By providing a comparative analysis, the study underscores the necessity for regional cooperation to establish a unified blockchain-enabled trade finance platform. The findings are valuable for policy formulation and advancing blockchain's role in sustainable trade practices, fostering regional economic integration.

Fang and Liu (2024) examined the effect of digital transformation on corporate digital technology innovation. Their findings indicate that digital transformation significantly boosts digital innovation,

with the results remaining consistent through various tests. The study reveals that digital transformation enhances core competitiveness, reduces financing constraints, improves internal control, and increases R&D investment, all of which drive digital technology innovation. Industry competition further strengthens this effect. The positive influence is most evident in firms located in eastern regions, technology-intensive industries, mature or declining firms, and state-owned enterprises. Additionally, digital transformation improves the quality of innovation and promotes collaborative digital innovation.

da Paixão et al. (2024) explore the relationship between the Govtech Maturity Index and the adoption of IPSAS (International Public Sector Accounting Standards) across 130 countries. Using secondary data from international organizations and a multiple linear regression analysis, the study finds that countries with higher Govtech maturity levels tend to adopt IPSAS more readily. The study also shows that regulatory quality, communication, and macroeconomic stability positively influence this relationship. The findings underscore the importance of strong governance and stable macroeconomic conditions in advancing digital transformation in the public sector and the adoption of international accounting standards.

Gaps in the Literature

The topic of digital technology adoption in supervisory agencies of the Nigerian communications sector is a rapidly evolving area, yet several key gaps in the literature remain unexplored. One of the most prominent gaps pertains to the specific application of the Unified Theory of Acceptance and Use of Technology (UTAUT) within this particular context. While numerous studies have applied the UTAUT model in various sectors globally, there is limited research that investigates the nuanced factors influencing the adoption of digital technology by government supervisory agencies within developing economies such as Nigeria. The UTAUT model, with its variables such as performance expectancy, effort expectancy, social influence, and facilitating conditions, offers a solid framework to understand the individual and organisational factors influencing technology adoption. However, studies specifically focusing on how these variables affect performance outcomes in the Nigerian communications sector are sparse, particularly when assessing Supervisory agencies' use of digital tools for supervisory functions (Venkatesh et al., 2016; Venkatesh, 2022; Davis, 2000).

Another critical gap exists in the application of the UTAUT model in the Nigerian context, particularly concerning the Supervisory agencies of the Nigerian communications sector. While several studies have explored technology adoption in different sectors, the communications supervisory agencies in Nigeria, including the National Communications Commission (NCC), have not been adequately studied. Literature concerning digital adoption in the Nigerian communications sector has primarily focused on private-sector companies and telecom service providers, leaving a significant gap in understanding the unique challenges and facilitating conditions faced by regulatory bodies. The existing studies often do not account for the organizational and sector-specific factors that influence the adoption of digital technologies by governmental or quasi-governmental institutions such as the NCC (Ajzen, 1991). This gap in the literature is critical for understanding how public institutions, specifically in the Nigerian context, interact with digital technologies.

European Journal of Business and Innovation Research, 14(2),1-25, 2026
Print ISSN: 2053-4019(Print)
Online ISSN: 2053-4027(Online)
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development -UK

METHODOLOGY

This study employs a quantitative research design with a cross-sectional survey approach .The population for this study consists of staff members from key supervisory agencies in Nigeria's communications sector. These agencies include the Nigerian Communications Commission (NCC), National Information Technology Development Agency (NITDA), Galaxy Backbone Limited, Nigerian Postal Service (NIPOST), National Data Protection Commission (NDPC), Nigerian Communications and Satellite Limited (NIGCOMSAT). The study targets permanent staff members from these agencies, as they are key stakeholders who possess valuable insights into how digital technologies influence service delivery efficiency.

Table 1 Population Distribution

S/No	Agencies	Population
1	NCC	1,035
2	NITDA	482
3	Galaxy Backbone Limited	506
4	NIPOST	9,776
5	NDPC	58
6	NIGCOMSAT	265
	Total	12,122

Source: Human Resource Department of the Respective Organisations (2025)

This study employs a multistage sampling technique to examine the factors influencing digital technology adoption and its effect on service delivery efficiency within Nigeria's communications sector. A hybrid sampling approach integrates stratified, purposive, and simple random sampling to ensure comprehensive coverage of various roles and perspectives within the sector. In the first stage, stratified sampling is utilised to categorise employees based on their functional roles across the seven key regulatory and supervisory agencies—NCC, NITDA, Galaxy Backbone Limited, NIPOST, NDPC and NIGCOMSAT. This stratification ensures that employees involved in regulatory oversight, digital infrastructure management, policy implementation, and operational activities are proportionally represented, capturing the diverse nature of digital technology adoption within the sector.

