



Artificial Intelligence and the Future of Human Resources Management in Nigeria Public Sector: Opportunities, Challenges and Administrative Implications

By

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Abstract

With widespread advances in artificial intelligence globally, human resource management (HRM) practices are undergoing a fundamental digital transformation. However, little discourse has examined how artificial intelligence can be applied in public service in Nigeria. Given the widespread inefficiency in HRM practices in Nigeria, led by flaws in recruitment, performance appraisal, talent retention, and workforce planning, coupled with bureaucratic diseconomies and austerity measures from the government, there is a need to make use of digitally enabled HRM solutions. This paper examines the opportunities, challenges, and administrative implications of adopting artificial intelligence in Nigeria's public administration HRM, along with the policy options these raise. It conceptualises technological readiness, data quality, leadership buy-in and the regulatory environment as independent variables that shape AI integration pathways across core HR functions, with public-sector efficiency, equity, employee experience and service delivery performance as dependent variables, mediated by those integration pathways and moderated by ethical governance and change-management capacity. Based on socio-technical systems and technology-organization-environment approaches, this research adopts a mixed-methods design, involving interviews with senior public service HR and ICT policymakers in selected federal and state government ministries, departments, and agencies (MDAs), complemented by a structured questionnaire for mid- and senior-level public servants in those MDAs. The research contributes to knowledge on the cautious pattern of AI experimentation (from automation in hiring to biometrics), hindered by data and skills gaps, concerns about algorithmic ethnic and geopolitical bias, and bureaucratic politics. Conceptually, this paper contributes to digital PDA thought in a managerialist, pluralist, and neglected Global South bureaucratic context; practically, it sketches out an incremental pathway to AI integration. Policy proposals include national standards for AI ethics in government; mandatory impact assessments of algorithmic ethnic and geopolitical bias; state-sponsored training for public officials; and institutions that encourage experimentation, accountability, transparency, fairness, and public service values.

Keywords: Artificial Intelligence; Human Resource Management; Public Sector; Digital Transformation; Nigeria; Workforce Analytics; Algorithmic Decision-Making; Public Service Delivery

1. Introduction

The fourth industrial revolution has introduced artificial intelligence into the day-to-day functioning of organizations worldwide. Artificial intelligence includes applications such as machine learning, natural language processing, predictive analytics and robotic process automation. These applications are quite different from traditional HRIS as they not only do not adopt record-keeping approaches, but also perform more advanced tasks such as inputting and analysing data organisations in many countries use artificial intelligence for many HR functions, including screening job applications, predicting employee attrition, customizing training and supporting performance appraisals (Bondarouk & Brewster, 2016; Strohmeier & Pioza, 2015). This technology is being adopted rapidly because it enables faster, large-scale data processing than manual methods, improves accuracy, and allows HR professionals to shift from administrative work to strategic planning.

Nigeria's public sector employs roughly 2.6 million people, making it one of the larger public workforces in Africa (International Labour Organization, 2023). The sector operates under the federal character principle, which requires fair representation of different states and ethnic groups in appointments and promotions. This often runs alongside (but contrasts with) pre-existing bureaucratic inertia, slow decision-making, and weak performance management systems. At the same time, the National Digital Economy Policy and Strategy (2020–2030) has promoted greater use of digital tools, including emerging ones, to improve government services and build digital jobs (Federal Ministry of Communications and Digital Economy, 2020). More recently, Nigeria launched the National Artificial Intelligence Strategy (Federal Ministry of Communications, Innovation and Digital Economy, 2025), positioning artificial intelligence as a means of catalyzing public-sector innovation and skills building.

Despite these policy signals, recruitment, performance appraisal, talent retention and workforce planning in the Nigerian public sector continue to face serious inefficiencies. Fiscal limits and a large, young population add further strain. While private organisations in Nigeria have begun to adopt artificial intelligence tools for human resource tasks, systematic evidence on readiness, barriers and actual use inside public ministries, departments and agencies remains scarce. Most existing studies focus either on private firms or on countries in the Global North, leaving a clear gap in understanding how artificial intelligence can work within Nigeria's specific public-service rules and culture (Nwambuko, 2025; Ademeso et al., 2025).

