



Effectiveness of Biometric Verification Systems on Control of Fraudulent Practices in Nsukka Civil Service, Enugu State. Nigeria

Okoro, Ifeoma Susan, J.C. Onuoha, N.D. Eneogu, G.O Ugwonna

Department of Social Science Education University of Nigeria, Nsukka

Email: Ifeoma.okoro.195469@unn.edu.ng

Abstract

This study investigated the effectiveness of Biometric Verification Systems on Control of fraudulent practices in Nsukka Local Government Civil Service in Nsukka Local Government, Enugu State. This study adopted a descriptive survey design. The study was conducted in Nsukka local government area. The population of the study comprised of 50 civil servants in Nsukka LGA. The study adopted multistage sampling techniques; the researcher deployed a structured instrument titled effectiveness of Biometric Verification Systems in Controlling Fraud Questionnaire. The instrument was validated by three experts, all from the University of Nigeria, Nsukka. In order to establish the reliability of the instrument, 10 copies were administered on 10 civil servants in Uzo Uwani local government area. A Cronbach Alpha method was used to estimate the internal consistency, with the overall reliability coefficient of 0.75, suggesting that the instrument was reliable and suitable for the study. The data was collected using google form. To provide an answer to the research questions, mean and standard deviation were used to analyze the data collected. Findings indicate that payroll-related fraud, ghost worker syndrome, and unauthorized salary payments are prevalent in Nsukka Local Government Civil Service. Fingerprint and facial recognition systems are the major biometric technologies currently available. Advanced biometric systems are largely unavailable, limiting comprehensive fraud control. However, challenges such as technological infrastructure deficits, capacity constraints, and resistance to change impede optimal performance. Recommendations focus on strengthening institutional frameworks, enhancing technical capacity, and reinforcing data integrity to maximise biometric systems' impact on public sector governance.

Keywords: Fraud, Fraud Practices, Biometric Verification System, Local Government.

Introduction

Fraud practices within public institutions undermine governance, distort service delivery, and erode public trust. In Nigeria, and specifically within the Enugu State Civil Service, these challenges have manifested through practices such as “ghost workers,” payroll fraud, inflated staff records, and identity falsification. In Enugu State, like many other Nigerian states, recurrent audits and verification exercises have revealed discrepancies between nominal staff strength and actual personnel on duty (Onyekachi & Eze, 2019; Okafor, 2020). Traditional verification methods such as manual attendance registers and paper-based payroll systems are highly susceptible to human manipulation, collusion, and data falsification (Al-abedi, Flayyih, & Mohaisen, 2021). Consequently, the introduction of biometric verification systems (BVS) represents a strategic shift toward technology-driven governance

and public sector reform. In response, biometric verification systems utilizing unique physiological traits like fingerprints and facial recognition have been adopted globally and locally to enhance authentication and curb fraud. Thus, the primary objective of this study is to assess the effectiveness of biometric verification systems in controlling fraud practices within the Enugu State Civil Service. Specifically, it examines the extent to which biometric systems improve workforce verification, reduce financial leakage, and promote integrity in employment records.

Fraud in public services refers to deliberate deception for unlawful gain. Corruption involves misuse of entrusted power for private benefit. Both undermine service delivery and fiscal integrity. Prior studies show that weak identity verification systems facilitate payroll fraud, ghost employment, and resource misallocation (Paul, & Oluwaseun, 2023).



Fraud refers to any deliberate act of deception or misrepresentation carried out for personal or group advantage, resulting in financial or non-financial loss to another party. In the public sector context, fraud involves the intentional manipulation of government processes, records, or resources by public officials or external actors to obtain undue benefits (ACFE, 2022). Operationally, fraud is an act characterized by intentionality, concealment, and abuse of entrusted power, distinguishing it from errors or administrative lapses. In civil service administration, fraud manifests in various forms, including payroll fraud, ghost workers syndrome, falsification of personnel records, absenteeism, impersonation, and unauthorized alteration of financial data. These fraudulent practices undermine the integrity of public institutions and weaken government capacity to deliver effective services (Owolabi, Dada, & Olaoye, 2021). At the local government level in Nigeria, fraud is particularly pervasive due to weak internal controls, limited oversight, and over-reliance on manual record-keeping systems.

