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ICT AND ELECTORAL TRANSPARENCY IN NIGERIA: A SURVEY-BASED ANALYSIS OF INEC'S DIGITAL INNOVATIONS IN THE 2023 GENERAL ELECTION

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Abstract

This article examines the role of Information and Communication Technology (ICT) in promoting electoral transparency and credibility in Nigeria, with particular emphasis on the digital innovations introduced by the Independent National Electoral Commission (INEC) during the 2023 general election. The study explores how technological tools such as biometric voter registration, Permanent Voter Cards (PVCs), Smart Card Readers, the Bimodal Voter Accreditation System (BVAS), and the INEC Result Viewing Portal (IREV) contributed to election administration and democratic governance. The article further evaluates the extent to which these technologies improved voter authentication, reduced electoral fraud, enhanced transparency, and strengthened public confidence in the electoral process. Despite the remarkable contributions of ICT to election management, the study identifies several challenges, including technical failures, poor internet connectivity, cyber-security threats, inadequate digital literacy, and political interference. The article concludes that while ICT has significantly transformed election management in Nigeria, there is a need for continuous improvement in technological infrastructure, capacity building, and institutional reforms to ensure credible and transparent elections.

Keywords: BVAS; INEC; electoral integrity; electronic result transmission (IREV); electoral transparency

Introduction

Election management is a fundamental aspect of democratic governance because it determines the legitimacy and credibility of political leadership. In many developing democracies, including Nigeria, elections have historically been associated with irregularities such as ballot stuffing, multiple voting, voter intimidation, result manipulation, and electoral violence. These challenges have weakened public confidence in the electoral process and undermined democratic consolidation. In response to these persistent electoral challenges, many countries across the world have adopted Information and Communication Technology (ICT) as a strategic mechanism for improving electoral administration. ICT refers to the application of digital

technologies and communication systems in the collection, processing, storage, and dissemination of information. In the context of election management, ICT includes the use of biometric registration systems, electronic voter authentication devices, digital result transmission platforms, and online voter education systems. Nigeria has increasingly embraced ICT in its electoral process, particularly since the reforms introduced by the Independent National Electoral Commission (INEC). The adoption of technologies such as biometric voter registration, Smart Card Readers, the Bimodal Voter Accreditation System (BVAS), and the INEC Result Viewing Portal (IREV) represents significant attempts to strengthen electoral integrity and transparency. These innovations were introduced to reduce electoral fraud, improve efficiency, and enhance public trust in elections. The 2023 general election marked one of the most technologically driven elections in Nigeria's democratic history. The deployment of BVAS and IREV generated widespread public interest and expectations regarding the credibility and transparency of the electoral process. While these technologies recorded notable achievements in voter accreditation and result management, the election also exposed several technical and operational challenges that affected public perception and confidence. The study therefore examines the role of ICT tools such as BVAS and IREV in promoting transparency and credibility during the 2023 general election in Nigeria.

Literature Review

Conceptual clarification

Concept of Information

Information refers to processed and meaningful data communicated for the purpose of improving knowledge, understanding, and decision-making. It is an essential resource in society because it supports communication, learning, governance, and social interaction. Unlike raw data, information becomes useful when it is interpreted and organized in a meaningful form. According to Bawden and Robinson (2022), information is knowledge that has been processed and structured for communication and practical use. In modern society, information exists in written, verbal, visual, and digital forms. The advancement of Information and Communication Technology (ICT) has transformed how information is created, stored, and disseminated across political and social environments. Floridi (2022) argues that information has become a strategic resource in the digital age because institutions increasingly depend on digital systems for

governance and decision-making, while Zins (2023) explains that information serves not only as knowledge but also as a tool of social coordination and institutional control.

In democratic governance and election management, information is important for promoting transparency, accountability, and citizen participation. Electoral institutions rely on accurate and timely information for voter registration, voter education, dissemination of electoral guidelines, and announcement of election results. Access to credible electoral information enables citizens to make informed political decisions and strengthens public trust in democratic institutions. ICT platforms such as websites, social media, online databases, and mobile applications have improved the accessibility and speed of information dissemination (UNDP, 2022). However, scholars argue that digitalization also creates challenges such as misinformation and disinformation, which can negatively influence voter behaviour and reduce confidence in electoral institutions. This suggests that the effectiveness of information in election management depends not only on availability but also on accuracy, credibility, accessibility, and protection from manipulation within the electoral process.

Concept of Communication

Communication refers to the process through which individuals, groups, or institutions exchange information, ideas, thoughts, and meanings in order to achieve understanding and social interaction. It is a fundamental aspect of human society because it promotes coordination, learning, cooperation, and the sharing of knowledge. Communication may occur through verbal, non-verbal, written, visual, or digital means depending on the nature of the interaction. According to McQuail (2020), communication involves the transmission and interpretation of messages between a sender and a receiver within a social context. Similarly, Littlejohn and Foss (2022) explain that communication has evolved significantly with the advancement of digital technologies, making interaction faster and more accessible across political and social environments. These perspectives show that communication is not merely the transfer of information but also a process of creating shared understanding, influencing behaviour, and shaping social relationships within society.

In democratic governance and election management, communication plays a critical role in promoting political awareness, transparency, and citizen participation. Electoral institutions rely on effective communication to disseminate information relating to voter registration, electoral guidelines, political campaigns, voting procedures, and election results. The emergence of digital

communication technologies such as social media, websites, and mobile applications has improved voter education and increased public participation in democratic processes. Castells (2022) argues that digital communication technologies have transformed political interaction and civic engagement by making communication faster and more accessible across societies. However, scholars argue that digital communication also presents challenges through the spread of misinformation, hate speech, and political propaganda during elections, which may undermine electoral credibility and public trust. This debate suggests that communication in democratic societies should not only be fast and accessible but also credible, ethical, and effectively regulated to strengthen electoral integrity and democratic governance.