The sample size is the part of the population that was selected for the study. Krejcie & Morgan's (1970) sample size determination is handy since the population is above 10,000. The formula is presented as follows:

$$\frac{x^2\ N\ P\ (1-P)}{e^2(N-1)+x^2P(1-P)} \qquad (3.1)$$

x^2=Chi-Square; e=Margin of error; N=Population; P=Proportion of Population; N=12,122; P=0.5; e=0.05

At a 95% confidence level with one (1) degree of freedom, the chi-square x^2=3.841

$$\frac{3.841 * 12{,}122 * 0.5 * 0.5}{0.05^2 * (12{,}122 - 1) + (3.841 * 0.5 * 0.5)}$$

$$= \frac{11640.1505}{0.0025 * 12{,}122 + 0.96025} = \frac{11640.1505}{30.3025 + 0.96025}$$

$$\frac{11{,}640.1505}{31.26275} = 372.33 = 373\ approx$$

The sample size calculated for this study was 373.

Table 2 Sample Distribution

S/No	Agencies	Population	Sample
1	NCC	1035	$\frac{1035}{12{,}122} * 373 = 32$
2	NITDA	482	$\frac{482}{12{,}122} * 373 = 15$
3	Galaxy Backbone Limited	506	$\frac{506}{12{,}122} * 373 = 16$
4	NIPOST	9776	$\frac{9776}{12{,}122} * 373 = 301$
5	NDPC	58	$\frac{58}{12{,}122} * 373 = 2$
6	NIGCOMSAT	265	$\frac{265}{12{,}122} * 373 = 8$
	Total	12122	373

For the sample size of 373, the designated organisations were properly represented using the proportionality formula. Following administration of the questionnaire, a total of 413 responses were received.

Thus: $Q = \frac{A}{N} * n$ 3.2

Where:

Q = the number of the questionnaires allocated to each selected organization
A = the population of each selected organization
N = the total population of all selected organizations
n = the estimated sample size used in the study.

The study will utilize a structured questionnaire as the primary data collection instrument, targeting staff from key regulatory and supervisory agencies within Nigeria's communications sector. The model provides a comprehensive approach to understanding how digital technology adoption translates into improved service delivery outcomes. The Manrai, Goel and Yadav (2021) model is augmented as follows:

$$SDE_i = \beta_0 + \beta_1 PE_i + \beta_2 EE_i + \beta_3 SI_i + \mu_i$$

Where; SDE_i represent Service Delivery Efficiency; PE_i is Performance Expectancy; EE_i represents Effort Expectancy; SI_i stands for Social Influence; β_1 to β_3 are the parameters to be estimated; α_0 is the constant; μ_i is the error term

Therefore, this quantitative study employed multiple regression analysis and correlation to examine the relationships between the various variables in the research framework, as outlined by previous

studies such as Shamaki et al. (2022) and Yusuf et al. (2023). In the analysis, ordinary least squares (OLS) regression was applied to estimate the relationship between the independent variables and the dependent variable.

RESULTS AND DISCUSSIONS

Descriptive Statistics

Table 1 summarises responses from 413 officials across eight constructs measured on a five-point Likert scale. Central tendencies exceed the midpoint across all variables, indicating broadly favourable assessments of digital adoption and outcomes. Performance expectancy and service delivery post the highest means. Dispersion remains moderate overall, though facilitating conditions shows the widest spread. Minimum and maximum values span the full scale for several constructs, signalling heterogeneity across agencies and units. These descriptive results frame subsequent inferential tests by revealing where perceptions converge and where enabling factors remain uneven. Performance expectancy exhibits the strongest central tendency with a mean of 4.443 and the smallest variance among the antecedents. Its distribution is markedly left skewed, with skewness at −1.988 and kurtosis at 7.945, which implies clustering near the upper bound and a pronounced peak. Such concentration suggests that respondents widely believe digital systems improve task execution, decision quality, and throughput. The limited dispersion may dampen marginal correlations in linear models. However, the consistently high levels of perceived usefulness should translate into substantial direct and indirect effects on intention and service delivery.

Table 1: Descriptive Statistics

Statistics	PE	EE	SI
N	413	413	413
Range	3.6	3.2	3.0
Minimum	1.4	1.8	2.0
Maximum	5.0	5.0	5.0
Sum	724.2	641.0	661.4
Mean	4.443	3.933	4.058
Std. Dev.	0.564	0.652	0.570
Variance	0.318	0.425	0.324
Skewness	-1.988	-0.689	-0.799
Kurtosis	7.945	0.796	1.127

Source: Author's Computation (2025)

Effort expectancy and social influence form a mid-tier cluster with means near four and moderate dispersion. Effort expectancy at 3.933 suggests that interfaces and processes are manageable for most staff, although pockets of difficulty persist. Social influence at 4.058 implies supportive managerial cues and favourable peer norms that encourage uptake. Service delivery records a mean of 4.245 with negative skewness and high kurtosis, which indicates that many respondents perceive strong efficiency gains but a minority still experience weak outcomes. The full observed range underscores pockets where processes remain slow or unreliable. Given the high averages for performance expectancy this weaker case is unlikely to be motivational. Segmenting results by agency, location, or unit will help identify the specific bottlenecks that depress efficiency in otherwise supportive adoption environments. The distributional diagnostics carry methodological and managerial consequences.