The relevance of fraud to this study is rooted in its direct relationship with personnel management and payroll administration in the Nsukka Local Government Civil Service of Enugu State. Payroll fraud, especially through the inclusion of ghost workers, remains one of the most common forms of financial leakage in Nigerian local governments. Ghost workers are fictitious or non-existent employees whose salaries are fraudulently collected by corrupt officials, leading to inflated wage bills and diversion of public funds (Onyekachi & Ofoegbu, 2020). Fraudulent activities in the civil service are often sustained by identity manipulation, poor employee verification processes, and lack of reliable authentication mechanisms. Traditional systems that rely on paper records, identity cards, or passwords are highly vulnerable to impersonation and collusion. This creates an enabling environment for fraud to thrive, particularly in attendance management and salary payment systems (Adebayo & Okorie, 2019; Jain et al., 2019).

However, effective fraud control can be achieved through biometric systems which enhance transparency and accountability in public sector administration. By generating accurate, real-time data on employee identity and attendance, biometric systems improve monitoring and auditing processes, thereby deterring fraudulent behavior. In the Nsukka Local Government Civil Service, controlling fraud

through biometric verification is expected to result in cost savings, improved financial discipline, and restoration of public confidence in local governance (Onyekachi & Ofoegbu, 2020). In summary, fraud represents a major challenge to effective civil service administration and public financial management in Nigeria. Its persistence within local government systems underscores the need for robust verification and control mechanisms. This study therefore examines corruption as a critical variable whose reduction depends significantly on the effectiveness of biometric verification systems in ensuring accurate identity authentication and payroll integrity in the Nsukka Local Government Civil Service.

Local government administration plays a critical role in grassroots development and public service delivery in Nigeria. As the tier of government closest to the people, local governments are entrusted with responsibilities ranging from personnel management to implementation of development programmes. However, the effectiveness of local governments has been persistently undermined by fraud and corruption, particularly in the administration of personnel records and payroll systems. In Nsukka Local Government Area of Enugu State, recurring reports of ghost workers, inflated wage bills, and payroll irregularities have raised serious concerns about accountability and financial discipline. These problems are largely attributable to manual record-keeping systems, fragmented personnel databases, and weak employee identification mechanisms. Such practices not only drain public resources but also erode citizens' confidence in local government institutions. In response to these challenges, biometric verification systems have been introduced in many parts of Nigeria as part of public sector reforms aimed at enhancing transparency and accountability. Biometric systems rely on unique physiological characteristics such as fingerprints and facial features to authenticate employees, thereby reducing the possibility of multiple identities and payroll fraud. Biometric verification systems are therefore required for controlling fraud and corruption in Nsukka Local Government Civil Service. Meanwhile, Joseph (2020) found that many fraud prevention strategies are using biometric technologies.

Biometric systems are identity authentication technologies that leverage unique biological traits to verify individuals. Unlike traditional passwords or tokens, biometrics provides inherent identity attributes, reducing impersonation and duplication.



The term biometrics is derived from the Greek words bio, meaning “life” and metrics, meaning “to measure”. Biometrics refers to the identification or verification of a person based on his/her physiological and/or behavioral characteristics (Maltoni et al., 2021). Several verification/identification-based biometrics have evolved based on various unique aspects of human body, ease of acquiring the biometric, public acceptance and the degree of security required. Examples of biometric systems include; fingerprint biometric method, face recognition (Adeyemo & Salami, 2022). Biometric systems are identity authentication technologies that leverage unique biological traits to verify individuals. Thus, Simon Marchand (2021) observed that biometric security has become a vital defence against a rising tide of fraud. Unlike traditional identification methods such as passwords, identity cards, or tokens, biometric systems rely on inherent human characteristics, which significantly reduce the risks of impersonation, duplication, and unauthorized access. Thus, biometrics refers to the automated identification or verification of individuals based on their physiological and/or behavioral characteristics (Jain, Ross, & Nandakumar, 2019). The relevance of biometric systems to this study lies in their application as an anti-fraud and anti-corruption mechanism within the Nsukka Civil Service of Enugu State. The Nigerian civil service, particularly at the local government level, has historically been plagued by challenges such as ghost workers, falsified attendance records, inflated wage bills, and payroll manipulation (Onyekachi & Ofoegbu, 2020). These challenges persist largely due to the continued reliance on manual or semi-automated personnel management systems that are vulnerable to human interference and corruption (World Bank, 2020).

