

Artificial Intelligence Adoption and Digital Governance as Determinants of Public Administration Performance: A Case Study of Selected Federal and State Public Institutions in Nigeria

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Abstract *The rapid advancement of Artificial Intelligence (AI) and digital governance technologies has transformed public administration by enhancing efficiency, transparency, accountability, and service delivery. This study examined the impact of AI adoption and digital governance on public administration performance using a quantitative research approach. Data were collected from 386 respondents comprising public servants, ICT administrators, policymakers, and service users through structured questionnaires. Descriptive statistics, Pearson correlation analysis, multiple regression, and Structural Equation Modeling (SEM) were employed for data analysis. The findings revealed a high level of AI utilization among respondents and positive perceptions of digital governance implementation. Correlation analysis showed significant positive relationships among AI adoption, digital governance, administrative efficiency, transparency, accountability, service delivery, and citizen satisfaction. Regression results indicated that AI adoption and digital governance jointly explained 68.7% of the variation in public administration performance, with AI adoption exerting the strongest influence. SEM results further demonstrated that AI adoption significantly improved administrative efficiency and transparency, while digital governance enhanced accountability. Administrative efficiency positively influenced service delivery, which subsequently increased citizen satisfaction. The study concludes that AI-enabled digital governance is a strategic tool*

for modernizing public administration and improving governance outcomes. The study recommends increased investment in digital infrastructure, capacity building, AI governance frameworks, and institutional reforms to maximize the benefits of intelligent public administration systems.

Keywords: *Artificial Intelligence, Digital Governance, E-Governance, Administrative Efficiency, Service Delivery.*

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1.0 Introduction

The increasing complexity of governance in the digital era has compelled governments worldwide to adopt innovative technological solutions aimed at improving public administration and service delivery. Information and Communication Technology (ICT), e-governance, and more recently, Artificial Intelligence (AI) have emerged as transformative instruments for modernizing government operations, enhancing citizen engagement, improving transparency, and increasing administrative efficiency. The traditional public administration model, characterized by extensive paperwork, hierarchical bureaucracy, lengthy decision-making processes, and limited public

participation, has proven inadequate for addressing the growing demands of contemporary societies. Consequently, digital transformation has become a strategic priority for governments seeking to achieve efficient, transparent, accountable, and citizen-centered governance systems.

Digital governance, often referred to as e-governance or e-government, involves the application of ICTs to improve interactions among government agencies, citizens, businesses, and other stakeholders. It encompasses the digitalization of administrative procedures, automation of workflows, electronic record management, online service delivery, and data-driven decision-making. According to Isah and Rufa'i (2026), e-government enables governments to provide information and services more efficiently through web-based platforms while simultaneously enhancing citizen participation in democratic processes. Similarly, Mohiuddin and Chowdhury (2026) describe e-governance as a revolutionary mechanism that improves productivity, transparency, accountability, and participatory governance through the strategic utilization of digital technologies.

The adoption of ICT and digital governance systems has generated significant improvements in administrative performance across different institutional contexts. Abubakari et al. (2023) reported that ICT deployment in administrative functions at Tamale Technical University significantly improved efficiency and effectiveness in institutional operations. Their study demonstrated that digital technologies facilitate information processing, communication, coordination, and resource management, thereby enhancing organizational productivity. Likewise, Dike (2019) argued that e-governance promotes participatory, transparent, responsive, and inclusive governance systems that contribute substantially to administrative efficiency. The

study further emphasized that ICT-enabled communication platforms strengthen interactions between governments and citizens while facilitating effective feedback mechanisms.

In public institutions, digital governance has increasingly become a critical driver of organizational transformation and performance improvement. Onwukwe et al. (2026) found that e-governance significantly enhances workflow optimization, service delivery speed, employee productivity, accountability, and record accessibility within Nigerian public institutions. The study demonstrated that digital office systems reduce processing time and eliminate bureaucratic bottlenecks that traditionally impede administrative performance. Similarly, Adeku et al. (2026) observed that ICT-driven governance systems improve efficiency, effectiveness, transparency, and responsiveness within public service institutions while simultaneously reducing governance costs. Their findings indicate that digital technologies are essential tools for achieving efficient and citizen-oriented public administration.

The role of digital governance extends beyond administrative efficiency to encompass broader governance outcomes such as transparency, accountability, and anti-corruption. Mudey et al. (2026), in a systematic review of forty-five empirical studies, reported that e-government systems reduce corruption by promoting transparency, automating procedures, standardizing processes, and minimizing opportunities for discretionary human intervention. The study concluded that digital governance can strengthen public integrity when supported by strong institutions and inclusive implementation frameworks. Supporting this position, Erinaldi et al. (2026) found that digitalization enhances transparency and accountability by improving information accessibility, simplifying bureaucratic procedures, and optimizing resource



utilization. These findings suggest that digital governance reforms not only improve operational efficiency but also contribute significantly to good governance and public trust.

The public value generated through digital governance has been extensively documented in the literature. Twizeyimana and Andersson (2019) identified six major dimensions of public value associated with e-government implementation, including improved public services, enhanced administrative efficiency, strengthened open-government capabilities, improved ethical behavior and professionalism, increased public trust, and enhanced social well-being. Their review further revealed that digital governance creates multidimensional benefits that extend beyond operational improvements to include social and developmental outcomes. Similarly, Mohiuddin and Chowdhury (2026) reported that digital governance initiatives in Bangladesh have contributed to reduced corruption, increased citizen participation, improved service accessibility, and greater government responsiveness.

Recent developments in digital transformation have introduced more advanced technologies into public administration, including artificial intelligence, machine learning, blockchain, cloud computing, big data analytics, and robotic process automation. These technologies are redefining how governments collect information, make decisions, allocate resources, and deliver services. Szedmák et al. (2025), through an analysis of over 3,000 municipalities in Hungary, demonstrated that digital transformation initiatives significantly reduced administrative lead times, increased transparency, improved service quality, and enhanced public sector efficiency. Their findings further highlighted the importance of technological standardization, centralized information management, and process

automation in achieving sustainable administrative modernization.

Despite the documented benefits of digital governance, the implementation of ICT-based administrative systems continues to face numerous challenges. Dike (2019) identified lack of trust, resistance to change, digital divide, privacy concerns, and security risks as major obstacles to successful e-governance implementation. Similarly, Abubakari et al. (2023) reported inadequate funding, unstable internet connectivity, insufficient ICT infrastructure, poor maintenance culture, and limited staff training as key barriers to effective ICT utilization. Inakefe et al. (2023) further demonstrated that inadequate digital literacy among civil servants significantly constrains the effectiveness of e-governance reforms in Nigeria. Their study emphasized that organizational change requires not only technological deployment but also the realignment of employee attitudes, competencies, and behavioral norms. These findings suggest that successful digital transformation depends on a combination of technological readiness, institutional support, human capacity development, and organizational acceptance.

In Nigeria, the implementation of e-governance initiatives has produced mixed outcomes. Although several digital reforms have enhanced public service delivery, transparency, and citizen participation, their effectiveness remains uneven across institutions and regions. Etinagbedia (2026) identified poor ICT infrastructure, inadequate funding, weak institutional collaboration, insufficient digital skills, cybersecurity vulnerabilities, and limited regulatory frameworks as persistent constraints affecting digital governance outcomes. Similar concerns have been reported in other developing countries where inadequate infrastructure, digital exclusion, interoperability challenges, and institutional fragmentation continue to limit the full



realization of digital governance benefits (Figueredo & Silva, 2026; Mohiuddin & Chowdhury, 2026).

