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# ARTIFICIAL INTELLIGENCE IN PUBLIC SERVICE DELIVERY

**OSUEBI KENNETH TASIE, Ph.D**
**Department of Public Administration**
**Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria**
**kenosuebi24@gmail.com**
**ORCID: 0009-0001-8359542X**

**FRANKLINE C.S.A OKEKE, Ph.D**
**Department of Accountancy**
**Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State, Nigeria**
**frankcsa31@gmail.com**
**ORCID: 0000-0002-1781-337X**

**ELIJAH CHINEZIM ONYEAGBA**
**Lecturer, Unizik Business School, Awka, Anambra State, Nigeria**
**elionyeagba@gmail.com**

**&**

**EZEILO CHINONYE B.**
**Department of Accountancy**
**Akanu Ibiam Federal Polytechnic, Unwana, Afikpo, Ebonyi State, Nigeria**

***Abstract***

***Artificial intelligence (AI) has the potential to change how public services are delivered around the world, enabling unprecedented opportunities for both efficiency and citizen engagement, as well as governance innovations. AI adoption in the public sector is accelerating rapidly, particularly in developing economies and Sub-Saharan Africa yet major challenges concerning infrastructure, ethics, regulation and digital inclusion are poorly addressed. This paper reviews the need, benefits and challenges of leveraging Artificial Intelligence (AI) for public service delivery across Nigeria and Africa, as well as implications for policymakers. Utilising a systematic conceptual review method, the study synthesizes peer-reviewed literature. The analysis found AI applications could be transformative in areas like e-governance, citizen engagement, service automation and fraud detection. Despite this, several long-standing challenges such as the digital divide, data biases in ML algorithms and inefficient regulatory frameworks severely inhibit effective AI adoption in the economy. The paper concludes that fulfilling the promise of AI in public service delivery will require policy coordination, an inclusive design orientation, and contextually relevant governance frameworks. It adds to management sciences literature and situates AI adoption in the domain of public administration within guidelines that can be followed by governments, administrators, and management practitioners.***

***Keywords: Artificial Intelligence, Public Service Delivery, E-Governance, Digital Transformation, Nigeria, Public Administration.***

**Introduction**

Artificial intelligence has now emerged as a major disruptive force in public governance and has drastically changed the interface between governments and citizens. Public institutions around the world are using machine learning algorithms, natural language processing systems, robotic process automation, and predictive analytics to simplify bureaucratic procedures, increase service responsiveness, and aid decision-making processes. These developments herald a major break from traditional bureaucratic service models; it is also an indicator of the wider transition towards data-driven and technology-mediated governance.

AI integration into public service delivery has already advanced significantly in developed economies. Estonia, the United Kingdom, China and Singapore have successfully built digital governance systems based on AI that reduce processing time, minimise human error and broaden citizen reach of government services. Visible with human eyes: Estonia, the most ahead digital society cite that its AI-powered X-Road platform which interrelates over 900 government databases and which enables millions of transactional processes per year decreased administrative burden by nearly 35% (Lember et al., 2023). In the same vein, HMRC of the United Kingdom has also implemented AI systems to proactively identify fraudulent tax claims with a 85% accuracy rate, which efficiently lowers revenue losses and demand on manual processing (Budhwar et al., 2023).

In Sub-Saharan Africa, the pattern of AI use in the public sector is drastically different. With a fast-growing digital economy but low mobile internet penetration, structural constraints remain in the way of equitable and widespread integration of AI into government service delivery. Nigeria, the biggest economy and most populous country in Africa, is perhaps the best example of these contradictions. With its National Identity Management Commission (NIMC) digital identity system and the Lagos State chatbot complaint management platform, the country has also come a long way in digital governance. However, sluggish infrastructure development, poor digital literacy and the lack of a well thought out national AI regulatory framework restrain broad-based and equitable AI-enabled public services (Okunola et al., 2023).

The intersection of management sciences and AI governance represents an emerging area of scholarly inquiry that demands rigorous engagement. Public administrators, policy practitioners, and management scholars must grapple with not only the technical dimensions of AI deployment but also its organisational, ethical, and societal implications. The conference theme of bridging artificial intelligence and management sciences for economic growth and organisational transformation provides a timely framework for this examination.

This paper pursues four primary objectives. First, it conceptualises the relationship between AI and public service delivery. Second, it reviews existing empirical evidence on AI applications in public administration globally and in African contexts. Third, it analyses the ethical, infrastructural, and regulatory challenges that constrain effective AI deployment. Fourth, it proposes a set of actionable policy recommendations for governments, public administrators, and management practitioners. The paper is structured as follows: conceptual clarifications, theoretical framework, literature review, methodology, discussion of findings, policy implications, and conclusion.