A recent comparative study on Africa shows that AI adoption for human resource management remains in its early stages across the continent. Much remains to be done to boost all nations' capacity, including through infrastructure investments, artificial intelligence literacy programmes for human resource practitioners and strengthened institutions; this is despite some early attempts by South Africa, Kenya and Rwanda to experiment with digital-based tools for public administration (Chilunjika et al., 2022; Owor et al., 2025). While technology is crucial, these lessons point to the importance of organisational capacity, organisational values, and robust regulatory systems. Nigeria's case study is thus useful for studying a large, diverse and federal public administration that wants to deploy artificial intelligence in a manner consistent with public-service values. Accordingly, this paper examines the opportunities that artificial intelligence presents for reforming public-sector HRM, the challenges likely to constrain its adoption, and the administrative implications for governance, accountability and public-service values within Nigeria's federal system.

This study therefore seeks to answer the following questions:

1. To what extent is artificial intelligence currently deployed or being piloted in Nigerian public-sector human resource functions?

2. What organisational, institutional and socio-technical factors enable or constrain the integration of artificial intelligence?
3. How can artificial intelligence reshape core human resource management practices (talent acquisition, learning and development, performance management, employee experience and strategic workforce planning) while upholding public-service values of equity, accountability and meritocracy?
4. What governance frameworks are required to mitigate algorithmic bias, data privacy risks and deskilling?

Answering these questions will contribute to knowledge of digital change in public administration and provide an opportunity to offer policy recommendations to the Federal Civil Service Commission, the Office of the Head of the Civil Service of the Federation, and state public service commissions.

This paper examines a sample of federal and selected state public organisations in Nigeria. It excludes private enterprises and local government councils. The remaining part of this paper is structured as follows. The next section reviews current literature. It then presents the theoretical framework, research methods, results, a discussion of the findings, administrative implications, recommendations, and a brief conclusion.

1.2 Literature Review

1.2.1 Conceptual Foundations

Human resource management has gone through several cycles of change. It began with personnel administration, administrative record-keeping, payroll administration, and legal compliance, then shifted to strategic human resource management in the 1980s, arguing that employees should be reconceptualised as a source of sustained competitive advantage rather

than costs to be minimised (Bondarouk & Brewster, 2016). Most recently, a new paradigm called 'people analytics' has emerged in the last ten years: a systematic approach to leveraging data, statistical models and artificial intelligence to inform decisions across the employee life cycle (Strohmeier & Piazza, 2015; Zhai et al., 2024).

The AI application areas in HRM are a group of overlapping clusters of different families of tools and techniques: machine learning, both supervised and unsupervised, for attrition predication models, skills-gap diagnostics and auto-ranking applications; generative AI, for job descriptions, individually-tailored growth learning content and conversational search; computer vision for biometric attendance and id verification already in use in most public sector payrolling systems; NLP for résumé screening, employee polls sentiment analysis and chatbot autoreply; Robot Process Automation for high-volume, repetitive transaction processing tasks like leave administration and benefits management (Madanchian et al., 2023; de Gennaro, 2026).

These areas align directly with core HR functions. In recruitment and selection, these machine-learning algorithms can sort and screen large pools of applicants, speeding the hiring process and, if handled carefully, addressing specific aspects of discretionary bias. Learning and development systems can tailor and adapt learning paths to individual competence profiles. Performance management can shift from periodic evaluations to continuous, real-time feedback. Compensation analysis will uncover internal systemic failures; succession planning will help plan for future leadership; and employee engagement sensing will tap into survey text, social interaction information, and other indicators dynamically to guard against disengagement or burnout (Priksht et al., 2023; Ncube et al., 2025). Perhaps most interesting, these innovations will free specialists from transactional processes so they can focus their professional effort on diagnostics, consulting, and strategic advice.

Technical competence alone, though, does not assure organisational gains. Algorithmic systems can inherit biases from historical data, threaten to erode managerial autonomy, and raise ongoing concerns about transparency and accountability when they make sensitive employment decisions (Zhai et al., 2024; Tangi et al., 2025). These dilemmas are more glaring in the public sector, where decisions affect organisational functioning as well as the principles of public good, merit, social equity, and democratic accountability.