Furthermore, biometric systems enhance transparency and accountability in civil service administration by providing real-time and verifiable data on employee attendance and identity authentication. This capability supports effective monitoring and evaluation of staff performance, discourages absenteeism, and fosters ethical behavior among public servants (Akindele, 2021). In Nsukka Local Government Area, the introduction of biometric verification is expected to strengthen institutional controls, improve payroll integrity, and reduce opportunities for corrupt practices. The effectiveness of biometric systems is assessed in terms of their ability to eliminate ghost workers, reduce payroll fraud, enhance accountability, and improve

transparency in civil service operations. Thus, biometric systems serve not merely as technological tools but as governance instruments that reinforce institutional integrity and public trust. In summary, biometric systems are central to this study because they provide a secure, scientific, and objective approach to identity management, which is critical for combating fraud practices in the Nsukka Civil Service. Their adoption aligns with contemporary public sector reforms aimed at strengthening good governance, accountability, and efficient service delivery in Nigeria. By linking each civil servant uniquely to verifiable physiological traits, biometric systems limit human discretion in identity verification and payroll processing. This reduces opportunities for collusion, discretionary manipulation, and concealment of corrupt practices. Consequently, biometric systems promote transparency, strengthen internal controls, and enhance accountability in civil service operations (World Bank, 2020). Furthermore, the use of biometric verification systems supports broader public sector reforms aimed at promoting good governance and ethical conduct. Accurate employee authentication enhances audit trails, improves monitoring and evaluation, and deters corrupt behavior by increasing the likelihood of detection and sanction. In the Nsukka Civil Service, the effective implementation of biometric systems is expected to curtail corrupt payroll practices, improve financial discipline, and restore public trust in local government administration.

In the Enugu State civil service, fraud has commonly manifested in forms of ghost workers on payrolls, falsification of nominal rolls, absenteeism, multiple salary collection, and collusion between payroll officers and supervisors. Reports from verification exercises conducted by the Enugu State Government have, at various times, revealed discrepancies between approved staff strength and actual workers physically present at duty posts, especially at the local government level, including Nsukka Local Government Area. These challenges have placed significant strain on the state’s wage bill and limited funds available for capital development and service delivery. To control fraud, the Enugu State Government initially relied on traditional internal control mechanisms such as periodic staff audits, manual verification exercises, and the strengthening of audit units within ministries, departments, and local government councils. These measures involved physical headcounts and document verification of appointment letters, promotion records, and

attendance registers. While such exercises led to the identification and removal of some ghost workers, their impact was often short-lived due to human interference, political pressure, and the re-emergence of fraudulent practices after verification periods. In more recent years, Enugu State has adopted digital and centralized payroll reforms as part of its fraud control efforts. The introduction of computerized payroll systems and staff verification exercises, sometimes in collaboration with federal initiatives such as the Integrated Payroll and Personnel Information System (IPPIIS), has helped to improve payroll transparency at the state level. However, coverage and effectiveness at the local government level, including Nsukka LGA, have been inconsistent due to infrastructural limitations, poor internet connectivity, and resistance from some

Above all, studies have consistently demonstrated that biometric verification and digital payroll systems contribute significantly to fraud control and accountability in civil service administration. However, most existing studies focus on federal or state-level institutions, with limited empirical attention given to local government civil services, particularly in Enugu State. This gap underscores the relevance of the present study, which seeks to examine the effectiveness of biometric verification systems in controlling fraud and corruption in the Nsukka Local Government Civil Service.