The significance of this inquiry extends beyond academic interest. Across Nigeria, millions of citizens interact daily with government agencies for identity registration, tax compliance, health service access, licensing, and social protection. The quality, equity, and responsiveness of these interactions shape public trust, economic participation, and social cohesion. When AI systems accelerate and improve these processes, the benefits are not merely administrative but profoundly developmental. Conversely, when AI is deployed without adequate safeguards, the consequences fall disproportionately on those already excluded from the digital economy. Understanding how to harness AI for inclusive public service delivery is therefore both a scholarly imperative and a matter of urgent practical governance concern, particularly in a country of Nigeria's demographic scale and developmental complexity (Nwafor and Chukwu, 2024).

It is also worth noting that the study of AI in public service delivery sits at the confluence of several academic disciplines, including information systems, public administration, political science, economics, and management. This interdisciplinary nature is both a strength and a challenge. It demands that researchers resist narrow disciplinary framings and instead engage with the full complexity of how technology, institutions, politics, and society interact in producing public service outcomes. The management sciences, with their emphasis on organisational performance, strategic decision-making, human resource development, and institutional design, offer particularly relevant conceptual tools for this examination. This paper embraces that interdisciplinary orientation throughout its analysis.

## Conceptual Clarifications

### Artificial Intelligence

Artificial intelligence refers to the capacity of computational systems to perform tasks that ordinarily require human cognitive abilities, including reasoning, learning, perception, language understanding, and problem-solving. Contemporary AI encompasses a spectrum of technologies: machine learning (the capacity of systems to learn from data without explicit programming), natural language processing (enabling machines to understand and generate human language), computer vision (interpreting visual data), robotic process automation (automating rule-based administrative tasks), and predictive analytics (forecasting outcomes from historical data patterns). Wirtz et al. (2022) define AI in the public sector context as the application of intelligent systems to automate, augment, or advise on governmental functions and citizen-facing service processes.

### Public Service Delivery

Public service delivery refers to the mechanisms through which governments provide services, goods, information, and regulatory functions to citizens. These services span health administration, tax collection, social welfare distribution, identity management, licensing, security, and civic participation. Effective public service delivery is characterised by accessibility, efficiency, accountability, transparency, and equity. Twizeyimana and Andersson (2022) note that the quality of public service delivery is a primary determinant of citizen trust in government and a central metric of governance performance in both developed and developing state contexts.

In the context of developing economies, public service delivery faces structural challenges that go beyond mere administrative inefficiency. Inadequate funding, weak institutional capacity, corruption, geographic inaccessibility, and fragmented accountability systems have historically limited the reach and quality of government services. These conditions define the environment into which AI technologies are being introduced, and they fundamentally shape what AI can achieve and for whom. Scholars such as Okunola et al. (2023) caution against uncritical optimism, arguing that technology adoption in governance must be situated within the political economy of the state and must account for the power dynamics that determine who gains and who loses when services are 52organized around digital platforms.

**The AI-Public Service Interface**

The integration of AI into public service delivery creates a dynamic interface where technological systems mediate citizen-government interactions. This interface spans front-end service channels (chatbots, digital portals, mobile applications), middle-office functions (case management, document processing, decision support), and back-office operations (fraud detection, data analytics, policy modelling). Figure 1 illustrates this interface across service domains.

| AI TECHNOLOGIES | INTERFACE | PUBLIC SERVICE DELIVERY |
|---|---|---|
| Machine Learning | <<>> | Health Services |
| Natural Language Processing | <<>> | Tax and Revenue Administration |
| Robotic Process Automation | <<>> | Social Welfare and Benefits |
| Predictive Analytics | <<>> | Licensing and Registration |
| Computer Vision / Biometrics | <<>> | Security and Identity Verification |

**Figure 1:** The AI-Public Service Delivery Interface: Technologies and Service Domains

**Theoretical Framework**

This paper is anchored in the Technology Acceptance Model (TAM), originally developed by Davis (1989) and subsequently extended by numerous scholars to accommodate public sector and developing country contexts. TAM posits that technology adoption is shaped primarily by two perceptual variables: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness captures the degree to which an individual believes that using a particular system enhances performance, while perceived ease of use refers to the degree to which using the system is free of effort. Both variables influence attitude toward use, which in turn predicts behavioural intention and actual system adoption.

In the context of AI-enabled public service delivery, TAM has been adapted by several scholars to incorporate external variables specific to public administration environments.

Budhwar et al. (2023) extend the model to include institutional trust and regulatory environment as antecedents of AI acceptance among public servants. Okunola et al. (2023) apply TAM to the Nigerian biometric identity context, demonstrating that perceived usefulness is moderated by infrastructure quality and digital literacy. Lember et al. (2023) further adapt the model for cross-national comparative studies, adding government transparency and citizen participation as moderating variables.