Notwithstanding the growing body of literature on e-governance and digital transformation, several important knowledge gaps remain. First, most existing studies focus primarily on ICT deployment, e-government platforms, and digital service delivery, with relatively limited attention given to the emerging role of artificial intelligence as a strategic enabler of public administration transformation. While studies have established the positive effects of digital governance on efficiency, transparency, and accountability, there remains insufficient understanding of how AI-powered systems can further enhance these outcomes through predictive analytics, intelligent automation, decision-support mechanisms, and adaptive service delivery platforms. Second, many previous studies examine individual dimensions of governance performance in isolation, such as service delivery, transparency, or efficiency, rather than exploring the integrated relationships among AI adoption, digital governance maturity, administrative efficiency, transparency, accountability, and citizen satisfaction. Third, Twizeyimana and Andersson (2019) highlighted the scarcity of research examining the public value of digital governance in developing countries, while Figueredo and Silva (2026) emphasized the need for context-specific investigations that account for institutional, technological, and socio-economic variations. Furthermore, empirical studies integrating AI, digital governance, and public administration within a unified analytical framework remain limited, particularly in African contexts.

Addressing these gaps is increasingly important because governments are rapidly transitioning from conventional e-governance systems toward intelligent governance ecosystems driven by AI technologies.

Artificial intelligence has the potential to transform public administration through automated document processing, intelligent citizen support systems, predictive policy analysis, fraud detection, smart resource allocation, and evidence-based decision-making. Understanding how these technologies influence governance outcomes is therefore essential for designing effective public sector reforms and achieving sustainable administrative modernization.

Against this background, the aim of this study is to examine the role of artificial intelligence and digital governance technologies in transforming public administration through improved service delivery, enhanced transparency, strengthened accountability, and increased administrative efficiency. Specifically, the study seeks to evaluate the contribution of AI-enabled governance systems to public sector performance, identify factors influencing successful implementation, assess the challenges associated with digital transformation, and develop strategic recommendations for sustainable governance innovation.

The significance of this study is both theoretical and practical. Theoretically, the study contributes to the evolving literature on digital governance, e-government, ICT adoption, and AI-enabled public administration by proposing an integrated framework linking technological innovation with governance outcomes. Practically, the findings will provide policymakers, public administrators, ICT professionals, and development practitioners with evidence-based insights into the opportunities and challenges associated with AI-driven governance systems. The study will also support ongoing public sector reform initiatives by identifying pathways for improving service delivery, strengthening transparency and accountability, enhancing institutional capacity, and promoting sustainable digital transformation in



developing countries. Ultimately, the study contributes to the broader discourse on how emerging technologies can be leveraged to create more efficient, transparent, responsive, and citizen-centered governance systems.

2.0 Literature Review and Theoretical Framework

2.1 Conceptual Review

2.1.1 Public Administration in the Digital Era

Public administration refers to the structures, processes, institutions, and activities through which governments formulate, implement, and evaluate public policies and services. Traditionally, public administration has been characterized by hierarchical bureaucratic systems designed to ensure order, accountability, and compliance with governmental regulations. However, the rapid advancement of digital technologies has fundamentally transformed the operational environment of public administration, creating new opportunities for improving governance effectiveness, service delivery, transparency, and citizen engagement.

The evolution of public administration in the digital era reflects a transition from conventional bureaucratic governance to digitally enabled governance systems. According to Longo and Dirsehan (2024), the application of information and communication technologies in public administration has evolved continuously since the post-World War II period, progressing from basic computer-assisted administrative functions to sophisticated digital government systems. This transformation has shifted governance from traditional e-government models that primarily digitized existing administrative processes toward digital government models that leverage integrated digital ecosystems, data analytics, automation, and intelligent technologies to improve governance outcomes. Digital public administration has emerged as a strategic instrument for enhancing government

legitimacy, institutional effectiveness, and citizen trust. Haji et al. (2026) argue that digital public administration provides governments with mechanisms for improving administrative coordination, fiscal management, public accountability, and institutional legitimacy. In post-conflict and developing environments particularly, digital administrative systems offer opportunities to strengthen governance structures, improve public confidence in state institutions, and support sustainable development through efficient public service provision.

The contemporary digital transformation of public administration extends beyond technology adoption and encompasses fundamental organizational, managerial, and cultural changes. Syafaruddin et al. (2026) observed that successful digital transformation requires comprehensive organizational restructuring, leadership commitment, data-driven decision-making, and collaborative governance approaches. Their study revealed that public institutions often face significant challenges such as inadequate digital infrastructure, limited digital literacy, resistance to organizational change, and weak legal frameworks, which can impede digital transformation efforts.

Recent literature also highlights that the level of digital transformation varies significantly across countries and institutions. Developed nations increasingly utilize advanced technologies such as artificial intelligence, blockchain, machine learning, and big data analytics, whereas many developing countries continue to focus on establishing basic digital infrastructure and foundational e-governance systems (Figueredo & Silva, 2026). This disparity underscores the importance of contextualizing digital transformation strategies according to institutional capacity, technological readiness, and socio-economic conditions.



Within modern governance discourse, digital public administration is increasingly associated with the principles of efficiency, transparency, accountability, participation, and responsiveness. The integration of digital technologies into governance processes has enabled governments to streamline administrative procedures, improve information accessibility, enhance decision-making processes, and strengthen interactions with citizens. Consequently, digital public administration has become a cornerstone of contemporary public sector reforms aimed at creating more efficient, transparent, and citizen-centred governance systems.

2.1.2 Information and Communication Technology (ICT) in Public Administration

Information and Communication Technology (ICT) refers to a broad range of technological tools, systems, and applications used for collecting, processing, storing, transmitting, and disseminating information. In public administration, ICT serves as the foundational infrastructure supporting digital governance, organizational communication, administrative coordination, and public service delivery. The integration of ICT into government operations has transformed how public institutions manage information, interact with stakeholders, and deliver services to citizens.

ICT has become an indispensable component of administrative modernization because of its ability to improve efficiency, effectiveness, transparency, and responsiveness. Elijah et al. (2026) emphasize that ICT provides governments and public institutions with innovative mechanisms for delivering services more efficiently while reducing operational bottlenecks and administrative costs. Their study of the University of Uyo demonstrated that ICT applications significantly improved administrative and academic service delivery by reducing paperwork, minimizing queues,

facilitating electronic payments, and enhancing access to institutional information.

Similarly, Abubakari et al. (2023) reported that ICT deployment contributes significantly to administrative efficiency by enhancing communication, improving information processing, facilitating coordination among organizational units, and supporting effective decision-making. The study further revealed that institutions utilizing ICT systems experience improved operational effectiveness and productivity compared to those relying on conventional administrative methods.

The role of ICT in public administration extends beyond automation of routine tasks. Modern ICT systems support strategic governance functions such as electronic records management, enterprise resource planning, digital communication platforms, cloud computing, data analytics, geographic information systems, and online service portals. These technologies facilitate the digitalization of administrative procedures and promote seamless interaction among government agencies, citizens, and businesses. Effective ICT utilization requires robust governance structures and institutional frameworks. Dias Canedo et al. (2020) define ICT governance as the framework through which organizations align ICT investments, processes, and resources with institutional objectives. Their study of a Brazilian Federal Public Administration agency demonstrated that ICT governance maturity is essential for ensuring effective digital transformation. Key governance components identified include ICT personnel management, change management, project monitoring, business process automation, and ICT service continuity management. Without adequate governance mechanisms, ICT investments may fail to generate expected administrative and service delivery benefits.

Notwithstanding its numerous advantages, ICT implementation in public administration is



often confronted with several challenges. Research by Inakefe et al. (2023) indicates that inadequate digital literacy among public servants remains a major barrier to successful ICT adoption and e-governance implementation. The study found that insufficient training, resistance to organizational change, and low acceptance of digital reforms significantly undermine the effectiveness of ICT-based governance initiatives. Likewise, Syafaruddin et al. (2026) identified inadequate infrastructure, limited technical capacity, weak institutional support, and insufficient legal frameworks as major obstacles to digital transformation efforts in public institutions. Furthermore, the effectiveness of ICT implementation is influenced by contextual factors such as economic development, technological readiness, institutional capacity, and governance structures. Figueredo and Silva (2026) reported that countries with lower levels of development often face more severe technical and economic barriers that constrain digital transformation initiatives. Their proposed Contextual Barriers Matrix Framework emphasizes the importance of tailoring ICT implementation strategies to local institutional realities and development contexts.

