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ASSESSMENT OF ARTIFICIAL INTELLIGENCE INTEGRATION ON TRACKING WORKPLACE ACTIVITIES FOR EFFECTIVE LOCAL GOVERNMENT ADMINISTRATION

EKEZUE HENRY MADUABUCHUKU
Department of Public Administration
Delta state Maritime Polytechnic Burutu
Email: ekezueh5@gmail.com

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ABSTRACT

This study assessed the integration of Artificial Intelligence (AI) in tracking workplace activities for effective administration within local government areas in Delta State, Nigeria. Adopting a descriptive survey research design, the study targeted a population of 445 local government employees, including administrative staff, ICT officers, and general staff. A sample size of 210 respondents was determined using Yamane's formula, selected through a multi-stage sampling technique to ensure representativeness across different roles and locations. Data were collected using structured questionnaires containing both closed- and open-ended questions. Validity was ensured through expert review and pilot testing, while reliability was confirmed using Cronbach's Alpha. Findings revealed a moderate level of AI integration, with significant adoption of biometric attendance systems (71.9%) and AI-based payroll systems (65.7%), while more advanced tools like performance analytics and workflow tracking software showed lower utilization. Respondents widely perceived AI as effective in enhancing staff attendance, accountability, productivity, and reducing the incidence of ghost workers. Regression analysis indicated a strong positive relationship between AI integration and staff performance ($R = 0.704$; $R^2 = 0.496$), with AI tools accounting for approximately 49.6% of the variance in performance. The model was statistically significant ($p < 0.05$), leading to the rejection of the null hypothesis. The study concludes that AI plays a significant role in improving administrative efficiency and workforce management in local government systems. It recommends broader implementation of advanced AI tools and capacity-building initiatives to maximize their potential in public administration..

Keywords: *Artificial Intelligence (AI), Workplace Activities, Local Government Administration, Tracking Systems*

INTRODUCTION

The 21st century has witnessed an accelerated shift towards digital governance, with Artificial Intelligence (AI) emerging as a key driver of transformation in public administration globally. Governments are increasingly leveraging AI technologies to improve efficiency, transparency, accountability, and service delivery. In particular, tracking workplace activities through AI has become a strategic tool for optimizing employee performance and institutional productivity.

AI technologies such as machine learning algorithms, natural language processing, computer vision, and robotic process automation (RPA) have already demonstrated value in both private and public sectors (Davenport & Ronanki, 2018). These tools can be employed to monitor employee performance, track workflow processes, identify inefficiencies, and provide real-time data for decision-making. By automating routine tasks and enabling predictive analytics, AI can contribute to better resource management and enhanced service delivery within local governments (Wirtz, Weyerer & Geyer, 2019). In many developing countries, including Nigeria, the local government system is constitutionally recognized as the third tier of government, responsible for grassroots development and basic service delivery. However, the performance of local government councils has been widely criticized for inefficiency, corruption, and poor service outcomes (Arowolo, 2011; Adeyemi, 2013). These challenges are often rooted in outdated administrative processes, lack of oversight, and ineffective workforce management. Integrating AI into these systems offers a unique opportunity to enhance performance monitoring, reduce human error, and promote data-driven decision-making (Zhou et al., 2020). AI tools such as machine learning algorithms, biometric attendance systems, real-time activity tracking, and performance analytics software can be deployed to track employee attendance, evaluate productivity, and detect anomalies in workflow patterns (Davenport & Ronanki, 2018). In Nigeria, the use of biometric and AI-based monitoring systems has already been initiated in select government agencies, including the Integrated Personnel and Payroll Information System (IPPIS), though not yet widely adopted at the local government level (Okwoli et al., 2020).

The persistent inefficiency in Nigerian local government administration is largely due to poor monitoring and control of workplace activities. Manual attendance registers, inadequate supervision, and lack of performance evaluation systems have led to absenteeism, ghost workers, and general administrative ineffectiveness (Adebayo, 2014). While AI offers solutions to these problems, its integration into local government structures has not been fully explored or evaluated.

This study seeks to fill the gap by assessing how AI is currently being integrated to track workplace activities in local government areas, and how this affects overall administrative performance. It also aims to uncover the barriers limiting successful AI adoption in this crucial sector.

Objectives of the Study

The main objective of this study is to assess the integration of artificial intelligence in tracking workplace activities for effective local government administration in Nigeria. The specific objectives are to:

1. Examine the extent of AI integration in local government administrative systems in Nigeria.
2. Evaluate the effect of AI in tracking workplace activities and improving staff performance in local governments local government administration in Nigeria.