For this study, TAM is adapted to reflect the multi-layered context of AI adoption in public service delivery. External variables include AI system quality, government policy, digital infrastructure, and citizen demographics. These shape perceptions of usefulness and ease of use among both citizens and public servants, ultimately determining the extent and equity of AI system adoption. Figure 2 presents this adapted framework.

| TECHNOLOGY ACCEPTANCE MODEL (TAM) - AI in Public Service Adaptation |
|---|
| External Variables: AI System Quality \| Government Policy \| Digital Infrastructure \| Citizen Demographics |
| Perceived Usefulness (PU): Citizens/Officials believe AI improves service speed, accuracy, and accessibility |
| Perceived Ease of Use (PEOU): AI interfaces are intuitive, accessible, and require minimal technical skill |
| Attitude Toward Use: Positive or negative predisposition toward AI-enabled public services |
| Behavioural Intention to Use: Willingness to engage with AI service channels over traditional options |
| Actual AI System Use: Adoption of AI platforms (portals, chatbots, automated systems) for public services |

**Figure 2:** Adapted Technology Acceptance Model (TAM) for AI in Public Service Delivery

## Literature Review

### Global AI Applications in Public Service

The empirical literature on AI in public administration reflects a rapidly expanding body of scholarship that spans automation, citizen engagement, fraud detection, predictive governance, and smart city management. Wirtz et al. (2022) provide a comprehensive review of AI applications in European public administrations, finding that chatbot deployment in municipal service portals reduced citizen response times by up to 70% while improving satisfaction scores across multiple service categories. The study identifies service automation and digital channel integration as the two dimensions most consistently associated with efficiency gains.

In the Asia-Pacific region, Chen et al. (2023) analyse smart city AI implementations across China, finding that platforms integrating AI-enabled service windows achieved a 60% reduction

in administrative processing time across health registration and business licensing departments. Singapore's National AI Strategy provides a complementary case, where AI is deployed across 25 government agencies to personalise citizen service journeys and optimise resource allocation in transport, health, and housing sectors.

The United States presents a more complex picture. Federal agencies such as the Social Security Administration and the Internal Revenue Service have piloted AI-assisted case processing and fraud detection tools, achieving measurable efficiency improvements. However, Meijer and Wessels (2021) document significant public concern over algorithmic decision-making in benefits administration, particularly where automated systems have incorrectly denied or delayed welfare claims. These cases have spurred legislative action at state level, with several US states enacting algorithmic accountability laws requiring human review of AI decisions affecting citizen entitlements. The US experience illustrates a recurring tension in the AI-in-government literature: the efficiency gains of automation and the accountability requirements of democratic governance do not always align, and resolving that tension demands deliberate institutional design rather than technical optimisation alone.

In the health administration domain, AI has demonstrated particular promise. Predictive analytics systems deployed in European national health services have improved patient appointment scheduling, reduced diagnostic wait times, and optimised hospital resource allocation. Wirtz et al. (2022) report that AI-assisted triage tools in several German municipalities reduced emergency response processing time by up to 45%, with downstream benefits for patient outcomes and system cost efficiency. These health applications point toward the broader potential of AI not merely as an administrative convenience but as an instrument of substantive service quality improvement with direct consequences for citizen welfare.

**AI in African and Nigerian Public Service Contexts**

Within Africa, the diffusion of AI in public service delivery is uneven and context-dependent. Kenya's eCitizen platform, enhanced with AI-assisted query handling, has reduced business registration processing from seven days to under 24 hours, demonstrating the transformative potential of AI even in infrastructure-constrained environments. Rwanda's Irembo platform has digitised over 100 government services, with AI components facilitating service routing, fraud detection, and citizen feedback analysis (Meijer and Wessels, 2021).

In Nigeria, the evidence base is growing but remains limited relative to the country's scale and governance complexity. Okunola et al. (2023) document the mixed outcomes of NIMC's AI-assisted biometric identity verification system, finding that while urban uptake was strong, rural populations, particularly older women and persons with disabilities, faced systematic exclusion due to biometric data quality issues and geographic service gaps. Nwafor and Chukwu (2024) evaluate Lagos State's chatbot complaint management system and report a 40% reduction in processing backlogs but note significant public resistance rooted in distrust of government technology initiatives.

Beyond Nigeria, South Africa offers instructive lessons. The State Information Technology Agency (SITA) has piloted AI-assisted citizen service routing and query management systems, achieving improvements in service channel efficiency. However, Twizeyimana and Andersson (2022) observe that South Africa's relatively advanced digital infrastructure has not translated

into equitable AI-enabled service access, with township communities and rural populations systematically underserved. This observation challenges the assumption that infrastructure investment alone resolves digital exclusion; governance choices about system design, language access, and community engagement are equally determinative of whether AI benefits are broadly shared.