Strong negative skewness and leptokurtosis for performance expectancy and service delivery suggest potential ceiling effects that could compress linear associations.

Correlation Results

Across the constructs, the matrix shows consistently positive and mostly moderate associations, with all relationships significant at the 0.01 level. For service delivery, the strongest bivariate correlates are performance expectancy at 0.504, social influence at 0.485 and effort expectancy at 0.331. This rank order suggests that trust in systems, willingness to use, and routinised practice are more closely tied to efficiency outcomes than ease of use alone, while infrastructure and social cues exert meaningful secondary influence. Social influence at 0.517, and performance expectancy at 0.433, this indicates that confidence in reliability, security, and data integrity operates as a linchpin across the adoption environment. Where systems are trusted, users are more likely to develop stable routines, perceive higher usefulness, and experience smoother operations. Programme implications are clear: investments in security governance, auditability, incident response, and transparent communication about safeguards are likely to yield sizeable improvements in observable service outcomes.

Table 2: Correlation Results

Variables	PE	EE	SI
PE	1	0.404**	0.597**
EE	0.404**	1	0.219**
SI	0.597**	0.219**	1
SD	0.504**	0.331**	0.485**

Source: Author's Computation (2025)

Performance expectancy correlates moderately with service delivery at 0.504 and shows strong alignment with social influence at 0.597. Staff who believe digital tools enhance results also tend to report supportive norms and adequate trust. Social influence is associated with service delivery at 0.485 and demonstrates substantial relationships with performance expectancy at 0.597. These patterns suggest that leadership signals, peer expectations, and sectoral standards not only encourage uptake but also diffuse perceptions of usefulness and trust, which, in turn, support routine use. Visible sponsorship by senior management, recognition for digital proficiency, and cross-agency communities of practice can strengthen these normative pressures. When such social cues align with credible systems and workable processes, they reinforce the collective momentum required to sustain adoption and lift operational performance across directorates. Effort expectancy shows the weakest direct association with service delivery at 0.331. The profile implies that ease of use contributes to performance mainly through indirect pathways that cultivate intention and routine practice. Usability enhancements, role-tailored interfaces, and concise task aids are therefore likely to amplify downstream effects rather than drive large bivariate gains on their own. Given the intercorrelations among antecedents, multicollinearity checks and mediation models are appropriate, allowing the analysis to partition overlapping variance and estimate the distinct contributions of each driver to delivery outcomes. For programme design, the priorities are clear: strengthen security and reliability practices, institutionalise digital routines, maintain visible leadership advocacy, and remediate uneven conditions. Such an integrated approach should consolidate gains and produce durable improvements in regulatory service efficiency.

Test of Hypotheses

This subsection presents the formal tests of the study's hypotheses on the effects of digital technology adoption drivers on service delivery efficiency in supervisory agencies of Nigeria's communications sector. The dependent variable is service delivery efficiency. The predictors are performance expectancy, effort expectancy and social influence. Estimation relies on multiple regression for direct effects and regression-based mediation with bootstrap confidence intervals for indirect effects. Inference follows a two-tailed α of 0.05. Model adequacy is judged using R-square, adjusted R-square, the Durbin–Watson statistic, residual diagnostics, and variance inflation factors. The model explains a substantial share of variation in service delivery. The R-square of 0.601 indicates that the predictors jointly account for 60.1 percent of the observed differences, while the adjusted R-square of 0.583 corrects for model complexity and confirms a strong fit for cross-sectional organisational data. The Durbin Watson statistic of 1.901 is near the ideal value of 2, which suggests that residuals are not serially correlated and that inference from the standard errors is dependable. Collinearity is modest, as all VIF values remain below 2.5.

Table 3: Regression on the Effect of Digital Technology Adoption on the Performance of Supervisory Agencies of the Nigerian Communications Sector

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-0.209	0.334		-0.625	0.533		
PE	0.194	0.080	0.167	2.429	0.016	0.544	1.839
EE	-0.056	0.064	-0.056	-0.879	0.381	0.643	1.554
SI	0.005	0.081	0.004	0.057	0.955	0.520	1.922
R-Square	0.601	Adjusted R-Square		0.583	Durbin Watson		1.901

a. Dependent Variable: SD-Service Delivery
b. Independent Variable: PE-Performance Expectation, EE-Effort Expectancy, SI-Social Influence,
Source: Author's Computation (2025)

Hypothesis One (H_{O1}): There is no significant impact of performance expectancy on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector.