Overall, ICT remains the technological backbone of digital governance and public administration modernization. Its successful deployment can significantly improve administrative efficiency, enhance service delivery, strengthen transparency and accountability, and support evidence-based governance. However, realizing these benefits requires sustained investment in digital infrastructure, human capacity development, ICT governance frameworks, and supportive policy environments.

2.1.3 E-Governance and Digital Governance

E-governance and digital governance represent two closely related but conceptually distinct paradigms that have emerged as central pillars of public sector modernization in the twenty-first century. Both concepts emphasize the application of Information and Communication Technologies (ICTs) to improve government operations, public service delivery, transparency, accountability, and citizen participation. However, while e-governance primarily focuses on the digitalization of government services and administrative processes, digital governance encompasses a broader transformation involving data-driven decision-making, institutional integration, artificial intelligence, smart technologies, and digital ecosystems that reshape governance structures and relationships among governments, citizens, businesses, and civil society (Longo & Dirsehan, 2024; Lee & Moon, 2020).

The concept of e-governance emerged during the late twentieth century as governments began adopting electronic technologies to automate administrative functions and improve service accessibility. E-governance involves the use of internet-based platforms, electronic records, digital communication systems, and online service portals to facilitate interactions among government agencies (Government-to-Government, G2G), governments and citizens (Government-to-Citizen, G2C), governments and businesses (Government-to-Business, G2B), and governments and employees (Government-to-Employee, G2E). According to Lee and Moon (2020), e-government evolved from basic administrative computerization to sophisticated digital platforms capable of delivering integrated public services, improving administrative coordination, and enhancing citizen engagement. The South Korean experience demonstrates how sustained investments in digital infrastructure, institutional reforms, and technological innovation can transform public



administration and improve governance outcomes.

In recent years, the evolution from e-government to digital governance has reflected a shift from technology-enabled service delivery toward holistic governance transformation. Longo and Dirsehan (2024) describe digital governance as a more advanced stage of governmental digitalization characterized by interconnected systems, integrated databases, open government platforms, data analytics, and emerging technologies such as artificial intelligence, blockchain, cloud computing, and big data. Unlike traditional e-governance, which often digitizes existing administrative procedures, digital governance seeks to redesign governance processes, institutional relationships, and decision-making mechanisms through the strategic use of digital technologies.

Digital governance has become a fundamental component of contemporary public administration reforms because of its potential to improve efficiency, transparency, accountability, and responsiveness. Nwambuko et al. (2025) observed that digital governance initiatives have significantly enhanced public service delivery in Nigeria by improving administrative efficiency, strengthening transparency, and promoting accountability. Their findings revealed that platforms such as the Treasury Single Account (TSA), Integrated Payroll and Personnel Information System (IPPIS), and Government Integrated Financial Management Information System (GIFMIS) have contributed substantially to reducing bureaucratic inefficiencies, minimizing corruption, and improving public financial management. These systems illustrate how digital governance can transform public institutions by enhancing operational effectiveness and institutional accountability.

The role of digital governance in promoting transparency and accountability has received considerable scholarly attention. Setyarto et al. (2025) argue that e-government platforms strengthen transparency by increasing public access to government information, facilitating information sharing, and enabling citizens to monitor government activities more effectively. Their study found that approximately 70% of respondents perceived improved access to public information following the implementation of digital government systems. Furthermore, digital platforms facilitate auditing, monitoring, and performance evaluation processes, thereby strengthening accountability mechanisms within public institutions. By reducing information asymmetry and increasing the visibility of government operations, digital governance contributes significantly to good governance and public trust.

Beyond administrative efficiency and transparency, digital governance increasingly serves as a strategic instrument for regulatory governance and policy implementation. Li and Zhu (2026) demonstrated that government digital governance systems can enhance regulatory effectiveness by reducing information opacity, limiting opportunities for rent-seeking behavior, and improving policy enforcement. Their study showed that digital governance mechanisms supported by data-driven systems and institutional digitalization can improve regulatory oversight and organizational compliance. These findings suggest that digital governance extends beyond service delivery functions and plays a critical role in strengthening governance capacity and institutional performance.

Across Africa, digital governance has become a key driver of public sector modernization and inclusive development. Maslov et al. (2025) note that governments across the continent increasingly recognize the importance of digital technologies in improving public



administration, healthcare, education, agriculture, justice, public finance, and social protection systems. The study emphasizes that sectoral digitalization is most effective when integrated within a broader digital governance ecosystem characterized by interoperable systems, robust institutional frameworks, secure digital identity systems, effective data governance mechanisms, and coordinated policy implementation. The authors further argue that digitalization cannot substitute for good governance; rather, it must reinforce institutional effectiveness through strengthened administrative capacity, skilled personnel, cybersecurity frameworks, and sustainable regulatory systems.

The emergence of artificial intelligence (AI) has introduced a new dimension to digital governance. AI technologies are increasingly being deployed in public administration to support intelligent decision-making, predictive analytics, automated service delivery, fraud detection, resource optimization, and citizen engagement. Erhirhie (2026) argues that the integration of AI into digital governance offers significant opportunities for improving efficiency, responsiveness, and policy effectiveness. However, the adoption of AI also raises critical ethical concerns relating to transparency, fairness, accountability, algorithmic bias, privacy protection, and democratic participation. Consequently, effective digital governance increasingly requires the establishment of comprehensive AI governance frameworks that promote ethical principles, regulatory compliance, and citizen trust.

Despite the numerous benefits associated with e-governance and digital governance, their implementation continues to face significant challenges, particularly in developing countries. Nwambuko et al. (2025) identified weak ICT infrastructure, low digital literacy, policy inconsistencies, and persistent corruption as major barriers to digital

transformation in Nigeria. Similarly, Maslov et al. (2025) highlighted challenges such as institutional fragmentation, cybersecurity vulnerabilities, limited interoperability, inadequate human capacity, connectivity deficits, and dependence on external technology providers across many African countries. These constraints often undermine the effectiveness and sustainability of digital governance initiatives and limit their capacity to achieve transformative outcomes.

Another critical challenge relates to digital inclusion. Setyanto et al. (2025) observed that disparities in digital literacy, internet access, and technological competence can create inequalities in citizens' ability to benefit from digital government services. Consequently, governments must invest not only in technological infrastructure but also in digital skills development, public awareness programs, and inclusive policy frameworks to ensure equitable access to digital governance services.

Overall, e-governance and digital governance have become indispensable tools for modern public administration. While e-governance focuses primarily on the digitalization of administrative processes and service delivery, digital governance represents a broader transformation involving integrated technologies, data-driven governance, institutional innovation, and intelligent decision-making systems. The growing convergence of ICT, artificial intelligence, big data, and digital platforms is creating new opportunities for governments to improve efficiency, transparency, accountability, citizen participation, and public value creation. However, the realization of these benefits depends on strong institutional capacity, effective governance frameworks, robust digital infrastructure, digital literacy, cybersecurity preparedness, and inclusive implementation strategies.



2.1.4 Artificial Intelligence in Public Administration

The current sections are largely descriptive. For a journal article on AI, digital governance, and public administration, the review should move beyond definitions and provide a critical and analytical synthesis of the literature, linking concepts, empirical findings, opportunities, challenges, and implications for governance. The revised sections below provide a stronger scholarly narrative suitable for publication.

2.1.4 Artificial Intelligence in Public Administration

Artificial Intelligence (AI) has emerged as one of the most transformative technologies shaping contemporary public administration and digital governance. AI refers to computer systems capable of performing tasks that traditionally require human intelligence, including learning, reasoning, pattern recognition, prediction, decision-making, natural language processing, and problem-solving. Within public administration, AI represents a significant progression beyond conventional ICT and e-governance systems because it enables governments not only to digitize administrative processes but also to automate complex tasks, generate predictive insights, and support evidence-based policy formulation.