1.2.2 Global Evidence on AI in Public-Sector HRM

Additional comparative experience from other OECD administrations, Singapore, Estonia and selected African countries clearly shows both massive scope and several glasses to run. Singapore's Smart Nation has invested in using artificial intelligence to calibrate workforce planning and labor market forecasting. By comparison, Estonian digital-government operations automate several functions (such as establishing eligibility) that would otherwise require human resources, freeing staff to focus on more complex cases. In the United States and the European Union, agencies have found evidence that machine-learning tools save human time when assessing résumés, analysing the labour market, and making more consistent decisions (U.S. General Services Administration, 2025), speeding up high-volume transactions; analysing the entire workforce in granular detail and discovering patterns that would otherwise go unnoticed (Chilunjika et al., 2022; de Gennaro, 2026); targeted intervention; and artificial intelligence with human breaks have also been shown to reduce some kinds of third-party bias.

The risks also exist. Racial bias in algorithms can reflect history; opaque models can hamper the reasoned justification of decisions; and scoring-intensiveness can hamper 'deskilling' of practitioners and weaken judgment in critical public service appointments. Ongoing monitoring can portend new invasions of privacy without guaranteed safeguards (Wirtz et al., 2019; Tangi et al., 2025). Good practice deployment frames AI as socio-technical change to be

holistically optimized for technology, culture, skills, and responsibility (Tangi et al., 2025). African narratives echo this paradox: South Africa has launched pilot AI-enabled appointments, not without concerns about displacement and data quality (Chilunjika et al., 2022); and Kenya-Rwanda pushes forward digital bases, but infrastructure, 'skilled' AI-human personnel, and operational laws are still catching up (Owor et al., 2025). Readiness varies across the continent.

The probable institutional context for the AI ecosystem in Nigeria is indicated by the trajectory of the country's trajectory of its ongoing process of digital transformation. Artificial intelligence is notionally situated in an expanding policy space as a channel to reform the public sector and enhance skill development under the auspices of the National Digital Economy Policy and Strategy (2020–2030) and the National Artificial Intelligence Strategy (2025), Federal Ministry of Communications, Innovation and Digital Economy (2025). Data infrastructure has been put in place through the Integrated Personnel and Payroll Information System as well as biometric enrolment exercises and early efforts to operationalize artificial intelligence through state initiatives such as Ondo State's AI-enabled payroll platform. A series of capacity-building initiatives, such as UNESCO training for senior civil servants in AI, 1as well as the 3 Million Technical Talent skill development program, indicate a growing institutional policy focus on artificial-intelligence literacy.

1.2.3 Nigerian and African Contextual Literature

Despite these signals, empirical research on artificial intelligence in Nigerian public-sector human resource management remains sparse. Studies document persistent challenges of politicisation of appointments, weak performance culture, skills mismatches, brain drain and capacity deficits, alongside infrastructural and literacy barriers to digital adoption. The few available AI-specific studies indicate nascent and uneven uptake, with private-sector

organisations ahead of public institutions (Nwambuko, 2025; Ademeso et al., 2025). Continent-wide reviews confirm that infrastructure gaps, limited artificial-intelligence literacy and weak regulatory frameworks constrain scale (Owor et al., 2025).