Performance expectancy exerts a positive and statistically significant influence on service delivery when other factors are controlled. The unstandardised coefficient is 0.194 and the standardised beta is 0.167, with t equal to 2.429 and p equal to 0.016. This magnitude is modest yet meaningful in managerial terms. Tolerance of 0.544 and VIF of 1.839 show acceptable overlap with other predictors. Strengthening the salience of demonstrable benefits through dashboards, case exemplars, and feedback loops should therefore translate into incremental efficiency gains. Therefore, the first Hypothesis (H_{O1}): There is no significant impact of performance expectancy on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector is hereby rejected.

The positive and significant coefficient for performance expectancy confirms that perceived usefulness is associated with higher service delivery efficiency after controls, which aligns with the core UTAUT claim that usefulness beliefs are proximal to intention and outcomes in organisational settings (Venkatesh et al., 2003). Evidence from e-government and regulated sectors similarly links clearly

demonstrated benefits to measurable efficiency and quality gains (Acquah et al., 2024; Almehairbi, Jano, & Mosali, 2022). Studies of digital transformation in firms report productivity and competitiveness improvements when digital tools are framed around task performance and reinforced with feedback on results (Huang, Xu, Xue, & Zhu, 2023). Research on diversified digital adoption also shows that aligning adoption with performance-enhancing use cases strengthens innovation and operational payoffs (Cheng et al., 2023). The present finding therefore concurs with the literature that visibility of benefits, communicated through dashboards and exemplars, helps convert favourable beliefs into consistent, high-throughput execution (Venkatesh, 2022; Acquah et al., 2024; Almehairbi et al., 2022; Huang et al., 2023; Cheng et al., 2023).

Hypothesis Two (H_{O2}): There is no significant impact of effort expectancy on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector.
Effort expectancy is not a significant predictor in the multivariate setting. The coefficient is negative and small, B equal to −0.056 with beta equal to −0.056, t equal to −0.879, and p equal to 0.381, while VIF is 1.554. The second hypothesis **(H_{O2}):** There is no significant impact of effort expectancy on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector is accepted.

The non-significant direct effect of effort expectancy accords with studies where ease of use acts mainly upstream by shaping intention, learning curves, and routine formation rather than directly lifting outcomes in multivariate models (Chiu & Yang, 2019). Investigations in process industries and public organisations frequently report that usability gains manifest through adoption depth and reduced training burden, with limited standalone effects on performance after controls (Blichfeldt & Faullant, 2021; Lee & Yeo, 2024). Empirical work in manufacturing and services likewise suggests that usability contributes indirectly through intention and capability pathways captured elsewhere in the model (Almehairbi et al., 2022; Dwivedi et al., 2023). The present result therefore broadly aligns with this stream, while leaving open the possibility that targeted usability improvements strengthen intention and habit, which then transmit benefits to delivery (Chiu & Yang, 2019; Blichfeldt & Faullant, 2021; Lee & Yeo, 2024; Almehairbi et al., 2022; Dwivedi et al., 2023).

Hypothesis Three (H_{O3}): There is no significant impact of social influence on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector.
Social influence also lacks a distinct direct effect. The coefficient is essentially null, B equal to 0.005 with beta equal to 0.004, t equal to 0.057, and p equal to 0.955, with VIF of 1.922. Aligning social cues with credible, reliable systems and with process redesign will be necessary to convert encouragement into measurable operational performance. Thus, the third hypothesis (H_{O3}): There is no significant impact of social influence on the service delivery efficiency of Supervisory Agencies of the Nigerian Communications Sector is accepted.

The absence of a distinct direct effect for social influence is consistent with public sector studies that locate social and leadership cues upstream of intention and trust, rather than as independent drivers of delivery once credibility and motivation are modelled (David et al., 2023; Nguyen et al., 2023). Work on social media and digital government adoption similarly finds that advocacy and norms raise adoption propensity but do not reliably predict operational outcomes when system qualities and user beliefs are accounted for (Atique et al., 2021; Hyytinen, Tuimala, & Hammar, 2022). At the macro level, diffusion research shows social and institutional environments shaping readiness, with economic

results contingent on capability and governance factors captured by other constructs (Park & Choi, 2019). The present finding therefore aligns with the literature that values sponsorship and peer effects for culture building while emphasising that credible systems and process redesign anchor measurable performance gains (David et al., 2023; Nguyen et al., 2023; Atique et al., 2021; Hyytinen et al., 2022; Park & Choi, 2019).

CONCLUSION AND RECOMMENDATIONS

This study set out to evaluate how digital technology adoption affects the performance of supervisory agencies in Nigeria's communications sector. Performance expectancy has a positive and statistically significant effect on service delivery efficiency. Staff who believe that the relevant digital tools improve task execution report better timeliness, accuracy, and throughput. The magnitude is modest, yet it remains operationally important because it compounds across many routine transactions. Management should therefore keep benefits visible at the task level, using dashboards, before-and-after process measures, and structured feedback loops. When users can see concrete improvements, they are more likely to persist with the systems and to anchor their daily work in digital workflows that are auditable and replicable.