Ghana presents a contrasting, more encouraging trajectory. The Ghana Revenue Authority's deployment of AI-powered tax compliance monitoring between 2021 and 2023 contributed to a measurable increase in voluntary tax compliance among small and medium enterprises. The system's success was attributed partly to its design, which incorporated Ghanaian languages and simplified interfaces, reducing the linguistic and cognitive barriers that frequently limit technology adoption among low-literacy populations. This case suggests that contextually sensitive AI design can achieve meaningful results even within constrained infrastructure environments, and it offers a replicable model for Nigeria and other West African states (Lember et al., 2023).

**Identified Gaps in the Literature**

Despite the growing body of research, several critical gaps persist. First, longitudinal studies examining the sustained impact of AI on public service quality and citizen trust are scarce. Most existing studies capture short-term efficiency gains without tracking behavioural change or institutional adaptation over time. Second, comparative studies that systematically examine AI adoption across different income-level and governance-quality contexts remain limited, making cross-country policy learning difficult. Third, the behavioural dimensions of AI acceptance within Nigerian and broader West African public administration contexts are underexplored. Fourth, ethical governance frameworks specifically designed for AI deployment in resource-constrained public sector environments are largely absent from the literature. Table 1 presents a synthesis of key empirical studies reviewed.

**Table 1:** Summary of Selected Empirical Studies on AI in Public Service Delivery

| Author(s) & Year | Context/Country | Key Findings | Identified Gap |
|---|---|---|---|
| Wirtz et al. (2022) | Germany / Global | AI chatbots in public administration reduced response times by up to 70% while improving citizen satisfaction scores across municipal service portals. | Limited longitudinal data on sustained citizen trust. |
| Budhwar et al. (2023) | United Kingdom | Machine learning systems in UK revenue services detected fraudulent tax claims with 85% accuracy, outperforming traditional rule-based screening methods. | Ethical governance frameworks for AI decision errors remain underdeveloped. |

| Author(s) & Year | Context/Country | Key Findings | Identified Gap |
|---|---|---|---|
| Twizeyimana & Andersson (2022) | Sweden / East Africa | E-government platforms integrating AI components expanded service reach in rural communities but faced low adoption due to digital literacy barriers. | Comparative studies across income-level contexts are scarce. |
| Okunola et al. (2023) | Nigeria | AI-driven NIMC digital identity systems improved verification speed but suffered from biometric exclusion of older rural populations. | Infrastructure inequalities undermine uniform service delivery outcomes. |
| Nwafor & Chukwu (2024) | Nigeria | Chatbot-assisted citizen complaint systems in Lagos State reduced processing backlogs by 40% but encountered public resistance linked to distrust of government technology. | Behavioural dimensions of AI acceptance in Nigerian public sector are underexplored. |
| Meijer & Wessels (2021) | Netherlands | Predictive policing algorithms improved resource allocation in urban centres but introduced racial profiling biases, triggering policy reversal. | Accountability mechanisms for AI errors in law enforcement require statutory backing. |
| Chen et al. (2023) | China / Asia-Pacific | Smart city platforms using AI-integrated service windows achieved 60% reduction in administrative processing time across health and licensing departments. | Data sovereignty and cross-border AI governance remain unresolved. |
| Lember et al. (2023) | Estonia | Estonia's AI-driven digital government model reduced administrative burden by 35% while maintaining high transparency scores in citizen surveys. | Transferability of the Estonian model to developing country contexts needs examination. |

***Note.*** *Compiled by the authors from reviewed literature (2021-2024).*

## Methodology

This study adopts a systematic conceptual review methodology, a well-established approach in management and public administration scholarship for synthesising dispersed empirical knowledge and developing theoretical contributions (Lember et al., 2023; Twizeyimana

and Andersson, 2022). The methodology is appropriate given that this paper aims to map the existing knowledge landscape, identify patterns across empirical studies, and generate policy-relevant insights rather than produce primary empirical data.

The literature search was conducted across five major academic databases: Scopus, Web of Science, Google Scholar, PubMed/DOAJ, and IEEE Xplore. Search terms were constructed around three conceptual clusters: artificial intelligence and its specific sub-technologies; public service delivery and e-governance; and geographic contexts including Nigeria, Africa, and developing countries. Boolean operators combined these clusters systematically. The search was restricted to publications from January 2020 to May 2026 to ensure currency and relevance.

Inclusion criteria required that articles: (i) address AI applications, policies, or outcomes in public sector or governance contexts; (ii) present empirical findings, systematic reviews, or substantive theoretical contributions; (iii) be published in peer-reviewed journals, edited volumes, or credible institutional reports; and (iv) be written in English. Articles focused exclusively on private sector AI applications, medical AI systems unrelated to public administration, or AI in purely technical engineering contexts were excluded. Table 2 summarises the search strategy and article selection outcomes.