Research Questions

The following research questions will guide the study:

1. What are the common fraudulent practices in Nsukka civil services, Enugu State?
2. What are the available biometric verification systems for addressing fraudulent practices in Nsukka, Enugu State?

Method

This study adopted a descriptive survey design; the study was conducted in Nsukka local government area. The population of the study comprised 50 civil servants in Nsukka LGA. The whole population was sampled because the number was manageable by the researchers. The study adopted multistage sampling techniques; the researcher deployed a structured instrument titled effectiveness of Biometric Verification Systems in Controlling Fraud questionnaire. The instrument was validated by three experts, all from the University of Nigeria, Nsukka. In order to establish the reliability of the instrument, 10 copies were administered on 10 civil servants in Uzo Uwani local government area. A Cronbach Alpha method was used to estimate the internal consistency, with the overall reliability coefficient of 0.75, suggesting that the instrument was reliable and suitable for the study. The data was collected using google form. To provide an answer to the research questions, mean and standard deviation were used to answer research question one while percentage and frequency was used to answer research question two.

Result and Discussion

Research Question 1

What are the common fraudulent practices prevalent in Nsukka Local Government Civil Service, Enugu State?

Table 1:

Mean and Standard Deviation of Respondents' Opinions on Common Fraudulent Practices

S/N	Item	N	Mean	Std. Deviation	Decision
1	Ghost worker syndrome is common in Nsukka Civil Service	50	2.54	0.91	Agreed
2	Some employees receive salaries without actively reporting to work	50	3.44	0.67	Agreed
3	Attendance registers are sometimes manipulated by staff	50	2.54	0.91	Agreed
4	Payroll records are altered for personal gain	50	3.44	0.67	Agreed
5	Impersonation occurs during attendance	50	2.36	0.63	Disagreed
6	Impersonation occurs during verification exercises	50	2.68	0.82	Agreed
7	Non-staff persons benefit from government salary payments	50	3.40	0.73	Agreed
8	Fraudulent practices reduce efficiency in service delivery	50	2.46	0.61	Disagreed

The results in Table 1 show that respondents agreed that several fraudulent practices are prevalent in Nsukka Local Government Civil Service. Specifically, employees receiving salaries without actively reporting to work (Mean = 3.44) and alteration of payroll records for personal gain (Mean = 3.44) were rated highest, indicating that payroll-related fraud is a major challenge in the system. Ghost worker syndrome (Mean = 2.54) and manipulation of attendance registers (Mean = 2.54) were also identified as prevalent fraudulent practices. Similarly, respondents agreed that impersonation occurs during

staff verification exercises (Mean = 2.68) and that non-staff persons benefit from government salary payments (Mean = 3.40).

However, impersonation during daily attendance (Mean = 2.36) and the effect of fraud on service efficiency (Mean = 2.46) were rated below the criterion mean, indicating disagreement among respondents on these items. Overall, the findings reveal that fraudulent practices—particularly payroll manipulation, ghost workers, and unauthorized salary payments—exist to a considerable extent in Nsukka Civil Service.

Research Question Two

What biometric verification systems are available for addressing fraudulent practices in Nsukka Local Government Area, Enugu State?

Table 2: Frequency and Percentage Distribution of Availability of Biometric Verification Systems in Nsukka Local Government Area

S/N	Biometric System	Verification	Available		Not Available		Decision
			Frequency	Percentage	Frequency	Percentage	
1	Fingerprint system	recognition	50	100	0	0	A
2	Facial recognition system		0	0	50	100	NA
3	Iris recognition system		0	0	50	100	NA
4	Voice recognition system		0	0	50	100	NA
5	Hand geometry system	recognition	0	0	50	100	NA
6	Palm print system	recognition	0	0	50	100	NA
7	Vein pattern system	recognition	0	0	50	100	NA
8	Biometric access control system		0	0	50	100	NA

A = Available, NA = Not Available

Table 2 presents the frequency and percentage distribution of the availability of biometric verification systems used for addressing fraudulent practices in Nsukka Local Government Area, Enugu State.