Effort expectancy does not display a unique direct effect once other drivers are held constant. Ease of use appears to work upstream by shaping intention, shortening learning curves, and supporting the formation of stable routines. The implication is not to downplay usability, but to pair interface refinement with measures that encourage persistent use. Clear task aids, role-tailored screens, and concise onboarding will still yield returns, chiefly through higher intention and faster proficiency. In practice, the largest gains will occur when usability work is aligned with credible systems and embedded processes that reduce the need for workarounds.

Social influence does not show a distinct effect after controls. Leadership signals and peer norms help build readiness and shape expectations, but their impact on delivery depends on the quality and credibility of the systems and on the presence of clear processes. Visible sponsorship should therefore be retained, yet anchored in demonstrably reliable tools and in redesigned workflows that remove redundant manual steps. Recognition for disciplined digital practice and communities of practice can sustain momentum, provided they are tied to measurable service standards and supported by dependable platforms.

Based on the outcome of the results, the following recommendations are outlined:

(i) The analysis shows that performance expectancy exerts a positive and statistically significant effect on service delivery efficiency. Staff who are convinced that digital systems improve task execution report better timeliness, accuracy, and throughput. This result satisfies the first objective and warrants rejection of H01. In practical terms, supervisory agencies should continue to foreground demonstrable gains, for example through task dashboards, before and after process metrics, and structured feedback to users. When perceived usefulness is made visible at the point of work, adoption deepens and performance improvements accumulate across routine regulatory activities.

(ii) Effort expectancy does not display an independent effect once other drivers are considered. The second objective is therefore concluded with retention of H02. Ease of use remains

important, but its influence is expressed indirectly through stronger intention and faster proficiency rather than through a distinct contribution to delivery outcomes in the full model. Agencies should pair interface simplification and clear task aids with measures that stabilise use, including concise onboarding and role tailored support, so that usability gains travel through intention and habit into consistent performance.

(iii) Social influence lacks a distinct direct association with service delivery after controlling for credibility, intention, and related factors. The third objective is concluded with retention of H03. Leadership advocacy and peer norms are still valuable for building readiness and reinforcing desired behaviours, but they must be anchored in dependable systems and streamlined procedures to translate into measurable gains. Programmes that recognise disciplined digital practice and maintain communities of practice should be tied to verified improvements in service standards to sustain traction.

REFERENCES

Abdelhakim, M., Abdeldayem, M. M., & Aldulaimi, S. H. (2022). Information Technology Adoption Barriers in Public Sector. *2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS)*, 355–360.

Abbas, A., & Mehmood, K. (2021). Understanding Digital Marketing Adoption in India: Integrated by Technology Acceptance Model (TAM) and Theory of Planned Behaviour (TPB) Framework, Journal of Management Sciences, 8 (2), 70-87

Abdullahi, M., & Abdullah, N. L. (2024). Determinants of intention to adopt the Nigerian digital currency, the eNaira, for financial transactions in Abuja, Nigeria. *Journal of Governance and Integrity*, *7*(2), 762-769.

Acquah, A., Agyabeng, A. N., & Mensah, J. K. (2024). Digital transformation and implications for the informal sector of Ghana. In *Informal Economy and Sustainable Development Goals: Ideas, Interventions and Challenges* (pp. 29-51). Emerald Publishing Limited.

Afrizal, D., Luthfi, A., Wallang, M. B., Hildawati, H., & Ekareesakul, K. (2024). Citizens' Intention to Use E-Government Services in Local Government by Integrating UTAUT, TPB, and TAM Model. *Journal of Local Government Issues*, *7*(2), 129-143.

Agudo-Peregrina, Á. F., Hernández-García, Á., & Pascual-Miguel, F. J. (2014). Behavioural intention, use behaviour and the acceptance of electronic learning systems: Differences between higher education and lifelong learning. *Computers in Human Behaviour*, *34*, 301-314.

Ahmed, R. R., Akbar, W., Aijaz, M., Channar, Z. A., Ahmed, F., & Parmar, V. (2023). The role of green innovation on environmental and organizational performance: Moderation of human resource practices and management commitment. *Heliyon*, *9*(1).

Ajayi, O. A., & Adebayo, A. (2023). The Persistent Incidence of Gender Inequality and Child Marriage in Nigeria. *Rev. Universitara Sociologie*, 272.Ajzen, I. (1991). The Theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Englewood Cliffs, NJ: Prentice-Hall.

Al-Emran, M., & Griffy-Brown, C. (2023). The role of technology adoption in sustainable development: Overview, opportunities, challenges, and future research agendas. *Technology in Society, 73,* 102240. https://doi.org/10.1016/j.techsoc.2023.102240.

Almehairbi, K. M. S. S., Jano, Z., & Mosali, N. A. (2022). Structural relationship of technology adoption and performance factors in UAE manufacturing industry. *International Journal of Sustainable Construction Engineering and Technology*, *13*(4), 320-337.