**Table 2**: Summary of Literature Search and Selection Criteria

| Database | Search Terms | Articles Retrieved | Articles Included |
|---|---|---|---|
| Scopus | Artificial intelligence AND public service delivery | 312 | 38 |
| Web of Science | AI AND e-government AND citizen services | 274 | 29 |
| Google Scholar | AI public administration Nigeria Africa 2020-2026 | 510 | 44 |
| PubMed / DOAJ | Digital governance AND AI AND developing countries | 189 | 17 |
| IEEE Xplore | Smart government AND machine learning AND Africa | 143 | 12 |
| Total | | 1,428 | 140 (after deduplication: 89 retained) |

***Note.*** *Search conducted January-May 2026 across listed databases.*

Following initial retrieval, titles and abstracts were screened for relevance, with full-text review conducted for all potentially eligible studies. Eighty-nine articles were retained after deduplication and quality screening. Data were extracted under thematic categories

corresponding to the paper's analytical sections: AI applications and efficiency, citizen engagement tools, ethical challenges, infrastructure constraints, and regulatory frameworks. Thematic synthesis was conducted inductively, allowing patterns, contradictions, and gaps to emerge from the data rather than being imposed by a pre-existing coding framework (Chen et al., 2023).

**Discussion of Findings**

**AI-Driven Automation and Service Efficiency**

The evidence across reviewed studies consistently demonstrates that AI-driven automation generates measurable efficiency gains in public service delivery contexts. Automation of routine administrative tasks, including document verification, application processing, data entry, and service routing, reduces processing times, minimises human error, and frees public servants for higher-complexity functions requiring judgment and discretion. Across the seven country contexts synthesised in Figure 3, efficiency gains range from 35% to 60% reductions in administrative processing time, with the most dramatic gains observed in digitally mature environments such as Estonia and China.

| Country / Context | Efficiency Gain Reported | Service Domain |
|---|---|---|
| Estonia (X-Road AI) | 35% reduction in processing time | Multi-sector digital government |
| United Kingdom (HMRC AI) | 30% reduction in call centre volume | Tax and compliance |
| China (Smart City AI) | 60% reduction in admin processing | Health, licensing, transport |
| Lagos, Nigeria (LASG Chatbot) | 40% reduction in complaint backlogs | Citizen complaint management |
| Kenya (eCitizen AI) | Processing: 7 days to under 24 hours | Business registration |
| India (UMANG AI) | 1,900+ services on one platform | Multi-sector public services |
| Rwanda (Irembo AI) | 100+ services digitized | Health, land, transport |

**Figure 3:** *Reported Efficiency Gains from AI Deployment in Public Service Delivery Across Selected Contexts*

**Source:** Compiled from reviewed literature: Wirtz et al. (2022); Budhwar et al. (2023); Lember et al. (2023); Chen et al. (2023); Nwafor and Chukwu (2024); Okunola et al. (2023).

In the Nigerian context, automation gains are more modest and contextually constrained. The Lagos State chatbot system achieved a 40% reduction in complaint backlogs, a significant operational improvement, yet this outcome was realised in an urban, relatively well-connected

environment with the institutional capacity to sustain the technology (Nwafor and Chukwu, 2024). Scaling similar outcomes to rural local government areas, where electricity supply is unreliable and internet connectivity is sparse, presents a fundamentally different governance challenge. This divergence underscores the critical importance of contextual analysis in AI policy design.

**AI in Citizen Engagement and Feedback Systems**

Beyond back-office automation, AI is transforming the citizen-facing dimensions of public service delivery through chatbots, personalised service portals, sentiment analysis of citizen feedback, and predictive demand modelling. These tools shift the paradigm of public administration from reactive and standardised service provision toward responsive, personalised, and anticipatory governance. Table 3 documents AI-powered citizen engagement tools across eight country contexts, illustrating the breadth of applications and the diversity of reported outcomes.

**Table 3:** *AI-Powered Citizen Engagement Tools Across Selected Country Contexts*

| Country | AI Tool/Platform | Service Domain | Outcome Reported |
|---|---|---|---|
| Estonia | X-Road / Kratt AI | Tax, health, licensing | 35% reduction in processing time; 90%+ digital transaction rate |
| United Kingdom | HMRC Chatbot (HMRC Digital) | Tax enquiries and compliance | 85% fraud detection accuracy; reduced call centre volume by 30% |
| Nigeria (Lagos) | Chatbot Complaint System (LASG) | Citizen complaints and feedback | 40% reduction in complaint backlogs; mixed public reception |
| China | Alipay Government Mini-Programs | Health, transport, social welfare | 60% reduction in administrative processing across smart cities |
| India | UMANG / DigiLocker AI | Identity, education, health | Over 1,900 government services accessible via single AI platform |
| Kenya | eCitizen with AI query handling | Business registration, licensing | Processing time cut from 7 days to under 24 hours |
| South Africa | SITA AI Portal | Government IT and citizen interface | Improved service routing; digital divide remains a major constraint |
| Rwanda | Irembo Platform (AI-enhanced) | Health, land, transport | Over 100 government services digitised; rural access remains limited |

***Note.*** *Compiled from reviewed empirical literature and institutional reports (2021-2024).*

Wirtz et al. (2022) report that AI chatbots in European municipalities significantly improved first-contact resolution rates, reducing the need for citizens to escalate queries to human agents. India's UMANG platform demonstrates the scalability potential of AI citizen

engagement at national scale, aggregating over 1,900 government services on a single AI-assisted interface. In the African context, Rwanda's Irembo and Kenya's eCitizen represent encouraging models, though Meijer and Wessels (2021) caution that rural access gaps and language diversity continue to limit the inclusivity of AI-mediated citizen engagement across the continent.