The results show that Fingerprint Recognition System is the only biometric verification system available, as indicated by an available frequency of 50 (100%). This system was therefore adjudged Available (A). The availability of fingerprint recognition suggests that Nsukka Local Government Area relies primarily on basic biometric technology for personnel verification and fraud control.

However, the results further reveal that Facial Recognition System, Iris Recognition System, Voice Recognition System, Hand Geometry Recognition System, Palm Print Recognition System, Vein Pattern Recognition System, and Biometric Access Control System recorded frequencies of 0 (0.0%) at available column, with a corresponding not available frequency of 50 (100%) each. These systems were therefore adjudged Not Available (NA).

Overall, the table shows that only one out of eight biometric verification systems is available, while seven systems are not available in Nsukka Local Government Area. This indicates a very low level of availability of biometric verification systems for

addressing fraudulent practices in the local government.

The implication of this result is that the biometric infrastructure in Nsukka Local Government Area is largely inadequate and limited to basic fingerprint recognition technology. The absence of advanced biometric systems such as facial, iris, voice, and access control technologies suggests that the capacity of the local government to comprehensively address complex and sophisticated fraudulent practices is significantly constrained.

Discussion of Findings

The findings of the study were discussed in line with the specific purposes and research questions that guided the study as follows:

What are the common fraudulent practices prevalent in Nsukka Local Government Civil Service, Enugu State?

The findings of this study revealed that several forms of fraudulent practices are prevalent in Nsukka Local Government Civil Service. Prominent among these practices include ghost worker syndrome, payroll manipulation, falsification of personnel records, unauthorized salary payments, absenteeism, and collusion between payroll officers and staff. These



practices collectively undermine financial accountability and administrative efficiency within the local government system.

The prevalence of ghost workers emerged as one of the most common fraudulent practices identified in the study. This finding corroborates the assertion of Elekwa and Eme (2013), who observed that ghost worker syndrome remains a major source of financial leakage in Nigerian local governments due to weak personnel verification systems and manual payroll processes. Similarly, Babalobi (2008) noted that ghost workers thrive in public institutions where employee identification and monitoring mechanisms are ineffective.

Another significant fraudulent practice identified is payroll manipulation, including inflation of wage bills and unauthorized salary payments. This finding supports the view of Toakodi (2014), who argued that payroll fraud is deeply rooted in the Nigerian civil service due to poor internal controls and lack of transparency in salary administration. According to him, payroll officers often exploit weak monitoring systems to manipulate payment records for personal gain.

The study also found that falsification of personnel records is common in Nsukka Local Government Civil Service. This includes alteration of employment dates, grade levels, and qualifications to secure undue financial benefits. This finding aligns with Adeleke (1996), who identified falsification of official records as a major form of administrative fraud in the public sector, particularly in personnel management.

In addition, absenteeism and truancy from duty were identified as fraudulent practices, where employees receive salaries without regular attendance at work. This finding is consistent with Olugbemi (2017), who observed that lack of effective attendance monitoring systems in public institutions encourages absenteeism and undermines productivity. The absence of biometric attendance systems in many local governments further exacerbates this problem.

The study further revealed the existence of collusion among staff, especially between payroll officers and other employees, to perpetrate fraudulent acts. This supports the argument of Dickson (2020), who emphasized that corruption in the civil service is often systemic and sustained through networks of collusion rather than isolated individual actions.

From a theoretical standpoint, the prevalence of these fraudulent practices reflects a deviation from

Max Weber's Bureaucratic Theory, which emphasizes formal rules, accountability, and impersonality in public administration. The persistence of fraud in Nsukka Local Government Civil Service indicates weak enforcement of bureaucratic rules and inadequate institutional controls.

What biometric verification systems are available for addressing fraudulent practices in Nsukka Local Government Area, Enugu State?