Ali, J. K. M., Shamsan, M. A. A., Hezam, T. A., & Mohammed, A. A. (2023). Effect of ChatGPT on learning motivation: teachers and students' voices. *Journal of English Studies in Arabia Felix*, *2*(1), 41-49.

Alotaibi, M. S., Fox, M., Coman, R., Ratan, Z. A., & Hosseinzadeh, H. (2022). Smartphone addiction prevalence and its association on academic performance, physical health, and mental well-being among university students in Umm Al-Qura University (UQU), Saudi Arabia. *International journal of environmental research and public health*, *19*(6), 3710.

Atique, M., Htay, S. S., Mumtaz, M., Khan, N. U., & Altalbe, A. (2024). An analysis of E-governance in Pakistan from the lens of the Chinese governance model. *Heliyon*, *10*(5).

Awawdeh, A., Al-Hiyari, A., & Ismail, A. I. (2024). *Service Digitalization Dimensions and Banks Competitiveness: An Institutional-Focused PLS-SEM Approach* (pp. 97–106). https://doi.org/10.1108/S1479-351220240000036009.

Batubara, F. R., Ubacht, J., & Janssen, M. (2018). Challenges of blockchain technology adoption for e-government. *Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age*, 1–9. https://doi.org/10.1145/3209281.3209317

Bertacchini, F., Gabrielli, G., Lugli, E. *(2025).* From bits to profits: exploring the digitalization-performance nexus. *Review of Management Science*. https://doi.org/10.1007/s11846-025-00928-4

Bello, O. A., Folorunso, A., Onwuchekwa, J., Ejiofor, O. E., Budale, F. Z., & Egwuonwu, M. N. (2023). Analysing the impact of advanced analytics on fraud detection: a machine learning perspective. *European Journal of Computer Science and Information Technology*, *11*(6), 103-126.

Binsar, F., Mursitama, T. N., Hamsal, M., & Rahim, R. K. (2024). Assessing Digital Adoption Capability in Public Healthcare Services Through Online User Reviews and Popularity Trends. *Journal of System and Management Sciences*, *14*(7), 353-376.

Bjerke-Busch, L.S., Aspelund, A. (2021). Identifying barriers for digital transformation in the public sector. In: Schallmo, D.R.A., Tidd, J. (eds) Digitalization. *Management for Professionals*. Springer, Cham. https://doi.org/10.1007/978-3-030-69380-0_15.

Blichfeldt, H., & Faullant, R. (2021). Performance effects of digital technology adoption and product & amp; service innovation – A process-industry perspective. *Technovation*, *105*, 102275. https://doi.org/10.1016/j.technovation.2021.102275.

Bwalya, A., Rutegwa, M., Tukahabwa, D., & Mapulanga, T. (2023). Enhancing Pre-Service Biology Teachers' Technological Pedagogical Content Knowledge through a TPACK-Based Technology Integration Course. *Journal of Baltic Science Education*, *22*(6), 956-973.

Cheng, C., Zhang, M., Dai, J., & Yang, Z. (2024). When Does Digital Technology Adoption Enhance Firms' Sustainable Innovation Performance? A Configurational Analysis in China. *IEEE Transactions on Engineering Management*, *71*, 1555–1568. https://doi.org/10.1109/TEM.2023.3333373

Chiu, C.-N., & Yang, C.-L. (2019). Competitive advantage and simultaneous mutual influences between information technology adoption and service innovation: Moderating effects of environmental factors. *Structural Change and Economic Dynamics*, *49*, 192–205. https://doi.org/10.1016/j.strueco.2018.09.005

Chukwunonso, E. B. (2025). Effect of Google Classroom on Mathematics Achievement among Junior Secondary School Students in Enugu State, Nigeria. *Journal of Education, Communication, and Digital Humanities*, *2*(1), 167-178.

da Paixão, F. S., da Silva, D. J. C., de Melo, J. B., Dias, H. B. G., & da Costa Neto, A. M. (2024). IPSAS adoption and digital transformation in the public sector: Evidence from world economies. Boletim de Conjuntura (BOCA, 17(50), 351-367. https://doi.org/10.5281/zenodo.10699383

David, A., Yigitcanlar, T., Li, R. Y. M., Corchado, J. M., Cheong, P. H., Mossberger, K., & Mehmood, R. (2023). Understanding Local Government Digital Technology Adoption Strategies: A PRISMA Review. *Sustainability*, *15*(12), 9645. https://doi.org/10.3390/su15129645.

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.

Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J., Balakrishnan, J., ... & Wirtz, J. (2023). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology & Marketing*, *40*(4), 750-776.

Ejemeyovwi, J. O., Osabuohien, E. S., & Bowale, E. I. (2021). ICT adoption, innovation and financial development in a digital world: empirical analysis from Africa. *Transnational Corporations Review*, *13*(1), 16-31.