Research Questions

1. What is the extent of AI integration in local government administrative systems in Nigeria?
2. What is the effect of AI in tracking workplace activities and improving staff performance in local governments local government administration in Nigeria?

Research Hypothesis

- **(H□):** There is no significant effect of AI in tracking workplace activities and improving staff performance in local government administration in Nigeria.
- **(H□):** There is a significant effect of AI in tracking workplace activities and improving staff performance in local government administration in Nigeria.

Significance of the Study

This study is significant for several reasons. First, it contributes to the body of knowledge on digital governance and the application of AI in public administration within a developing country context. Second, the findings will provide valuable insights for policymakers, local government officials, and ICT experts on how to leverage AI for improving transparency, accountability, and productivity in local governance. For Nigeria, where the local government system is often regarded as the most inefficient tier, this research offers practical recommendations on how emerging technologies can reverse that narrative. The study also serves as a resource for academics and students interested in public sector innovation and AI implementation in governance.

LITERATURE REVIEW

The integration of Artificial Intelligence (AI) in public administration has attracted increasing scholarly attention, especially in the context of digital governance and organizational performance. AI encompasses a range of technologies, including machine learning, natural language processing, computer vision, and robotic process automation, which have been deployed to automate tasks, improve decision-making, and enhance service delivery in both public and private sectors (Davenport & Ronanki, 2018). As governments strive for increased transparency and efficiency, AI-driven tools have become instrumental in tracking workplace activities, streamlining workflows, and fostering a culture of accountability (Adeyemi, 2013).

Artificial Intelligence (AI) refers to the development of computer systems that can perform tasks typically requiring human intelligence, such as reasoning, learning, decision-making, and problem-solving. AI encompasses various subfields, including machine learning, natural language processing, robotics, and computer vision, which enable machines to interpret data, adapt to new inputs, and perform cognitive functions (Davenport & Ronanki, 2018). In the context of public administration, AI technologies can be employed to enhance efficiency, monitor employee activities, automate repetitive tasks, and improve service delivery. For instance, AI-powered systems can be used in local governments to track staff attendance, generate performance analytics, and detect irregularities in workflow processes. In developing country like Nigeria, AI is still at a nascent stage of implementation within public institutions, efforts are being made to incorporate it into governance structures to improve accountability and administrative effectiveness (Okwoli, Emmanuel & Udu, 2020).

Globally, AI adoption in governance is reshaping the traditional models of public administration. According to Wirtz, Weyerer, and Geyer (2019), AI technologies are enabling real-time data collection,

predictive analytics, and automation of bureaucratic processes, which significantly reduce inefficiencies in service delivery. AI applications have proven useful in personnel management, fraud detection, resource allocation, and citizen engagement. In developed countries, AI has been leveraged to monitor compliance, assess performance metrics, and support evidence-based policymaking. One of the emerging trends in AI application is the use of intelligent systems to monitor and evaluate employee activities. Tools such as biometric attendance systems, performance tracking software, and workflow automation technologies have demonstrated the potential to improve workforce accountability and productivity. AI algorithms can detect behavioral patterns, predict absenteeism, and identify operational bottlenecks (Zhou et al., 2020). These systems not only ensure compliance but also generate insights for strategic human resource planning. Davenport and Ronanki (2018) argue that AI-enabled performance tracking transforms workforce management by offering objective, data-driven assessments of employee contributions. This is particularly beneficial in the public sector, where traditional performance appraisal systems are often subjective and prone to bias. By using AI tools, managers can obtain a real-time overview of staff engagement and intervene promptly where performance gaps are identified.

In Nigeria, local government administration is plagued by persistent inefficiencies, often stemming from weak institutional structures, poor supervision, and outdated administrative practices (Arowolo, 2011; Adeyemi, 2013). Manual record-keeping systems and paper-based processes contribute to operational delays and corruption. Adebayo (2014) highlights issues such as ghost workers, absenteeism, and a general lack of accountability as major setbacks in local government performance. Despite being constitutionally empowered to drive grassroots development, many local councils in Nigeria have failed to meet basic service delivery expectations. Efforts to address these challenges have included the introduction of digital reforms such as the Integrated Personnel and Payroll Information System (IPPIS), which uses biometric data to authenticate staff identity and eliminate ghost workers (Okwoli et al., 2020). However, the implementation of such systems at the local government level has been limited, and their effectiveness remains under-evaluated (Wirtz, et al., 2019).