**Ethical Concerns: Bias, Accountability, and Exclusion**

The deployment of AI in public service delivery raises fundamental ethical questions that the reviewed literature addresses with increasing urgency. Algorithmic bias, arising from training data that reflects historical inequalities, represents the most extensively documented ethical risk. Meijer and Wessels (2021) document the reversal of a predictive policing algorithm in the Netherlands following evidence that it systematically disadvantaged ethnic minority communities, illustrating the real-world harm potential of unchecked algorithmic deployment in high-stakes governance contexts. Figure 4 maps the ethical risk dimensions identified across the reviewed literature.

| ETHICAL RISK DIMENSION | DESCRIPTION | SEVERITY |
|---|---|---|
| Algorithmic Bias | AI systems trained on unrepresentative data produce discriminatory outputs, disproportionately excluding marginalised populations. | High |
| Accountability Deficit | When AI makes erroneous public service decisions, it is often unclear which actor (developer, agency, government) bears responsibility. | High |
| Data Privacy Violations | Large-scale citizen data collection for AI training creates risks of surveillance overreach and unauthorised secondary use. | High |
| Digital Exclusion | Citizens without internet access, digital devices, or digital literacy are excluded from AI-mediated public services. | Medium-High |
| Lack of Transparency | Black-box AI models operate without explainability, making it difficult for citizens or officials to understand or challenge decisions. | High |
| Dependency and Deskilling | Over-reliance on AI erodes public servants' professional judgment and institutional memory. | Medium |

**Figure 4:** *Ethical Risk Dimensions of AI in Public Service Governance*
**Source**: Compiled by the authors from reviewed literature on AI ethics and public administration.

Accountability deficits are particularly acute in public sector AI deployment. When AI systems make erroneous decisions affecting citizens' access to benefits, identity verification, or regulatory compliance, the diffusion of responsibility across developers, procurement officials, system operators, and political principals creates a governance vacuum that existing legal frameworks are ill-equipped to address. Budhwar et al. (2023) argue that the absence of statutory accountability frameworks for AI-assisted public decisions represents the most significant ethical governance gap in contemporary public administration.

The transparency deficit in AI-aided governance warrants particular attention. Many AI systems deployed in public service contexts operate as black-box models, producing outputs without comprehensible explanations. This opacity is fundamentally incompatible with the principles of open government and administrative due process that underpin democratic governance. Citizens denied a benefit, rejected for a licence, or flagged as a fraud risk by an AI system have a legitimate expectation that the decision can be explained, challenged, and reviewed. Where AI systems cannot provide that explanation, the entire edifice of administrative justice is compromised. The European Union's AI Act, which came into partial effect in 2024, establishes explainability requirements for high-risk AI applications in public administration, setting a regulatory precedent that African governments would do well to study and adapt (Chen et al., 2023).

In the Nigerian and broader African context, digital exclusion emerges as a compounding ethical concern. AI systems that are accessible only to urban, educated, digitally literate citizens systematically reproduce and potentially deepen existing socioeconomic inequalities. Okunola et al. (2023) document how NIMC's biometric system excluded rural women and elderly populations, producing an identity verification gap with downstream consequences for access to financial services, social protection, and electoral participation.

**Infrastructure and Digital Divide Constraints**

The deployment of AI in public service delivery is fundamentally conditioned by the quality and distribution of digital infrastructure. Broadband connectivity, reliable electricity supply, device ownership, and cloud computing capacity are necessary preconditions for functional AI systems, and deficits in any of these dimensions constrain the scope, reach, and equity of AI-enabled governance. Figure 5 presents comparative data on internet penetration, mobile broadband access, and AI readiness across Sub-Saharan African countries, contextualising Nigeria's infrastructure position relative to continental and global benchmarks.

| Country | Internet Penetration (%) | Mobile Broadband Access (%) | AI Readiness Index (0-10) |
|---|---|---|---|
| South Africa | 72.3 | 68.1 | 5.8 |
| Kenya | 42.5 | 45.2 | 4.6 |
| Ghana | 53.0 | 49.7 | 4.1 |
| Nigeria | 36.8 | 34.2 | 3.7 |
| Ethiopia | 22.1 | 20.5 | 2.9 |
| Niger | 10.4 | 9.8 | 1.8 |
| **Sub-Saharan Africa Average** | **36.0** | **33.5** | **3.5** |
| **Global Average (2024)** | **67.4** | **64.2** | **6.2** |

**Figure 5:** *Internet Penetration, Mobile Broadband Access, and AI Readiness in Sub-Saharan Africa*
**Sources**: International Telecommunication Union (2024); Oxford Insights Government AI Readiness Index (2024).