Fang, X., & Liu, M. (2024). How does the digital transformation drive digital technology innovation of enterprises? Evidence from enterprise's digital patents. *Technological Forecasting and Social Change, 204*, 123428. https://doi.org/10.1016/j.techfore.2024.123428.

Gholami, R., Singh, N., Agrawal, P., Espinosa, K., & Bamufleh, D. (2021). Information Technology/Systems Adoption in the Public Sector. *Journal of Global Information Management*, *29*(4), 172–194. https://doi.org/10.4018/JGIM.20210701.oa8

Huang, Q., Xu, C., Xue, X., & Zhu, H. (2023). Can digital innovation improve firm performance: Evidence from digital patents of Chinese listed firms. *International Review of Financial Analysis*, *89*, 102810.

Hyytinen, A., Tuimala, J., & Hammar, M. (2022). Enhancing the adoption of digital public services: Evidence from a large-scale field experiment. *Government Information Quarterly*, *39*(3), 101687.

Ibrahim, I., Mohammed, A., Abdulaali, H. S., & Ali, K. (2023). A bibliometric analysis of electronic human resource management e-hrm in scopus database. *International Journal of Professional Business Review*, *8*(8), e02407-e02407.

Ifinedo, P., Pyke, J., & Anwar, A. (2018). Business undergraduates' perceived use outcomes of Moodle in a blended learning environment: The roles of usability factors and external support. *Telematics and Informatics*, *35*(1), 93-102.

Igbokwe-Ibeto, C. J. (2019). Nigeria public service and the dilemma of good governance: examining the normative and empirical challenges. *Africa's Public Service Delivery and Performance Review* 7(1), a322. https://www.researchgate.net/publication/369071235

Joshi, H., & Chawla, D. (2023). Identifying unobserved heterogeneity in mobile wallet adoption–A FIMIX-PLS approach for user segmentation. *International Journal of Bank Marketing*, *41*(1), 210-236.

Kapoor, A., Guhathakurta, D., Mathur, M., Yadav, R., Gupta, M., & Kumaraguru, P. (2022, April). Tweetboost: Influence of social media on nft valuation. In *Companion Proceedings of the Web Conference 2022* (pp. 621-629).

Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in human behaviour*, *26*(3), 310-322.

Kim, H., & Park, M. (2023). Virtual influencers' attractiveness effect on purchase intention: A moderated mediation model of the Product–Endorser fit with the brand. *Computers in Human Behaviour*, *143*, 107703.

Krejcie, D., & dan Morgan, R. V. (1970). Menentukan ukuran sampel untuk kegiatan penelitian. *Pengukuran Pendidikan dan Psikologis*.

Kruse, C., & Heinemann, K. (2022). Facilitators and barriers to the adoption of telemedicine during the first year of COVID-19: systematic review. *Journal of Medical Internet Research*, *24*(1), e31752. doi:10.2196/31752.

Lee, J., & Yeo, R. K. (2024). Artificial intelligence and human integration: a conceptual exploration of its influence on work processes and workplace learning. *Human Resource Development International*, 1-21.

Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., & Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. *The international journal of management education*, *21*(2), 100790.

Manrai, R., Goel, U., & Yadav, P. D. (2021). Factors affecting adoption of digital payments by semi-rural Indian women: extension of UTAUT-2 with self-determination theory and perceived credibility. *Aslib Journal of Information Management*, *73*(6), 814–838. https://doi.org/10.1108/AJIM-12-2020-0396.

Martínez-Peláez, R.; Ochoa-Brust, A.; Rivera, S.; Félix, V. G.; Ostos, R.; Brito, H.; Félix, R. A.; Mena, L. J. (2023). Role of digital transformation for achieving sustainability: mediated role of stakeholders, key capabilities, and technology. *Sustainability*, 15, 11221. https://doi.org/10.3390/su151411221.

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Information technology and organizational performance: An integrative model of IT business value. *MIS quarterly*, 283-322.

Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent social sciences*, *5*(1), 1653531.

Mer, A., Singhal, K., & Virdi, A. S. (2024). A Review of the Role of Artificial Intelligence in Banking and Stock Market Trading. In *Finance Analytics in Business* (pp. 175–198). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83753-572-920241009.

Murthy, N., & Gopalkrishnan, S. (2024). Exploiting fear and vulnerabilities of senior citizens: are regulatory changes required to prevent digital frauds? *Working with Older People*, *28*(1), 84–95. https://doi.org/10.1108/WWOP-06-2023-0021

Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B. P. T. (2023). Ethical principles for artificial intelligence in education. *Education and Information Technologies*, *28*(4), 4221-4241.

Obi et al. (2022)

Ogunode, N. J., Abdulrazak, A., & Abubakar, J. A. (2023). Digitalization of Educational Institutions in Nigeria: Benefits, Problems and Solutions. *World of Semantics: Journal of Philosophy and Linguistics*, *1*(1), 12-24.