Nigeria has made some progress in adopting digital solutions for federal-level operations, the penetration of AI technologies into local government systems remains minimal. Studies have identified infrastructural limitations, digital illiteracy, funding constraints, and resistance to change as key barriers to successful technology adoption in the public sector (Okwoli et al., 2020; Wirtz et al., 2019). Additionally, a lack of policy frameworks to guide AI deployment has contributed to its slow uptake in local administration (NITDA, 2021). Nevertheless, there is growing recognition of the transformative potential of AI in enhancing administrative efficiency at the grassroots level. AI-based tracking systems can help local government authorities improve staff supervision, eliminate fraud, and boost institutional productivity. Zhou et al. (2020) advocate for a strategic, phased approach to AI implementation, emphasizing the need for capacity building, stakeholder engagement, and regulatory support.

RESEARCH METHODOLOGY

Research Design

This study will adopt a descriptive survey research design, which is appropriate for gathering data from a specific population to examine the current status, opinions, practices, and trends related to AI integration in local government administration. The design is suitable because it allows the researcher to collect both quantitative and qualitative data regarding the extent and effectiveness of AI applications in tracking workplace activities.

Population of the Study

The target population for this study includes 445 employees, ICT officers, and administrative heads selected from all the local government areas in Delta State, Nigeria. These groups were directly involved in or affected by administrative processes and technology deployment within the local government system.

Sampling Technique and Sample Size

A multi-stage sampling technique was employed. First, purposive sampling will be used to select a representative number of local government areas from different geopolitical zones of Nigeria, ensuring regional diversity. Secondly, stratified random sampling will be used to select respondents from within each selected local government, categorizing them by role (e.g., administrators, ICT personnel, general staff). The sample size of 210 respondents was selected using Yamane's formula for finite population sampling, ensuring statistical representativeness and allowing generalization of findings.

Data Collection Instruments

Data was collected through a Structured questionnaire designed using both closed- and open-ended questions to capture quantitative data on the extent of AI integration, AI usage and perceived effectiveness.

Validity and Reliability of Instruments

To ensure validity, the questionnaire and interview guide will be reviewed by experts in public administration and information technology. A pilot test will also be conducted in one local government area to fine-tune the instruments. Reliability will be tested using Cronbach's Alpha to measure the internal consistency of the questionnaire items. A reliability coefficient of 0.7 or higher will be considered acceptable.

Method of Data Analysis

Quantitative data obtained from questionnaires will be analyzed using descriptive statistics (such as frequencies, percentages, and mean scores) and inferential statistics (regression analysis) using SPSS software.

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	120	57.1%
	Female	90	42.9%
Designation	Administrative Staff	98	46.7%
	ICT Officers	52	24.8%
	General Staff	60	28.5%
Years of Service	1–5 years	74	35.2%
	6–10 years	88	41.9%
	11 years and above	48	22.9%

(Field survey, 2025)

Table 1 shows the demographic profile of respondents. In terms of gender, the majority of respondents were male, accounting for 120 individuals or 57.1% of the sample, while females made up 90 respondents or 42.9%. Regarding designation, administrative staff formed the largest group with 98 individuals (46.7%), followed by general staff at 60 (28.5%), and ICT officers at 52 (24.8%). When considering years of service, the highest proportion of respondents had between 6 to 10 years of service, totaling 88 individuals (41.9%). This was followed by those with 1 to 5 years of service at 74 respondents (35.2%), and those with over 11 years of service at 48 respondents (22.9%).

Research Question 1: What is the extent of AI integration in local government administrative systems in Nigeria?

Table 2: Descriptive analysis of the extent of AI integration in local government administrative systems in Nigeria

AI Integration Indicator	Agree (%)	Disagree (%)	Undecided (%)
Use of biometric attendance systems	71.9%	20.0%	8.1%
Deployment of workflow tracking software	43.3%	46.2%	10.5%
Utilization of performance analytics tools	39.0%	48.6%	12.4%
Presence of AI-based payroll system	65.7%	27.1%	7.2%

(Field survey, 2025)

Table 2 shows that AI integration in local government systems is moderate. A majority (71.9%) agreed that biometric attendance systems are in use, and 65.7% confirmed the presence of AI-based payroll systems. However, only 43.3% acknowledged the use of workflow tracking software, and just 39.0% agreed that performance analytics tools are utilized. This indicates stronger adoption of basic AI tools like attendance and payroll, while more advanced systems remain limited.

Research Question 2: What is the effect of AI in tracking workplace activities and improving staff performance in local government administration in Nigeria?