At 36.8% internet penetration and an AI Readiness Index score of 3.7, Nigeria sits below the sub-Saharan African average and far below the global benchmark. This infrastructure context has direct implications for AI public service deployment: systems designed for high-connectivity environments will systematically underserve the majority of Nigerians who remain offline or poorly connected. Twizeyimana and Andersson (2022) emphasise that the digital divide is not merely a technical problem but a governance challenge requiring deliberate public investment, regulatory incentivisation of private infrastructure expansion, and community-level digital inclusion programmes.

**Regulatory and Policy Gaps in Nigeria and Africa**

The regulatory landscape for AI in Africa remains nascent and fragmented. While the African Union adopted its Continental AI Strategy in 2024 and Nigeria enacted the Nigeria Data Protection Act in 2023, comprehensive national AI governance frameworks that address accountability, algorithmic auditing, procurement standards, and citizen redress remain absent in most African states. Nwafor and Chukwu (2024) identify Nigeria's regulatory vacuum as a primary constraint on responsible AI adoption, noting that without binding standards, public agencies lack guidance on ethical AI procurement and deployment.

The absence of coordinated regulatory frameworks also creates risks of policy misalignment, where AI systems procured from international vendors may not align with domestic values, privacy norms, or governance priorities. Chen et al. (2023) warn that uncritical technology transfer from data-rich developed country contexts to data-poor developing country environments can produce AI systems that perform poorly and generate exclusionary outcomes when deployed at scale.

Nigeria's National Information Technology Development Agency (NITDA) issued a National AI Policy Framework in 2023, signalling governmental recognition of the need for coordinated AI governance. However, stakeholders within the technology and civil society communities have noted that the framework lacks enforcement mechanisms, dedicated funding, and institutional structures for implementation. Without these, the policy risks remaining an aspirational document rather than an operational governance tool. This gap between policy intent and institutional capacity is a recurring feature of Nigerian technology governance and one that demands deliberate attention from both government and management practitioners (Nwafor and Chukwu, 2024).

Procurement practices represent an underexamined dimension of the regulatory challenge. Public agencies in Nigeria and across Africa frequently procure AI systems through opaque competitive tendering processes that prioritise cost over ethical compliance, local adaptability, or transparency. Vendors from China, the United States, and Europe supply AI tools designed for high-income, high-data environments, and these tools are deployed in radically different sociotechnical contexts with minimal adaptation. The result is frequently a mismatch between system capability and governance need. Establishing binding AI procurement standards, including requirements for local data testing, bias auditing, and vendor accountability provisions, represents a critical regulatory priority for Nigerian authorities seeking to ensure that AI adoption delivers genuinely public value rather than merely modernising the surface appearance of service delivery (Lember et al., 2023).

**Policy and Practical Implications**

The findings of this review carry significant implications for governments, public administrators, management practitioners, and regulatory authorities across Nigeria and the broader African region. Table 4 maps specific policy recommendations to the challenges identified in the preceding discussion, providing a structured framework for practical action.

**Table 4:** Policy Recommendations Mapped to Identified Challenges in AI-Enabled Public Service Delivery

| Identified Challenge | Policy Recommendation | Responsible Actor |
|---|---|---|
| Digital infrastructure deficits in rural areas | Prioritise broadband expansion under national digital economy policies and ring-fence AI infrastructure funds in annual budgets. | Federal and state governments; NCC |
| Low digital literacy among citizens and public servants | Institutionalise AI and digital skills curricula in civil service training programmes and partner with universities for public education. | Ministries of Education and Communication |
| Absence of AI governance and regulatory frameworks | Enact a dedicated National AI Policy with binding ethical standards, audit requirements, and citizen redress mechanisms. | National Assembly; NITDA; Presidency |
| Algorithmic bias and exclusion risks | Mandate independent algorithmic impact assessments before deployment of AI tools in public service contexts. | NITDA; Independent Regulatory Bodies |
| Public distrust of government AI systems | Implement participatory co-design of AI public services, involving civil society, professional bodies, and citizens in design and oversight. | MDAs; Civil Society Organisations |
| Data protection and privacy vulnerabilities | Strengthen enforcement of the Nigeria Data Protection Act (2023) and establish a fully operational Data Protection Commission. | NDPC; Federal Ministry of Justice |

***Note.*** *MDAs = Ministries, Departments, and Agencies; NCC = Nigerian Communications Commission; NITDA = National Information Technology Development Agency; NDPC = Nigeria Data Protection Commission.*

From a management sciences perspective, the integration of AI into public service delivery demands new competencies from public administrators, including data literacy, AI ethics awareness, and human-machine collaboration skills. Professional development frameworks for public servants must evolve to accommodate these demands. Universities, including institutions such as Alex Ekwueme Federal University, have a critical role to play in producing graduates who can navigate the intersection of AI and public administration, design inclusive AI systems, and provide evidence-based policy advice.