Otia, J. E., & Bracci, E. (2022). Digital transformation and the public sector auditing: The SAI's perspective. *Financial Accountability & Management*, *38*(2), 252-280.

Park & Choi, 2019

Putrevu, J., & Mertzanis, C. (2024b). The adoption of digital payments in emerging economies: challenges and policy responses. *Digital Policy, Regulation and Governance*, *26*(5), 476–500. https://doi.org/10.1108/DPRG-06-2023-0077.

Rahi, S., Alghizzawi, M., Ahmad, S., Munawar Khan, M., & Ngah, A. H. (2022). Does employee readiness to change effect organization change implementation? Empirical evidence from emerging economy. *International Journal of Ethics and Systems*, *38*(2), 235-253.

Rahman, A., & Khan, M. A. (2024). The relationship between financial development and economic growth: New insights using quadruple and quintuple helix innovation framework and way forward. *Journal of the Knowledge Economy*, *15*(2), 5939-5964.

Riffai, M. M. M. A., Grant, K., & Edgar, D. (2012). Big TAM in Oman: Exploring the promise of on-line banking, its adoption by customers and the challenges of banking in Oman. *International journal of information management*, *32*(3), 239-250.

Samsor, S. (2020). Challenges and barriers to e-Government implementation in developing countries: A case study of Afghanistan. *Journal of Information Technology and Development*, 15(3), 321-335.

Shamaki H., Ibrahim U. A., & Azu, N. P. (2022). Evaluating the influence of digital technology on the performance of female-owned enterprises in Nigeria. *Journal of Women's Entrepreneurship and Education,* No. 1-2, 39-60 DOI: 10.28934/jwee22.12.pp39-60

Sharma, G. D., Kraus, S., Srivastava, M., Chopra, R., & Kallmuenzer, A. (2022). The changing role of innovation for crisis management in times of COVID-19: An integrative literature review. *Journal of Innovation & Knowledge*, *7*(4), 100281.

Sonhaji, A. I., Anityasari, M., & Mahendrawathi, E. R. (2024). Identifying barriers in public sector digital transformation: A case study in Indonesia city office for population administration and civil registration (COPACR) context. *International Journal of Professional Business Review*, 9(4), e04500. https://doi.org/10.26668/businessreview/2024.v9i4.4500.

Sultana, A., & Alam, S. (2024). Adaptation of Blockchain Technology into the Letter of Credit (LC) Arrangement: An Overview of the Sustainable Business Practice in Asia. In *Green Management: A New Paradigm in the World of Business* (pp. 303–337). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83797-442-920241017.

Sultana, J., Kibria, M. G., & Teoh, S. Y. (2024). Understanding the e-government adoption behaviour in a developing country: a case of Bangladesh. *Electronic Government, an International Journal*, *20*(2), 139-160.

Tangi, L., Janssen, M., Benedetti, M., & Noci, G. (2020). Barriers and drivers of digital transformation in public organizations: Results from a survey in the Netherlands. In *Electronic Government: 19th IFIP WG 8.5 International Conference, EGOV 2020, Linköping, Sweden, August 31–September 2, 2020, Proceedings 19* (pp. 42-56). Springer International Publishing.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, *46*(2), 186-204.

Venkatesh, V. (2022). Adoption and use of AI tools: a research agenda grounded in UTAUT. *Annals of operations research*, *308*(1), 641-652.

Venkatesh, V., Thong, J. Y., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the association for Information Systems*, *17*(5), 328-376.

Warrick, D.D. (2023). Revisiting resistance to change and how to manage it: What has been learned and what organizations need to do. *Business Horizons,* 66(4), 433-441, https://doi.org/10.1016/j.bushor.2022.09.001 (Warrick, 2023.

Yusuf, M., Satia, M. R., Bernardianto, R. B., Nurhasanah, N. I., Kurniasih, D., & Setyoko, P. I. (2023). Exploring The Role of Digital Leadership and Digital Transformation on The Performance of The Public Sector Organizations. *International Journal of Data and Network Science*, *7(4)*. pp. 1983-1990. ISSN 2561-8156. DOI:10.26668/businessreview/2023.v8i6.2751.

Zhang, S., Dong, L., Li, X., Zhang, S., Sun, X., Wang, S., ... & Wang, G. (2023). Instruction tuning for large language models: A survey. *arXiv preprint arXiv:2308.10792*.

Zheng, Y., Yu, Q., Lin, Y., Zhou, Y., Lan, L., Yang, S., & Wu, J. (2022). Global burden and trends of sexually transmitted infections from 1990 to 2019: an observational trend study. *The Lancet Infectious Diseases*, *22*(4), 541-551.

Zulkifli, M. (2024). Analyzing and critical review of "Adoption of ICT in a government organization in a developing country: an empirical study". *South East Asia J Contemp Bus Econ Law*, *32*(1), 78-84.