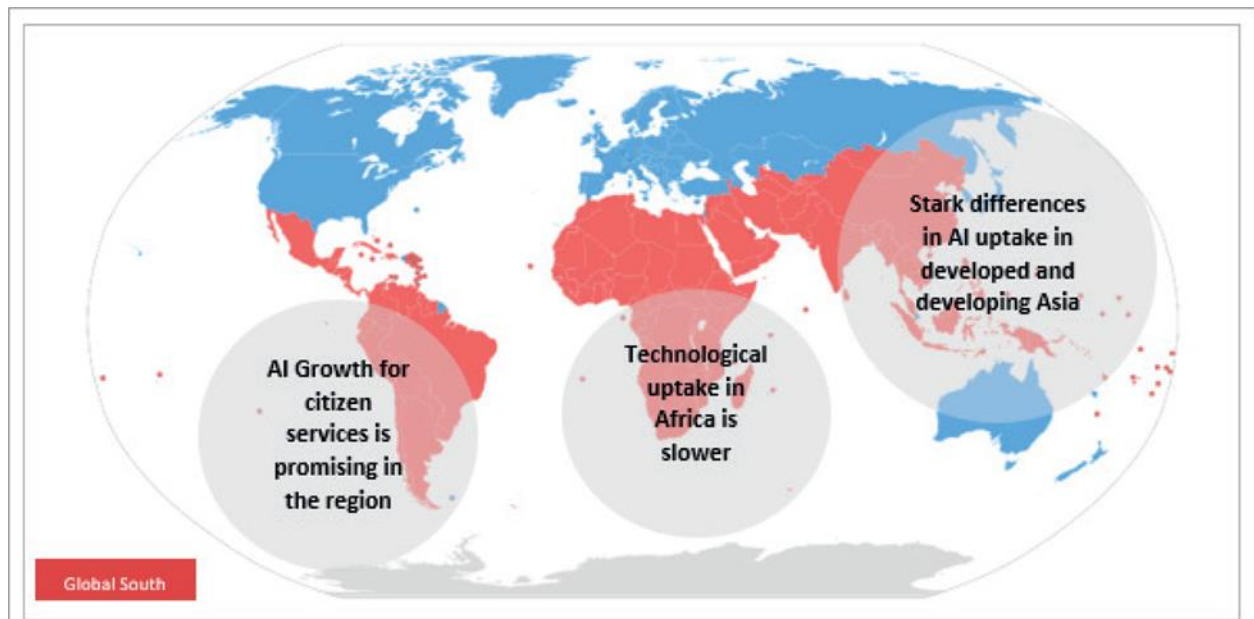


Figure 1. Map illustrating technological uptake across the Global South, highlighting the comparatively lower levels of digital infrastructure and technology adoption in most African countries relative to other developing regions.

1.2.4 Critical Synthesis and Research Gap

Two theoretical tensions frame the current body of literature. The first tension is between technological determinism and institutional path dependence. Several optimistic accounts portray artificial intelligence as an almost self-rolling technology bound to generate efficiency and objectivity. In contrast, many critical accounts highlight that African public bureaucracies are shaped by sticky formal and informal institutions, patrimonial networks, and resource endowments that influence how the technology plays out. The second tension is around the

relationship between efficiency gains and public-values considerations. Public-value theory argues that technology-induced administrative reforms must increase not only operational capacity but also legitimacy and equity; at the same time, socio-technical systems theory advocates jointly optimizing technical and social subsystems (Tangi et al., 2025).

Taken together, the literature shows that artificial intelligence can be used in public-sector human resources management. However, this is possible only at the organizational level, provided factors such as infrastructure and organizational readiness, data quality, leadership buy-in, effective regulations, and an articulated, explicit governance framework for ethics are in place. Evidence from around the world shows that high-capacity administrations use artificial-intelligence-enabled human resource management. Nigerian papers have not explored the nexus between algorithmic systems and the federal character principle, or the experiences of human resource and ICT officials, and similar governance designs that guarantee meritocracy and inclusion.

This article helps fill that gap by combining socio-technical systems theory with the technology-organization-environment framework and public-value concerns, and by producing new empirical findings from a federation and several state ministries, departments, and agencies. In doing so, it advances digital public administration research in a Global South bureaucratic context with formal ethnic and regional balancing procedures, a well-established phenomenon largely missing from current artificial-intelligence-in-human-resource-management models articulated by the Global North.

1.2.5 Policy Context and Research Gap

In Nigeria, both the National Digital Economy Policy and Strategy (2020–2030) and the National Artificial Intelligence Strategy (2025) position AI as a driver of public-sector

modernization and rely on the Integrated Personnel and Payroll Information System as the primary data source. However, empirical evidence on AI in Nigerian public-sector HRM remains limited. Publications describe few applications, little on the federal character principle, few on organizational, political, and technological barriers, and none on governance requirements. Understanding the efficiency and equity implications of AI planning is therefore urgently needed in sensitive and vulnerable contexts, while single-instrument perspectives are insufficient. Integrating socio-technical systems theory with public-value theory is necessary to deliver efficiency in service delivery without compromising equity and the public-service ethos.