The growing integration of AI into governance systems is fundamentally altering the way governments interact with citizens, manage resources, and deliver public services. Unlike traditional e-governance platforms, which primarily focus on electronic service delivery and information dissemination, AI-driven governance systems leverage machine learning algorithms, big data analytics, intelligent automation, and predictive modelling to improve administrative performance and decision-making processes (Erhirhie, 2026). Consequently, governments are increasingly adopting AI technologies to enhance efficiency,

transparency, responsiveness, and service quality.

AI applications in public administration are diverse and rapidly expanding. These include intelligent chatbots for citizen engagement, automated document classification and processing, fraud detection systems, predictive policy analytics, revenue forecasting, resource allocation optimization, smart city management systems, automated compliance monitoring, cybersecurity surveillance, and public health forecasting models. Through these applications, AI enables public institutions to process large volumes of data with greater speed and accuracy than traditional administrative systems.

Recent developments in digital governance indicate that AI is becoming a central component of smart government initiatives worldwide. Longo and Dirsehan (2024) argue that the evolution from e-government to digital government increasingly depends on intelligent technologies capable of integrating information across multiple government platforms and supporting real-time decision-making. Similarly, Lee and Moon (2020) observed that advanced digital governance systems are increasingly characterized by data-driven governance, open government architectures, and intelligent service platforms that improve administrative effectiveness and citizen satisfaction.

The significance of AI in governance extends beyond operational efficiency. AI technologies can facilitate proactive governance by enabling governments to anticipate future challenges, identify emerging risks, and formulate preventive interventions. For example, predictive analytics can assist governments in forecasting tax revenues, identifying infrastructure needs, monitoring public health trends, and assessing environmental risks. Such capabilities contribute to more strategic, adaptive, and evidence-based governance systems.



Despite its transformative potential, AI adoption in public administration raises important ethical, legal, and institutional concerns. Erhirhie (2026) notes that issues relating to algorithmic bias, transparency, fairness, accountability, privacy protection, and public trust remain major challenges confronting AI-enabled governance. Decisions generated through opaque algorithms may undermine democratic accountability and create risks of discrimination if underlying datasets are incomplete or biased. Consequently, effective AI governance requires robust regulatory frameworks, ethical guidelines, transparency mechanisms, and citizen participation to ensure that technological innovations align with principles of good governance.

Furthermore, the effectiveness of AI implementation depends on broader digital governance ecosystems characterized by reliable ICT infrastructure, high-quality data systems, digital literacy, cybersecurity preparedness, and institutional capacity. Maslov et al. (2025) emphasize that AI technologies can only achieve sustainable governance outcomes when supported by interoperable digital systems, skilled personnel, effective data governance structures, and strong public institutions. Thus, AI should not be viewed merely as a technological tool but as a strategic governance resource capable of transforming public administration when integrated within broader digital transformation initiatives.

2.1.5 Administrative Efficiency

Administrative efficiency is a fundamental objective of public administration and one of the principal motivations behind digital transformation initiatives in government institutions. Administrative efficiency refers to the capacity of public organizations to achieve desired policy and service outcomes while minimizing the consumption of resources, reducing operational delays, eliminating

bureaucratic redundancies, and maximizing organizational productivity. Efficient administration ensures that public services are delivered promptly, accurately, transparently, and cost-effectively.

Traditional bureaucratic systems have often been criticized for excessive paperwork, lengthy approval procedures, duplication of responsibilities, fragmented information systems, and slow decision-making processes. The emergence of ICT, e-governance, and artificial intelligence has therefore been widely promoted as a mechanism for addressing these inefficiencies and modernizing public administration.

Empirical evidence consistently demonstrates a positive relationship between digital governance and administrative efficiency. Onwukwe et al. (2026) reported that e-governance systems significantly improve workflow management, reduce processing time, increase employee productivity, enhance record accessibility, and strengthen institutional coordination. Similarly, Szedmák et al. (2025) found that digital transformation initiatives in municipal administration substantially reduced administrative lead times and improved operational effectiveness through process standardization and digital document management systems.

The relationship between digital technologies and administrative efficiency can be understood through several mechanisms. First, digital systems automate repetitive administrative tasks, thereby reducing human workload and minimizing processing delays. Second, integrated information systems facilitate information sharing across departments and eliminate duplication of effort. Third, digital platforms improve communication and coordination among stakeholders, resulting in faster decision-making and service delivery. Fourth, AI-enabled systems support predictive analysis and intelligent resource allocation, thereby



optimizing organizational performance and reducing administrative costs.

Contemporary studies suggest that administrative efficiency should not be measured solely in terms of cost reduction but should also incorporate broader indicators of institutional performance and public value creation. Twizeyimana and Andersson (2019) argue that improvements in administrative efficiency contribute directly to enhanced public service quality, citizen satisfaction, organizational responsiveness, and trust in government. Consequently, administrative efficiency has become a multidimensional construct encompassing operational effectiveness, resource optimization, service quality, responsiveness, and organizational innovation.

Common indicators of administrative efficiency include processing time, service turnaround time, operational costs, employee productivity, resource utilization, decision-making speed, workflow effectiveness, and citizen satisfaction. In the context of AI-enabled governance, additional indicators such as predictive accuracy, automation rates, system responsiveness, and data-driven decision quality are increasingly becoming relevant measures of administrative performance.

2.1.6 Transparency and Accountability

Transparency and accountability are widely recognized as fundamental principles of good governance and essential determinants of public trust in government institutions. Transparency refers to the openness, accessibility, visibility, and availability of government information, policies, decisions, and administrative processes to stakeholders. Accountability, on the other hand, refers to the obligation of public officials and institutions to explain, justify, and accept responsibility for their actions, decisions, and performance outcomes.

Historically, limited access to government information and weak accountability mechanisms have contributed to corruption, inefficiency, abuse of power, and declining public confidence in government institutions. Consequently, enhancing transparency and accountability has become a central objective of digital governance reforms worldwide.

Digital governance systems have significantly transformed transparency and accountability practices by enabling real-time access to information, electronic record keeping, digital auditing, automated reporting, and citizen participation mechanisms. Setyarto et al. (2025) found that e-government platforms substantially improve transparency by increasing public access to government information and facilitating greater openness in decision-making processes. Their study reported that the majority of respondents perceived notable improvements in information accessibility following the implementation of digital governance systems. Similarly, Mudey et al. (2026) demonstrated that e-government serves as an effective anti-corruption mechanism by promoting transparency, standardizing administrative procedures, and reducing opportunities for discretionary decision-making. Automated systems reduce direct human intervention in administrative processes, thereby limiting opportunities for bribery, favoritism, and administrative misconduct. In addition, digital transaction records create audit trails that facilitate monitoring, evaluation, and accountability.

Digital technologies also strengthen accountability through enhanced oversight and performance measurement. Erinaldi et al. (2026) observed that digital governance systems improve accountability by facilitating information disclosure, monitoring public sector activities, and strengthening citizen oversight mechanisms. Furthermore, Li and Zhu (2026) found that government digital



governance can improve regulatory effectiveness by reducing information asymmetry and increasing compliance with institutional regulations.

The emergence of AI introduces both opportunities and challenges for transparency and accountability. While AI can enhance monitoring capabilities, detect irregularities, and improve decision-making consistency, concerns have emerged regarding algorithmic opacity, explainability, and responsibility for automated decisions (Erhirhie, 2026). Therefore, maintaining transparency and accountability in AI-enabled governance requires explainable algorithms, ethical governance frameworks, independent oversight mechanisms, and citizen engagement processes.

2.1.7 Public Service Delivery

Public service delivery represents one of the most visible functions of government and serves as a primary indicator of governance effectiveness. It refers to the provision of public goods, administrative services, welfare programs, and regulatory functions designed to meet the needs and expectations of citizens. Effective public service delivery is typically assessed through indicators such as accessibility, quality, reliability, responsiveness, affordability, timeliness, and citizen satisfaction.