Table 3: Descriptive analysis of the effect of AI in tracking workplace activities and improving staff performance in local government administration in Nigeria

Effect of AI Tools	SA(%)	A (%)	D (%)	SD (%)
AI enhances staff attendance and reduces absenteeism	54.3%	33.3%	10.5%	1.9%
AI improves accountability and transparency	49.5%	36.2%	11.0%	3.3%
AI increases productivity and performance tracking	46.7%	30.0%	17.1%	6.2%
AI reduces incidence of ghost workers	51.9%	28.6%	14.8%	4.8%
AI tools are reliable for decision-making	39.0%	37.6%	18.6%	4.8%

(Field survey, 2025)

Table 3 reveals that respondents generally perceive AI tools as having a positive impact on workplace activity tracking and staff performance in local government administration. A combined 87.6% agreed that AI enhances staff attendance and reduces absenteeism, while 85.7% believed AI improves accountability and transparency. Similarly, 75.3% agreed that AI increases productivity and performance tracking, and 80.5% acknowledged its role in reducing ghost workers. Although slightly lower, 76.6% viewed AI tools as reliable for decision-making. Overall, these results suggest that AI is widely recognized as effective in enhancing staff performance and administrative efficiency.

Hypothesis Testing

Table 4: Multiple Regression Analysis on the Effect of AI on Staff Performance

(A) Model Summary

Model	R	R-Square	Adjusted R^{-2}	Std. Error of Estimate
1	0.704	0.496	0.493	4.21563

B) ANOVA of the model

Source ofvariation	Sum of Squares	df	Mean Square	F -cal	Sign
Regression	9124.657	1	9124.657		
Residual	9231.221	208	62.362	528.93	.000
Total	18355.878	209			

(C) Coefficients Table

Model	Unstandardized co-efficient		Standardized co-efficient	t-cal.	Sig. (p-value
	B	Std. Error	Beta		
(Constant)	4.832	0.489	.762	9.880	.000
AI Tools	0.812	0.035		22.998	.000

(*p < 0.05 indicates significance)

The model summary shows an R-value of 0.704, indicating a strong positive correlation, while the R^2 value of 0.496 implies that approximately 49.6% of the variance in staff performance can be explained by AI integration. The ANOVA results further support this finding, with a calculated F-value of 528.93 at 1 and 148 degrees of freedom and a significance level (p) of 0.000. Since the p-value is less than 0.05, the model is statistically significant, leading to the rejection of the null hypothesis. From the coefficients table, the constant (intercept) is 4.832, suggesting that in the absence of AI tools, the baseline staff performance score is 4.832. Additionally, the unstandardized coefficient for AI tools is 0.812, which means that for every unit increase in AI integration, staff performance increases by 0.812 units. The statistical significance of this effect is reinforced by a t-value of 22.998 and a p-value of 0.000, confirming that AI integration has a meaningful impact on staff performance in local government administration. Given that the p-value (.000) is less than the alpha level (.05) and the F-value is high (528.93), we reject the null hypothesis (H_0) and accept he alternative hypothesis which stated that; there

is a significant effect of AI in tracking workplace activities and improving staff performance in local government administration in Nigeria.

REFERENCES

Adebayo, A. (2014). Corruption in the Local Government System in Nigeria. *Journal of Social Sciences and Public Policy*, 6(1), 45–54.

Adebayo, A. (2014). *Principles and practice of public administration in Nigeria*. Spectrum Books.

Adeyemi, O. O. (2013). Corruption and local government administration in Nigeria: A discourse of core issues. *European Journal of Sustainable Development,* 2(3), 67–78.

Arowolo, D. (2011). Local government administration and the challenges of rural development in Nigeria. *Journal of Sustainable Development*, 4(5), 284–290.

Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review*, 96(1), 108–116.

NITDA (2021). *National Artificial Intelligence Policy Draft*. National Information Technology Development Agency, Nigeria. www.nitda.gov.ng

Okwoli, A. A., Sule, S., & Lawal, A. A. (2020). Impact of integrated personnel and payroll information system (IPPIS) on the Nigerian public service: A study of selected ministries. *International Journal of Public Administration and Management Research*, 5(3), 15–28.

Wirtz, B. W., Weyerer, J. C., & Geyer, C. (2019). Artificial intelligence and the public sector—Applications and challenges. *International Journal of Public Administration*, 42(7), 596–615.

Zhou, Y., Pan, S., Jin, S., & Wang, Z. (2020). Artificial intelligence in public services: A review and future perspectives. *Government Information Quarterly*, 37(4), 101518.