1.3 Theoretical and Conceptual Framework

This study is anchored primarily in socio-technical systems (STS) theory, which posits that organisational performance arises from the joint optimisation of social subsystems (people, culture, power relations and work practices) and technical subsystems (algorithms, data infrastructures and digital platforms) rather than from technological excellence alone (Trist & Bamforth, 1951; Tangi et al., 2025). Complementary lenses sharpen the analysis. The technology–organisation–environment (TOE) framework identifies the technological, organisational and environmental determinants that shape AI adoption decisions in public bureaucracies (DePietro et al., 1990; de Gennaro, 2026). Public value theory insists that any technological intervention must simultaneously enhance operational capacity, secure legitimacy and advance equity (Moore, 1995). Institutional theory highlights isomorphic pressures and resistance in Global South bureaucracies, while scholarship on algorithmic accountability calls for bias mitigation, transparency, contestability, and human oversight in high-stakes public employment decisions (van den Broek et al., 2026).

These angles converge into the conceptual model shown in Figure 2. Technological readiness, data quality, leadership buy-in, and the regulatory environment constitute the independent variables (antecedents) that shape the pathways of AI integration into the core functions of human resource management (recruitment, learning and development, performance management, workforce planning, and employee experience); these integration pathways function as mediating variables. They in turn produce four dependent variables, namely efficiency, equity, employee experience, and public service delivery performance, moderated by the relationship between ethical governance and organizational capacity for change management. Figure 2 depicts AI-enabled human resource management as a contingent socio-technical phenomenon, ultimately dependent on algorithmic agents' obedience to the institutional values of the Nigerian public service, the principle of federal character, and the normative human resource governance framework.

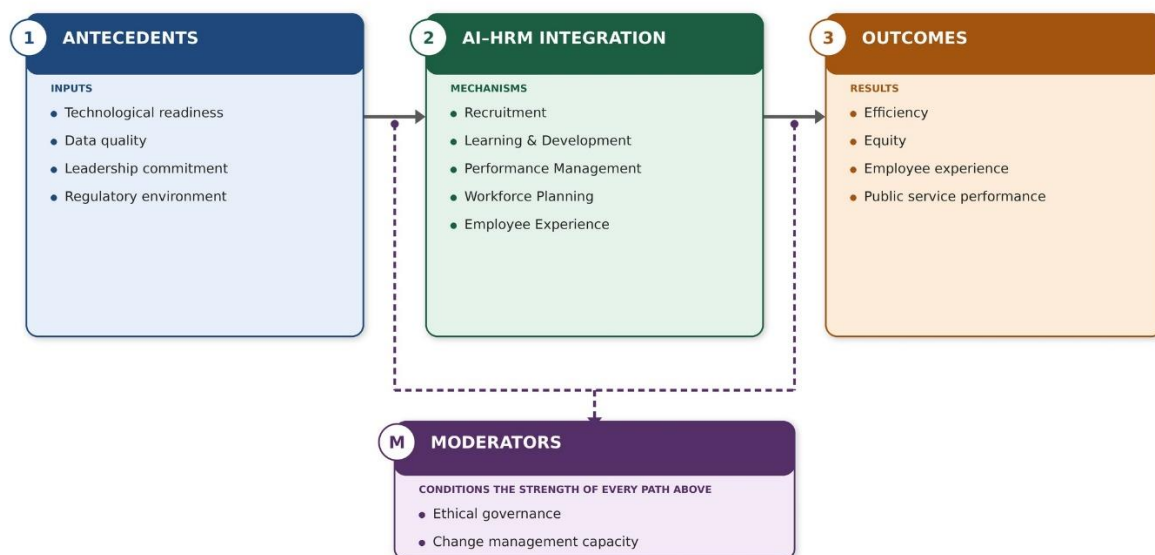


Figure 2: Conceptual Model of AI Integration in Nigerian Public-Sector Human Resource Management

1.4. Methodology

This study employed a concurrent mixed-methods approach with a qualitative-focused paradigm. Qualitative data were obtained from semi-structured interviews and focus group discussions with HR directors, permanent secretaries, ICT officers, and unionists from purposively selected federal and state MDAs (N = 18). Quantitative data were collected through a structured survey of mid- and top-level public officials, using contextualized UTAUT and TAM variables to assess AI acceptance. The study used purposive, stratified, and snowball sampling, along with document analysis. Ethical protocols ensured informed consent, voluntary participation, anonymization, and cultural sensitivity. Qualitative data underwent reflexive thematic analysis, while quantitative data were analyzed using descriptive and inferential statistics. Congruence between qualitative and quantitative findings, along with member-checking, enhanced study credibility. The independent, mediating, dependent and moderating variables set out in the conceptual framework (Section 4) are therefore used analytically, to structure data collection and interpretation, rather than tested statistically; the small purposive sample (N = 18 MDAs) supports descriptive and thematic analysis of how these variables relate in practice, but not correlation, regression or other inferential tests of the strength of association between them. Potential limitations included difficulty accessing hierarchical bureaucracies, a mismatch in timescale between AI developments and existing organizational structures, and the ongoing need for researcher reflexivity.