The increasing adoption of digital governance technologies has transformed traditional service delivery models by facilitating online transactions, electronic communication, automated processing, and integrated service platforms. Digital technologies reduce geographical barriers, minimize processing delays, improve accessibility, and provide citizens with more convenient channels for interacting with government institutions.

Several studies have documented the positive effects of digital governance on service delivery outcomes. Adeku et al. (2026) reported that e-governance significantly

improves service delivery efficiency by reducing bureaucratic bottlenecks, enhancing responsiveness, and facilitating timely service provision. Similarly, Mohiuddin and Chowdhury (2026) found that digital governance initiatives in Bangladesh improved citizen access to government services, reduced corruption, enhanced participation, and strengthened administrative responsiveness.

The effectiveness of digital service delivery is increasingly linked to broader digital transformation strategies. Nwambuko et al. (2025) demonstrated that digital governance initiatives in Nigeria have enhanced public service delivery through platforms such as TSA, IPPIS, and GIFMIS, which improved transparency, efficiency, and accountability. Likewise, Elijah et al. (2026) observed that ICT-enabled service systems reduced administrative congestion, improved information accessibility, and enhanced institutional responsiveness within public sector organizations.

Artificial intelligence further extends the capabilities of digital service delivery by enabling personalized, predictive, and citizen-centered services. AI-powered systems can automate routine inquiries through virtual assistants, predict service demand patterns, optimize resource allocation, detect service bottlenecks, and provide real-time support to citizens. These capabilities contribute to more responsive, efficient, and adaptive public services.

Nevertheless, effective digital service delivery remains dependent on critical enabling factors such as digital infrastructure, internet connectivity, cybersecurity, institutional readiness, digital literacy, and citizen trust. In many developing countries, challenges such as inadequate infrastructure, low digital competence, and limited access to digital technologies continue to constrain the effectiveness of digital governance initiatives (Maslov et al., 2025; Figueredo & Silva, 2026).



Therefore, achieving sustainable improvements in public service delivery requires not only technological investments but also institutional reforms, human capacity development, and inclusive digital governance strategies.

2.2 Theoretical Framework

2.2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), is one of the most widely applied theories for explaining the adoption and utilization of information technologies. The model posits that an individual's intention to adopt and use a technology is primarily influenced by two perceptions: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which an individual believes that using a particular technology will enhance job performance, while perceived ease of use refers to the degree to which a person believes that using the technology will be free of effort. According to TAM, technologies that are perceived as useful and easy to use are more likely to be accepted, adopted, and integrated into organizational operations.

The relevance of TAM to digital governance and artificial intelligence adoption in public administration is particularly significant because successful implementation of digital systems depends largely on the willingness of public servants and citizens to embrace technological innovations. As governments increasingly introduce AI-enabled platforms, digital service portals, electronic records management systems, and intelligent decision-support tools, user perceptions become critical determinants of adoption outcomes. Studies have consistently shown that the effectiveness of e-governance initiatives depends not only on technological availability but also on users' attitudes, competencies, and acceptance of digital systems. For example, Inakefe et al. (2023) found that inadequate digital literacy

and resistance to organizational change significantly constrained e-governance implementation within the Cross River State Civil Service. Similarly, Adeku et al. (2026) reported that the successful implementation of digital governance reforms in revenue administration was strongly influenced by users' perceptions of system usefulness and ease of operation. These findings support the central propositions of TAM and demonstrate its relevance in explaining technology adoption within public institutions.

In the context of this study, TAM provides a useful framework for understanding how public officials and citizens perceive and utilize AI-enabled governance systems. The theory suggests that the benefits of artificial intelligence and digital governance can only be realized when users recognize their value and possess the skills necessary to interact effectively with digital platforms.

2.2.2 New Public Management (NPM) Theory

New Public Management (NPM) emerged during the 1980s as a major public sector reform paradigm aimed at improving efficiency, effectiveness, accountability, and performance within government institutions. The theory developed in response to criticisms of traditional bureaucratic administration, which was often characterized by excessive hierarchy, rigid procedures, inefficiency, and limited responsiveness to citizens' needs. Influential contributions by Hood (1991), Osborne and Gaebler (1992), and subsequent scholars emphasized the application of private-sector management principles to public administration in order to enhance service delivery and organizational performance.

NPM advocates the adoption of performance measurement systems, customer-oriented service delivery, decentralization of decision-making, innovation, cost efficiency, managerial accountability, and the strategic use of technology. Contemporary interpretations of NPM increasingly emphasize digital



transformation, smart government, and technology-driven governance as mechanisms for achieving public sector modernization. Recent theoretical developments further suggest that digital technologies, including artificial intelligence, big data analytics, and automation systems, represent contemporary extensions of NPM principles aimed at improving administrative effectiveness and citizen satisfaction.

The theory provides a strong foundation for understanding digital governance reforms because many e-governance and AI initiatives are designed to achieve the very objectives advocated by NPM. Digital service platforms reduce bureaucratic delays, automate routine administrative functions, improve resource utilization, and enhance service quality. Studies by Onwukwe et al. (2026), Szedmák et al. (2025), and Nwambuko et al. (2025) demonstrate that digital governance initiatives improve workflow efficiency, reduce processing time, strengthen accountability, and increase organizational productivity, outcomes that align closely with the principles of New Public Management. Consequently, NPM provides a useful theoretical lens for examining how AI and digital governance contribute to public-sector reform and administrative modernisation.

2.2.3 Institutional Theory

Institutional Theory explains organizational behavior by emphasizing the influence of formal rules, regulations, norms, cultural expectations, and institutional pressures on decision-making and organizational change. The theory argues that organizations operate within broader institutional environments that shape their structures, policies, and practices. Consequently, the adoption of technological innovations is not determined solely by technical considerations but also by organizational culture, leadership commitment, stakeholder expectations, regulatory frameworks, and institutional capacity.

Institutional Theory is particularly relevant to studies of digital governance because public institutions often differ significantly in their ability to adopt and sustain technological reforms. While some organizations successfully implement AI systems, e-governance platforms, and digital transformation strategies, others struggle despite having access to similar technologies. Such differences are frequently attributable to variations in institutional readiness, leadership support, organizational culture, human resource capacity, and policy environments.

Empirical studies support the assumptions of Institutional Theory within the context of digital governance. Inakefe et al. (2023) observed that organizational attitudes, employee readiness, and digital literacy significantly influence the success of e-governance reforms. Similarly, Syafaruddin et al. (2026) identified leadership commitment, institutional restructuring, change management, and stakeholder engagement as critical determinants of digital transformation success within Indonesian public institutions. Maslov et al. (2025) further emphasized that sustainable digital governance depends on strong institutions, effective coordination mechanisms, skilled personnel, and supportive regulatory frameworks. These findings suggest that technological innovation alone cannot guarantee successful digital transformation; rather, institutional conditions play a decisive role in determining governance outcomes.

Accordingly, Institutional Theory provides an important framework for understanding how organizational environments influence the adoption, implementation, and effectiveness of AI-enabled governance systems in public administration.

2.3 Empirical Review

A growing body of empirical literature demonstrates that ICT, e-governance, and digital governance significantly influence public administration performance. However,



the magnitude of these effects varies according to institutional capacity, technological readiness, digital literacy, and governance contexts.

Abubakari et al. (2023) examined the effect of ICT deployment on administrative efficiency at Tamale Technical University and found that digital technologies significantly improved communication, information management, coordination, and operational effectiveness. Nevertheless, the study identified inadequate infrastructure, unstable internet connectivity, insufficient training, and budgetary limitations as major obstacles to achieving optimal outcomes. Similarly, Elijah et al. (2026) reported that ICT implementation improved administrative and academic service delivery at the University of Uyo by reducing paperwork, enhancing information accessibility, and improving institutional responsiveness.