The findings of this study revealed that the availability of biometric verification systems in Nsukka Local Government Area is very limited. The results showed that only the fingerprint recognition system is available, while other biometric systems such as facial recognition, iris recognition, voice recognition, hand geometry, palm print, vein pattern recognition, and biometric access control systems are not available.

This finding suggests that Nsukka Local Government relies largely on basic biometric technology for personnel verification and fraud control. The limited availability of biometric systems indicates a weak technological infrastructure for combating sophisticated fraudulent practices such as payroll manipulation, identity impersonation, and unauthorized system access.

This finding aligns with the submission of Adebayo (2018), who observed that most Nigerian local governments adopt only basic biometric systems due to financial constraints, inadequate technical expertise, and poor infrastructure. Similarly, Elekwa and Eme (2013) noted that the use of fingerprint-based systems dominates public sector biometric applications in Nigeria because they are relatively cheaper and easier to deploy compared to advanced biometric technologies.

Furthermore, Olugbemi (2017) argued that while fingerprint biometrics can help reduce ghost worker syndrome, reliance on a single biometric modality weakens fraud detection mechanisms, especially in cases of fingerprint wear, spoofing, or system manipulation. This supports the present finding that the absence of multiple biometric systems limits the effectiveness of fraud control efforts in Nsukka Local Government Area.

From an educational administration and policy perspective, UNESCO (2019) emphasizes that effective institutional management, including fraud prevention, requires the integration of modern technologies capable of ensuring transparency,



accountability, and efficiency. The limited availability of biometric verification systems observed in this study therefore undermines the capacity of the local government to effectively manage its human resources and public funds.

In summary, the finding indicates that biometric verification systems available in Nsukka Local Government Area are grossly inadequate and restricted to basic fingerprint recognition technology. This limited availability constrains the local government's ability to effectively address fraudulent practices and corruption within the civil service.

Conclusion

This study examined the effectiveness of biometric verification systems on fraud control and corruption in Nsukka Local Government Civil Service, Enugu State, Nigeria. Based on the findings of the study, it can be concluded that biometric verification systems have the potential to enhance accountability and reduce fraudulent practices in the civil service; however, their effectiveness in Nsukka Local Government Area is currently limited by inadequate availability and deployment.

The study revealed that the biometric verification infrastructure in Nsukka Local Government Area is grossly inadequate, with only the fingerprint recognition system available, while other advanced biometric systems such as facial recognition, iris recognition, voice recognition, hand geometry, palm print, vein pattern recognition, and biometric access control systems are absent. This limited availability indicates a weak technological framework for effective fraud prevention.

Furthermore, the study established that although the available fingerprint-based biometric system has contributed to reducing certain fraudulent practices such as ghost worker syndrome and unauthorized salary payments, its impact remains moderate. The absence of integrated and multi-modal biometric systems restricts the local government's capacity to address complex and systemic fraudulent practices comprehensively.

The study also concluded that fraudulent practices such as ghost workers, payroll manipulation, falsification of personnel records, absenteeism, and collusion among staff are prevalent in Nsukka Local Government Civil Service. These practices persist largely due to weak internal control mechanisms, inadequate monitoring systems, and insufficient application of modern verification technologies.

Finally, while biometric verification systems represent an effective tool for fraud control in public administration, their limited adoption and implementation in Nsukka Local Government Area undermine their full potential. For biometric verification systems to effectively curb fraud and corruption in the civil service, there is a need for comprehensive technological integration, strong institutional support, and sustained policy commitment.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are made:

1. Integration of Biometric Systems with Payroll Management Nsukka should ensure that biometric verification systems are fully integrated with payroll and personnel management systems so that only verified staff are paid salaries.
2. Capacity Building and Training of Personnel Civil servants and system operators should be adequately trained on the use, management, and maintenance of biometric systems to enhance efficiency and reduce system manipulation.
3. Improved ICT Infrastructure and Technical Support Adequate ICT infrastructure, including reliable power supply and network connectivity, should be provided to ensure the smooth operation of biometric systems.

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