1.5. Findings / Results

The empirical evidence reveals a low-to-moderate level of AI/HR technology maturity across the sampled organisations. Most agencies remain at the early stages of digitalisation, relying mainly on IPPIS and biometric systems, with only limited pilots of automated screening or predictive tools (Table 1).

Table 1: *AI/HR Technology Maturity Levels across Sampled Organisations (N = 18)*

Maturity Level	Number of MDAs	Percentage	Typical Features Present
Nascent	9	50.0%	IPPIS + biometric enrolment only
Experimentation	7	38.9%	Limited pilots (résumé screening, basic chatbots)
Operational	2	11.1%	Predictive analytics + employee self-service
Total	18	100%	

Key enablers include existing biometric and IPPIS infrastructure, policy signals from the National Artificial Intelligence Strategy, pockets of visionary leadership, and Nigeria's youth demographic dividend (Table 2).

Table 2: *Key Enablers of AI Integration in Public-Sector HRM*

Enabler	Frequency of Mention	Relative Emphasis
Existing biometric and IPPIS infrastructure	16	High
Policy signals (National AI Strategy)	14	High
Visionary leadership pockets	11	Medium–High
Youth demographic dividend	9	Medium

These enablers are constrained by significant barriers: legacy systems and data silos, skills gaps among HR professionals, job-security fears, weak data governance, limited budgets for AI capability building, and federal character requirements that complicate algorithmic neutrality (Table 3).

Table 3

Key Barriers to AI Integration in Public-Sector HRM

Barrier	Frequency of Mention	Relative Emphasis
Legacy systems and data silos	17	Very High
Skills gaps among HR professionals	15	High
Resistance rooted in job-security fears	14	High
Weak data governance	13	High
Limited budgetary allocation for AI capability	12	Medium–High
Federal character / quota considerations	11	Medium–High

Stakeholders ranked talent acquisition transparency as the highest-priority impact domain, followed by performance analytics, workforce planning accuracy and learning personalisation (Table 4). Ethical concerns were widespread, particularly fears of geopolitical and educational bias, data privacy risks and potential undermining of the federal character principle (Table 5).

Table 4: Stakeholder Ranking of Perceived Impact Domains (Mean Rank; 1 = Highest Priority)

Impact Domain	Mean Rank	Standard Deviation
Talent acquisition transparency	1.8	0.9
Performance analytics	2.3	1.1
Workforce planning accuracy	2.7	1.0
Learning personalisation	3.2	1.2

Source: Author's field survey, 2026; stakeholder rankings of perceived impact domains (1 = highest priority).

Table 5: Ethical and Equity Concerns Raised by Respondents

Concern	Percentage of Respondents
Bias against certain geopolitical zones	68%
Bias linked to educational background	54%
Privacy of civil-servant data	71%
Risk of continuous surveillance	49%
Undermining of federal character principle	62%

Source: Author's field survey, 2026; percentage of respondents raising each ethical or equity concern.

Overall, the findings depict cautious experimentation constrained by institutional path dependence, skills deficits and unresolved tensions between efficiency goals and public-service values of equity and representation.

1.6. Discussion

These results are largely consistent with the conceptual model, read descriptively rather than as a statistically tested relationship: weak antecedents in technological readiness, data quality, leadership commitment, and normative context co-occur with few AI-HRM integration mechanisms and modest reported outcomes for efficiency, equity, and experience, without the data establishing the strength or direction of that association. Ethical governance and change-management capacity act as critical moderators; even promising pilots cannot scale or gain acceptance without them. These findings follow from previous socio-technical, level-1 research showing that technical achievability alone cannot break institutional path dependence (Tangi et al., 2025; de Gennaro, 2026). Artificial intelligence thus enables concerted gains in meritocratic transparency while also creating new digital divides. If algorithms are programmed on past patterns, they may systematically disadvantage applicants from certain geographies or educational sub-groupings; this is a form of digital exclusion, while over-dependence on automation risks endangering the administrative discretion and human judgment that may constitute its complementary ethos. The efficiency–equity dilemma is thus especially sharp in a constitutional design that institutionalizes federal character principles as a purposeful ideological counterweight to meritocratic delusions.