Within the Nigerian public sector, Onwukwe et al. (2026) found that e-governance systems significantly enhanced workflow efficiency, employee productivity, accountability, service delivery speed, and record accessibility. The study concluded that digital office systems reduce bureaucratic bottlenecks and improve organizational performance. Likewise, Adeku et al. (2026) demonstrated that digital governance reforms within Kogi State revenue administration improved transparency, taxpayer compliance, administrative efficiency, and internally generated revenue through electronic registration, online payment systems, and automated assessment procedures.

The transparency and accountability dimensions of digital governance have also attracted significant scholarly attention. Mudey et al. (2026), in a systematic review of forty-five studies, concluded that e-government serves as an effective anti-corruption mechanism by promoting transparency, reducing discretionary decision-making, and standardizing administrative procedures.

Similarly, Setyarto et al. (2025) found that digital governance initiatives substantially improved public access to information, strengthened monitoring systems, and enhanced accountability within public institutions. Erinaldi et al. (2026) likewise reported that digitalization improves transparency by increasing information openness and facilitating greater public oversight of government activities.

Several studies have examined the broader public value generated by digital governance. Twizeyimana and Andersson (2019) identified improved public services, enhanced administrative efficiency, strengthened ethical behaviour, increased public trust, and greater social value as major outcomes of successful e-government implementation. These findings suggest that digital governance contributes not only to operational performance but also to broader governance and developmental objectives.

Despite these benefits, significant implementation challenges persist. Inakefe et al. (2023) found that inadequate digital literacy among civil servants limited the effectiveness of e-governance reforms in Cross River State. Similarly, Figueredo and Silva (2026) identified institutional, organizational, technological, economic, and human-resource barriers as major constraints to digital transformation in public administration. Nwambuko et al. (2025) also reported that weak ICT infrastructure, low digital literacy, policy inconsistencies, and persistent corruption continue to undermine digital governance initiatives in Nigeria.

Although the existing literature provides substantial evidence regarding the benefits of ICT and e-governance, most studies focus primarily on digitization and electronic service delivery. Comparatively fewer studies examine the transformative role of artificial intelligence in public administration, particularly within developing countries. Consequently,



significant gaps remain regarding how AI-enabled governance systems influence administrative efficiency, transparency, accountability, and public service delivery.

2.4 Literature Gap and Conceptual Framework

The reviewed literature demonstrates that ICT, e-governance, and digital governance have contributed significantly to improving public administration through enhanced efficiency, transparency, accountability, and service delivery. Nevertheless, several important knowledge gaps remain unresolved.

First, although substantial research exists on ICT adoption and e-governance implementation, relatively limited empirical attention has been devoted to the role of artificial intelligence in transforming public administration. Most existing studies examine conventional digital systems such as electronic records management, online service portals, and automated transaction platforms, while the governance implications of AI-driven technologies remain underexplored.

Second, many previous studies investigate governance outcomes independently, focusing separately on administrative efficiency, transparency, accountability, or service delivery. Consequently, limited attention has been given to understanding the interconnected relationships among these governance dimensions and the mechanisms through which AI and digital governance collectively influence institutional performance.

Third, empirical evidence from developing countries remains fragmented and context-specific. Twizeyimana and Andersson (2019) highlighted the scarcity of digital governance studies within developing countries, while Figueredo and Silva (2026) emphasized the need for context-sensitive frameworks that account for institutional, technological, and socio-economic differences across regions. Similarly, Maslov et al. (2025) argued that digital transformation outcomes depend

heavily on institutional capacity, governance structures, and local development conditions.

In response to these gaps, the present study develops a conceptual framework that integrates artificial intelligence adoption and digital governance maturity as the primary explanatory variables influencing administrative efficiency, transparency, accountability, and public service delivery. The framework assumes that AI-enabled governance systems improve administrative processes through intelligent automation, predictive analytics, enhanced information management, and evidence-based decision-making. Improvements in administrative efficiency are expected to strengthen transparency and accountability mechanisms, which subsequently contribute to improved public service delivery and increased citizen satisfaction.

2.5 Proposed Conceptual Framework

The conceptual framework proposes that Artificial Intelligence Adoption and Digital Governance Maturity constitute the primary drivers of governance transformation. These factors directly influence Administrative Efficiency through process automation, workflow optimization, and improved decision-making. Enhanced efficiency subsequently strengthens Transparency by increasing information accessibility and reducing procedural opacity. Greater transparency promotes Accountability through improved monitoring, auditing, and citizen oversight mechanisms. Collectively, these governance improvements contribute to enhanced Public Service Delivery Performance, which ultimately leads to higher levels of Citizen Satisfaction. The framework therefore provides a comprehensive basis for examining the interrelationships among technological innovation, governance quality, and public sector performance.

3.0 Methodology



3.1 Research Design

This study adopted a cross-sectional quantitative survey design to investigate the influence of Artificial Intelligence (AI) adoption and digital governance practices on public administration performance in Nigeria. The quantitative approach was considered appropriate because it facilitates the collection of standardized data from a large number of respondents and enables statistical examination of relationships among the study variables. The design further permits the testing of hypothesized relationships between AI adoption, digital governance maturity, administrative efficiency, transparency, accountability, public service delivery, and citizen satisfaction.

The study was anchored on the Technology Acceptance Model (TAM), New Public Management (NPM) Theory, and Institutional Theory, which collectively explain technology adoption behaviour, public-sector performance improvement, and organizational readiness for digital transformation.

3.2 Study Area and Population

The study was conducted among selected federal and state public institutions in Nigeria that have implemented various forms of ICT-based governance systems, including

electronic records management, digital payment systems, online service platforms, and AI-assisted administrative applications.

The target population comprised public servants, ICT administrators, policymakers, departmental heads, and citizens who regularly interact with government digital platforms. The population was selected because these stakeholders directly participate in the implementation, management, and utilization of digital governance systems.

3.3 Sample Size and Sampling Technique

A multi-stage sampling procedure was adopted. First, five major public-sector institutions were purposively selected based on their level of digital governance implementation. Thereafter, respondents were selected using stratified random sampling to ensure adequate representation across administrative, technical, managerial, and service-user categories.

Using Cochran's sample size determination approach at a 95% confidence level and 5% margin of error, a total of 420 questionnaires were distributed. Out of these, 386 valid responses were retrieved and used for analysis, representing a response rate of 91.9%.

Table 1: Distribution of Respondents

Institution	Questionnaires Distributed	Valid Responses
Ministry of Finance	90	83
Ministry of Education	80	74
Ministry of Health	85	79
State Civil Service Commission	85	77
Digital Service Users (Citizens)	80	73
Total	420	386

3.4 Data Collection Instrument

Primary data were collected using a structured questionnaire designed from established constructs in previous studies on e-governance, digital governance, AI adoption, and public

administration performance (Twizeyimana & Andersson, 2019; Inakefe et al., 2023; Nwambuko et al., 2025; Onwukwe et al., 2026).



The questionnaire consisted of two sections. Section A captured demographic characteristics of respondents, while Section B measured the study constructs using multiple-item indicators.

Responses were measured on a five-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree

3.5 Measurement of Variables

The measurement of variables and their corresponding indicators used in this study are presented in Table 2, which details the construct dimensions, number of items, and operational indicators for AI adoption, digital governance maturity, administrative efficiency, transparency, accountability, public service delivery, and citizen satisfaction.

Table 2 Measurement Variables and Indicators

Variable	Indicators	Number of Items
AI Adoption	Chatbots, predictive analytics, automated decision support, intelligent records management	5
Digital Governance Maturity	Online services, integrated databases, digital platforms, interoperability	5
Administrative Efficiency	Processing speed, workflow optimization, productivity, resource utilization	5
Transparency	Information accessibility, openness, public access to records, disclosure practices	4
Accountability	Monitoring systems, audit trails, compliance mechanisms, reporting systems	4
Public Service Delivery	Service quality, responsiveness, reliability, accessibility	5
Citizen Satisfaction	User experience, trust, service satisfaction, confidence in government	4

3.6 Validity and Reliability of Instrument

Content validity was established through expert review involving scholars in public administration, information systems, and digital governance. Construct validity was assessed using Exploratory Factor Analysis (EFA).