Participatory and co-design approaches offer a particularly promising pathway for building public trust in AI-enabled services. When citizens are meaningfully involved in the

design, testing, and evaluation of AI public service systems, adoption is more likely to be equitable, trust more durable, and ethical risks more effectively anticipated and mitigated (Meijer and Wessels, 2021). Nigerian public agencies should establish citizen advisory panels for AI system deployments, particularly in high-stakes domains such as social welfare, health, and identity management.

The human resource dimensions of AI integration in public service are equally consequential and deserve dedicated attention from management scholars and practitioners. The deployment of AI in government agencies does not simply replace manual tasks; it reshapes the nature of work, the skill profiles required, and the distribution of decision-making authority within organisations. Public servants whose roles are automated or augmented by AI must be supported through active workforce transition programmes, retraining initiatives, and career pathway redesign. Failure to manage this transition humanely and strategically risks not only individual hardship but also institutional resistance that can undermine AI implementation altogether (Budhwar et al., 2023). Human resource management frameworks for the AI transition in Nigerian public service represent a significant gap in current policy thinking and an important opportunity for management sciences scholarship.

International development partners, including the World Bank, the African Development Bank, and bilateral donors, also have a role to play in enabling responsible AI adoption in Nigerian public service. Development finance can support infrastructure investment, institutional capacity building, regulatory framework development, and knowledge exchange with more advanced AI governance contexts. However, development partners must resist the temptation to drive AI adoption agendas that reflect their own technological preferences or vendor relationships rather than the priorities and capabilities of recipient governments. Locally anchored, government-owned AI strategies, supported but not determined by international partners, are more likely to produce sustainable and equitable public service outcomes in the Nigerian context (Twizeyimana and Andersson, 2022).

**Conclusion**

This paper has examined the opportunities, challenges, and policy implications of artificial intelligence in public service delivery, with particular attention to the Nigerian and Sub-Saharan African contexts. Drawing on a systematic review of 89 peer-reviewed studies published between 2020 and 2026, the paper demonstrates that AI holds transformative potential for public administration, from automating routine processes and reducing backlogs to enabling personalised citizen engagement and improving fraud detection. At the same time, the evidence reveals that realising this potential is contingent on addressing a complex web of structural, ethical, and regulatory constraints.

The adapted Technology Acceptance Model applied in this study provides a useful theoretical lens for understanding how infrastructure quality, government policy, citizen demographics, and perceptions of AI systems shape adoption outcomes. The policy recommendations advanced in this paper emphasise the need for coordinated investment in digital infrastructure, contextually appropriate regulatory frameworks, inclusive design approaches, and capacity development for public servants and citizens alike.

A central argument of this paper is that AI is not a technical solution to governance problems but rather a governance challenge in its own right. The decisions made about which AI systems to deploy, in which service domains, designed by whom, for whom, and subject to what oversight, are political and managerial decisions with profound distributional consequences. Management scientists, public administrators, and policy practitioners must therefore engage with AI not as passive recipients of technology but as active architects of the governance frameworks within which technology operates. The institutional design of AI-enabled public service, including accountability mechanisms, citizen redress procedures, workforce transition plans, and ethical oversight structures, is as important as the technical quality of the AI systems themselves.

The convening of this international hybrid conference at Alex Ekwueme Federal University reflects a growing recognition within Nigerian higher education and the broader management sciences community that AI is not a peripheral concern but a central one. Universities have a responsibility not only to produce graduates capable of operating in AI-transformed workplaces but also to generate the scholarship, policy analysis, and ethical reflection that equip governments and institutions to govern AI responsibly. This paper is a contribution to that project, and the authors hope it stimulates further empirical investigation, policy engagement, and scholarly dialogue on one of the most consequential governance challenges of the present era.

This study is not without limitations. The reliance on published empirical literature may exclude grey literature, government reports, and unpublished evaluations that contain valuable operational insights. The heterogeneity of study contexts and methodologies also limits the precision of cross-context comparisons. Future research should prioritise longitudinal studies that track AI public service outcomes over time, primary empirical investigations of citizen and public servant AI acceptance in Nigerian contexts, and comparative policy analyses across African governance systems. As AI continues to evolve rapidly, the management sciences community must remain engaged with the governance, ethical, and equity dimensions of its deployment in the public interest.

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