Institutional preparedness in the Nigerian public sector appears to lag behind private-sector Nigerian companies and other high-performing African public administrations such as Rwanda, Kenya, and South Africa. The findings thus recommend elaborating the TOE model and socio-technical systems theory at the micro-level, in the context of multi-level, federal

Nigerian bureaucracies. Empirical models inadequately specify the importance of formal ethnic, regional, and class compromises, as well as the implications for constitutionally defined representational quotas, on the jointly optimal performance of the social and technical subsystems. Integrating these institutional idiosyncrasies allows for more value-relevant predictions of AI adoption in Nigerian public administrative contexts.

1.7. Administrative Implications

This research adds to digital government and AI-in-HRM scholarship by taking a premise with eastern origins and not only extending it to a Global South public administration context with formal ethnic and regional balancing devices, but also capturing the specific nature of the context to broaden algorithmic fairness discussions, highlighting that fairness cannot simply be reduced to individual merit if constitutional principles such as federal character are used to achieve representational parity and should inform the theorization of AI framing and design.

Policy and practice implications are equally evident. Nigeria needs a National Framework for Responsible AI in Public HRM to institutionalize algorithmic impact assessments, human-in-the-loop requirements for high-stakes employment decisions, and independent audit capacity. Ongoing capacity-building infrastructure is also necessary in the form of AI literacy curricula embedded into the existing Administrative Staff College of Nigeria and the Public Service Institute. Concurrent investments in data infrastructure and interoperability standards are critical if public sector information assets in siloed systems are to produce dependable analytics. Change-management approaches need to make union concerns and public servants' psychological contracts explicit to address resistance driven by job-security fears.

A phased rollout strategy is recommended for HR directors and permanent secretaries deploying AI in public-service organizations: start by integrating generative AI into trial-and-

error work, then move to predictive analytics, and finally adopt generative AI in knowledge work. Public-service success metrics must be redefined to include measures of equity, employee trust scores, and service delivery so that automation focused on efficiency does not undermine value alignment.

1.8. Recommendations

In the near term (1-2 years), public-sector agencies should conduct limited trials of AI-aided recruitment screening instruments with corresponding mandatory bias audits. Test algorithmic outputs against federal character and equity benchmarks before scaling up, and use them to inform future benchmarks. Cross-MDA AI-HR communities of practice should be designed to avoid fragmented experimentation by sharing learnings, harmonizing evaluation metrics, and ensuring scalable projects. Current systems such as IPPIS should be upgraded for large-scale analytics so future AI projects can use validated workforce data with integrated data architectures.

Medium-term (3-5 years) programming to embed AI literacy through public service induction training and promotion exams to develop a broad base of staff who can understand and interrogate algorithms, as opposed to unquestioningly relying on them. Alongside this, establish legislation or formal standards on algorithmic accountability in public employment decisions, covering human oversight, contestability, and redress.

In the long term, Nigeria's public service should position itself as a continental reference point for ethical AI-enabled HRM, pursuing knowledge partnerships with African Union digital initiatives and selected peer countries to shape shared standards and mutual learning.

1.9. Conclusion

This research demonstrates that the opportunities artificial intelligence presents for Nigeria's public-sector HRM are real, but so are the challenges and administrative implications that determine whether that promise is realised. It makes an important contribution to HRM literature by showing that open AI applications are only one side of the equation; the technology is key, but the institutional environment in which it is embedded will be just as important in determining overall impact. This is a key message for HRM scholarship, policymakers, and practitioners designing future AI systems: no matter how advanced the algorithm, without parallel institutional redressal and human capacity improvements, the dichotomy of better services and unfair, inefficient public administration is unlikely to be addressed. What is needed in the future, therefore, is longitudinal research that traces the implementation path of AI in diverse institutional contexts, moving beyond cross-sectional framing of what is feasible.

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