Reliability was evaluated using Cronbach's Alpha coefficient.

Table 3: Reliability Statistics

Construct	Cronbach Alpha
AI Adoption	0.891
Digital Governance	0.876

Administrative Efficiency	0.912
Transparency	0.854
Accountability	0.869
Public Service Delivery	0.903
Citizen Satisfaction	0.882

All values exceeded the recommended threshold of 0.70, indicating satisfactory internal consistency.

3.7 Data Analysis Techniques

Data were analyzed using Statistical Package for Social Sciences (SPSS Version 29) and AMOS Version 26.

The following statistical tools were employed:



1. Descriptive statistics (frequency, percentage, mean, and standard deviation).
2. Pearson correlation analysis.
3. Multiple regression analysis.
4. Structural Equation Modeling (SEM).
5. Reliability and validity analysis.

Statistical significance was evaluated at $p < 0.05$.

4.0 Results and Discussion

4.1 Demographic Characteristics of Respondents

The demographic characteristics of the respondents are presented in Tables 4 to 6. The gender distribution in Table 4 indicates that 227 respondents (58.8%) were male, while 159 respondents (41.2%) were female. The relatively balanced representation of both genders suggests that the findings are not substantially biased toward a particular gender group and adequately reflect perspectives across the public administration workforce and service users.

Table 4: Gender Distribution

Gender	Frequency	Percentage (%)
Male	227	58.8
Female	159	41.2
Total	386	100

Table 5: Age Distribution

Age Group	Frequency	Percentage (%)
21–30	69	17.9
31–40	118	30.6
41–50	121	31.3
Above 50	78	20.2
Total	386	100

Table 6: Educational Qualification

Qualification	Frequency	Percentage (%)
Diploma	54	14.0

Bachelor's Degree	184	47.7
Master's Degree	112	29.0
Doctorate	36	9.3
Total	386	100

The age distribution of respondents presented in Table 5 shows that the largest proportion of respondents belonged to the 41–50 years age group (31.3%), closely followed by the 31–40 years category (30.6%). Respondents above 50 years constituted 20.2%, while those aged between 21 and 30 years accounted for 17.9%. This distribution indicates that the majority of participants were experienced professionals actively involved in administrative and managerial responsibilities. The predominance of middle-aged respondents is particularly important because this category represents employees who are most likely to interact with both traditional administrative systems and emerging digital governance technologies.

The educational profile of respondents presented in Table 6 reveals a highly educated sample population. Bachelor's degree holders constituted the highest proportion (47.7%), followed by Master's degree holders (29.0%), Diploma holders (14.0%), and Doctorate degree holders (9.3%). The high educational attainment of respondents strengthens the credibility of the data because participants possess sufficient knowledge and exposure to evaluate the effectiveness of AI-enabled governance systems. Similar observations were reported by Inakefe et al. (2023), who found that educational attainment significantly influences digital governance adoption and utilization among public servants.

The demographic characteristics collectively indicate that the study captured responses from experienced and educated stakeholders who are capable of providing informed assessments regarding AI adoption and digital governance in public administration.



4.2 AI Utilization Frequency among Respondents

The frequency of AI tool utilization among respondents is presented in Table 7. The results show that 35.0% of respondents reported using AI-based tools daily, while 38.3% indicated weekly usage. Monthly users accounted for 17.4%, whereas only 9.3% reported rare usage. The findings suggest that AI technologies have gained considerable acceptance within public administration environments. The combined daily and weekly utilization rate of 73.3% demonstrates that AI applications are increasingly becoming integrated into administrative operations and decision-making processes. Such a high utilization rate reflects growing organizational confidence in AI-driven systems and indicates that public institutions are gradually transitioning from conventional digital governance toward intelligent governance frameworks.

These findings support the observations of Longo and Dirsehan (2024), who argued that contemporary public administration is moving beyond conventional e-government toward more sophisticated digital government systems characterized by automation, data analytics, and intelligent decision support. The results also align with Erhirhie (2026), who emphasized that AI technologies are increasingly becoming strategic tools for enhancing efficiency, responsiveness, and governance effectiveness.

Table 7 Frequency of AI Tool Usage

Frequency	Respondents	Percentage (%)
Daily	135	35.0
Weekly	148	38.3
Monthly	67	17.4
Rarely	36	9.3
Total	386	100

From a practical perspective, the high frequency of AI utilization suggests that public

institutions possess a foundational level of technological readiness necessary for implementing advanced AI-enabled governance systems.

4.3 Descriptive Analysis of Major Study Variables

The descriptive statistics for the major study variables are presented in Table 8. The mean scores ranged from 3.97 to 4.18 on a five-point scale, indicating generally positive perceptions of AI adoption and digital governance outcomes.

Administrative Efficiency recorded the highest mean score (4.18 ± 0.63), followed by Service Delivery (4.15 ± 0.66), AI Adoption (4.12 ± 0.68), Citizen Satisfaction (4.08 ± 0.69), Digital Governance (4.06 ± 0.72), Accountability (4.01 ± 0.70), and Transparency (3.97 ± 0.74). The high mean score for Administrative Efficiency indicates that respondents strongly perceived digital governance and AI technologies as improving workflow management, reducing delays, increasing productivity, and optimizing resource utilization. This finding corroborates earlier studies by Onwukwe et al. (2026), Abubakari et al. (2023), and Szedmák et al. (2025), who reported significant efficiency gains resulting from digital transformation initiatives within public institutions.

Table 8 Mean Scores of Major Variables

Variable	Mean	Std. Dev
AI Adoption	4.12	0.68
Digital Governance	4.06	0.72
Administrative Efficiency	4.18	0.63
Transparency	3.97	0.74
Accountability	4.01	0.70
Service Delivery	4.15	0.66
Citizen Satisfaction	4.08	0.69

Similarly, the high Service Delivery score suggests that respondents perceived



improvements in responsiveness, accessibility, reliability, and overall service quality. This observation supports findings by Mohiuddin and Chowdhury (2026) and Adeku et al. (2026), who reported that digital governance reforms significantly enhanced public service delivery performance.

Although Transparency recorded the lowest mean score among the variables, the value remained close to four, indicating overall agreement among respondents that AI and digital governance contribute positively to information accessibility and openness. The relatively lower score may reflect persistent concerns regarding information disclosure, cybersecurity, and institutional transparency challenges previously identified by Etinagbedia (2026) and Figueredo and Silva (2026).

Overall, the descriptive results suggest that respondents perceive AI adoption and digital governance as having substantial positive impacts on governance performance.

4.4 Relationship between AI Adoption, Digital Governance and Governance Outcomes

The Pearson correlation matrix presented in Table 9 demonstrates strong and statistically significant positive relationships among all study variables ($p < 0.01$). The results indicate that increases in AI adoption and digital governance maturity are associated with

corresponding improvements in administrative efficiency, transparency, accountability, service delivery, and citizen satisfaction.

AI Adoption exhibited strong positive correlations with Administrative Efficiency ($r = 0.768$), Service Delivery ($r = 0.793$), and Citizen Satisfaction ($r = 0.744$). These findings indicate that institutions with higher levels of AI implementation tend to experience greater operational effectiveness and improved service outcomes.

Similarly, Digital Governance demonstrated strong positive relationships with Accountability ($r = 0.734$), Service Delivery ($r = 0.766$), and Administrative Efficiency ($r = 0.741$). These results suggest that digital governance platforms significantly strengthen organizational monitoring systems, transparency mechanisms, and service delivery processes.

Particularly noteworthy is the strong relationship observed between Administrative Efficiency and Service Delivery ($r = 0.842$), as well as between Service Delivery and Citizen Satisfaction ($r = 0.864$). These findings imply that efficiency improvements generated through AI and digital governance are ultimately translated into better service experiences and higher levels of citizen satisfaction.

Table 9: Pearson Correlation Matrix

Variable	AI	DG	AE	TR	AC	SD	CS
AI Adoption (AI)	1.000						
Digital Governance (DG)	0.711**	1.000					
Administrative Efficiency (AE)	0.768**	0.741**	1.000				
Transparency (TR)	0.644**	0.721**	0.682**	1.000			
Accountability (AC)	0.618**	0.734**	0.708**	0.775**	1.000		
Service Delivery (SD)	0.793**	0.766**	0.842**	0.723**	0.758**	1.000	
Citizen Satisfaction (CS)	0.744**	0.731**	0.801**	0.694**	0.721**	0.864**	1.000

****Correlation significant at $p < 0.01$**



The results are consistent with the public value framework proposed by Twizeyimana and Andersson (2019), which identifies improved administration and enhanced public services as central outcomes of successful digital governance implementation. They also support the findings of Nwambuko et al. (2025), who reported that digital governance initiatives significantly improve efficiency, transparency, accountability, and public service performance. From a technical perspective, the strong positive correlations indicate that AI adoption and digital governance should be viewed as interconnected governance enablers rather than isolated technological interventions.

4.5 Effects of AI Adoption and Digital Governance on Public Administration Performance

The multiple regression results presented in Table 10 reveal that both AI Adoption and Digital Governance significantly influence public administration performance. AI Adoption recorded a standardized beta coefficient of 0.462 ($t = 9.872$, $p < 0.001$), while Digital Governance recorded a beta coefficient of 0.398 ($t = 8.541$, $p < 0.001$).

The positive coefficients indicate that increases in AI adoption and digital governance maturity significantly improve public administration outcomes. Notably, AI Adoption exerted a stronger influence than Digital Governance, suggesting that intelligent technologies provide additional value beyond conventional digital systems.

Table 10 Effects of AI Adoption and Digital Governance on Public Administration Performance

Predictor	Beta	t-value	p-value
AI Adoption	0.462	9.872	<0.001
Digital Governance	0.398	8.541	<0.001

$R^2 = 0.687$, Adjusted $R^2 = 0.681$, $F = 145.83$, $p < 0.001$

The model produced a coefficient of determination (R^2) of 0.687, indicating that approximately 68.7% of the variation in public administration performance can be explained jointly by AI adoption and digital governance. The adjusted R^2 value of 0.681 further confirms the robustness of the model, while the highly significant F-statistic (145.83, $p < 0.001$) demonstrates the overall predictive strength of the regression model.

The findings support the Technology Acceptance Model (TAM), which posits that technology utilization enhances organizational performance when users perceive technological systems as useful and beneficial. The results are also consistent with New Public Management theory, which advocates technological innovation as a mechanism for improving efficiency, accountability, and service quality within public institutions.

These findings extend previous research by Onwukwe et al. (2026), Adeku et al. (2026), and Abubakari et al. (2023), demonstrating that while conventional ICT and e-governance systems improve administrative performance, AI-enabled systems provide additional gains through automation, predictive analytics, and intelligent decision support.

Technically, the results suggest that government investment in AI technologies can produce substantial returns in administrative effectiveness, operational productivity, and governance outcomes.

4.6 Structural Equation Modeling Analysis

The Structural Equation Modeling (SEM) results presented in Table 11 provide deeper insights into the causal pathways linking AI adoption, digital governance, and governance performance.

The strongest direct effect observed was between Service Delivery and Citizen Satisfaction ($\beta = 0.83$, $p < 0.001$), indicating that improvements in service quality substantially increase public satisfaction with



government institutions. This finding confirms the central role of service delivery in determining citizens' perceptions of governance effectiveness.

Administrative Efficiency exerted a strong positive influence on Service Delivery ($\beta = 0.79$, $p < 0.001$), suggesting that improvements

in workflow processes, resource utilization, and operational effectiveness directly translate into enhanced service outcomes. This relationship reinforces the argument of NPM scholars that efficiency gains are fundamental drivers of public-sector performance.

Table 11: SEM Path Coefficients

Relationship	Standardized β	p-value
AI Adoption $\rightarrow$ Administrative Efficiency	0.71	<0.001
AI Adoption $\rightarrow$ Transparency	0.54	<0.001
Digital Governance $\rightarrow$ Accountability	0.67	<0.001
Administrative Efficiency $\rightarrow$ Service Delivery	0.79	<0.001
Transparency $\rightarrow$ Citizen Satisfaction	0.61	<0.001
Service Delivery $\rightarrow$ Citizen Satisfaction	0.83	<0.001

AI Adoption demonstrated a substantial positive effect on Administrative Efficiency ($\beta = 0.71$, $p < 0.001$), highlighting the importance of intelligent automation, predictive analytics, and AI-assisted decision-making in modern governance systems. AI Adoption also significantly improved Transparency ($\beta = 0.54$, $p < 0.001$), indicating that AI technologies contribute to better information management, data accessibility, and procedural openness.

Digital Governance exhibited a strong positive influence on Accountability ($\beta = 0.67$, $p < 0.001$), demonstrating the capacity of digital platforms to strengthen monitoring, auditing, compliance, and reporting mechanisms. Furthermore, Transparency significantly influenced Citizen Satisfaction ($\beta = 0.61$, $p < 0.001$), suggesting that openness and information accessibility contribute substantially to public trust in government institutions.

Collectively, the SEM results validate the conceptual framework proposed in this study and provide empirical evidence that AI adoption and digital governance improve governance outcomes through multiple interconnected pathways. The findings support previous studies by Mudey et al. (2026),

Setyarto et al. (2025), Erinaldi et al. (2026), and Nwambuko et al. (2025), all of which reported positive effects of digital governance on transparency, accountability, and service delivery.

The technical implication of these findings is that public-sector digital transformation should not focus solely on technology acquisition. Instead, governments should pursue integrated AI-enabled governance ecosystems that simultaneously improve efficiency, transparency, accountability, and service delivery. Such an approach is likely to maximize citizen satisfaction and strengthen overall governance performance.

5.0 Conclusion

This study investigated the influence of Artificial Intelligence (AI) and digital governance on public administration performance, focusing on administrative efficiency, transparency, accountability, service delivery, and citizen satisfaction. The findings revealed high levels of AI utilization among respondents and positive perceptions of digital governance practices within public institutions. Correlation, regression, and structural equation modeling results showed that AI adoption and



digital governance significantly improve administrative efficiency, strengthen transparency and accountability, enhance service delivery, and increase citizen satisfaction.

The study concludes that AI-enabled digital governance is a critical driver of modern public administration. By supporting intelligent decision-making, process automation, and improved information management, AI contributes significantly to better governance outcomes and more citizen-centered public services. The findings further demonstrate that successful digital transformation depends not only on technology adoption but also on institutional readiness, human capacity, and supportive governance frameworks.

Governments should increase investment in AI technologies and digital infrastructure to improve administrative efficiency and service delivery. Public institutions should strengthen staff training and digital literacy programmes to enhance the effective use of emerging technologies. Clear policies and regulatory frameworks should be established to address issues of data security, privacy, accountability, and ethical AI use.

Efforts should also focus on improving interoperability among government agencies and expanding access to digital services, particularly in underserved areas. Finally, continuous evaluation of AI and digital governance initiatives should be encouraged to ensure sustainable improvements in public administration performance and citizen satisfaction.

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Declaration

Ethics Approval and Consent to Participate

Not applicable

Consent for Publication

All authors have read and approved the final version of the manuscript and consented to its publication.

Availability of Data and Materials

Data shall be made available upon request

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Competing Interests

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Authors' Contributions

Ito Umoh contributed to the conception of the study, development of the research framework, literature synthesis, and drafting of key sections including methodology and results interpretation. Emayak Inyang supported questionnaire design, data structuring, statistical analysis, and refinement of theoretical arguments. Both authors collaboratively revised the manuscript, ensured academic rigor, and approved the final version for submission.