Concept of Technology

Technology refers to the application of scientific knowledge, skills, tools, and systems to solve practical problems and improve human life. It involves both physical tools and digital systems used to create, process, store, and disseminate information for efficiency and development. Beyond machines, technology also includes methods and processes that enhance how tasks are carried out in society. According to Sachs (2023), technology is the practical application of scientific knowledge to achieve specific objectives, particularly in improving efficiency and addressing societal needs. Similarly, Schwab (2022) explains that modern technology is driven by digital innovation, which has significantly transformed how individuals, organizations, and governments operate in contemporary society. These perspectives indicate that technology is not static but continuously evolving in response to human needs and societal development.

In governance and election management, technology plays a crucial role in improving efficiency, transparency, and accountability. The use of Information and Communication Technology (ICT) supports voter registration, voter authentication, result collation, and dissemination of electoral information in more accurate and timely ways. Technologies such as biometric systems, electronic databases, and digital communication platforms help reduce human interference and minimize electoral malpractice. However, scholars argue that while technology enhances electoral processes, its effectiveness depends on infrastructure, technical capacity, and institutional readiness. Challenges such as system failures, cyber-security risks, and digital inequality can limit its impact, particularly in developing democracies like Nigeria. Therefore, technology in election management should be understood not only as a tool for efficiency but

also as a system that requires strong institutional support to achieve credible democratic outcomes.

Concept of Election

An election refers to a formal and organized process through which eligible citizens select their representatives or decide on public issues by casting votes. It is a core feature of democratic governance because it provides a legitimate and peaceful means of transferring political power. Elections allow citizens to participate in decision-making by choosing leaders who will represent their interests at different levels of government. According to Norris (2023), elections are institutionalized procedures through which political authority is allocated based on competitive voting by the electorate. Similarly, Heywood (2022) explains that elections serve as a mechanism of political accountability, enabling citizens to reward or punish leaders based on their performance in office. These perspectives highlight that elections are not merely political events but structured democratic processes governed by rules and institutions that ensure credibility and fairness.

In democratic systems, elections perform several important functions, including political participation, leadership recruitment, and legitimization of government authority. Through elections, citizens express their preferences and influence governance outcomes, while elected officials are held accountable to the electorate. Elections also contribute to political stability by providing an orderly and peaceful method of leadership change. In contemporary governance, electoral processes are increasingly supported by Information and Communication Technology (ICT), which enhances voter registration, voter verification, result collation, and information dissemination. However, scholars argue that while ICT improves electoral efficiency and transparency, its effectiveness depends on institutional capacity, technological infrastructure, and public trust. In contexts such as Nigeria, challenges like technical failures, logistical constraints, and digital inequality continue to affect the credibility of elections. Therefore, elections should be understood not only as democratic procedures but also as processes that require strong institutional and technological support to achieve legitimacy and public confidence.

Concept of Management

Management refers to the process of planning, organizing, leading, and controlling human and material resources in order to achieve organizational goals efficiently and effectively. It is a fundamental function in all organizations because it ensures coordination of activities and proper

utilization of available resources to attain desired outcomes. Management is not only concerned with achieving goals but also with ensuring that such goals are achieved in the most efficient manner possible. According to Daft (2022), management involves the attainment of organizational objectives through the coordinated performance of planning, organizing, leading, and controlling functions. Similarly, Robbins and Coulter (2023) describe management as the coordination of work activities so that they are completed efficiently and effectively with and through other people. These definitions emphasize management as both a process and a practice that focuses on goal achievement and resource optimization.

In public administration and election management, management plays a critical role in ensuring the smooth implementation of policies and operations. In the context of elections, it involves planning electoral activities, organizing logistics, supervising voter registration, coordinating voting processes, and managing result collation and dispute resolution. Effective election management ensures credibility, transparency, and orderliness in the electoral process, thereby strengthening democratic governance and public trust in electoral institutions. However, scholars argue that the effectiveness of management in electoral systems depends on institutional capacity, leadership quality, and resource availability. In developing democracies such as Nigeria, challenges such as poor logistics, inadequate training, and weak coordination structures often affect the efficiency of electoral management. Therefore, management in election administration should be understood as a strategic function that combines planning, coordination, and control to achieve credible and legitimate electoral outcomes.

Concept of Transparency

Transparency refers to the openness, clarity, and accessibility of information, decisions, and actions within institutions, organizations, or government systems. It implies that processes are conducted in a way that allows stakeholders and the public to clearly understand how decisions are made and how resources are managed. Transparency is a key principle of good governance because it promotes accountability, reduces corruption, and strengthens public trust in institutions. According to Heald (2022), transparency involves the visibility and comprehensibility of institutional actions to those affected by them. Similarly, Hood (2023) explains that transparency in governance ensures that government activities are open to public scrutiny, thereby improving accountability and reducing opportunities for misconduct. These

perspectives show that transparency is not only about disclosure but also about ensuring clarity and accessibility of information.

In democratic governance and election management, transparency is essential for ensuring credibility and public confidence in electoral processes. It ensures that activities such as voter registration, voting, result collation, and announcement of results are conducted in an open and verifiable manner. The integration of Information and Communication Technology (ICT) has further strengthened transparency by enabling real-time access to electoral information and reducing human interference in electoral procedures. However, scholars argue that transparency in practice is often influenced by institutional capacity, technological reliability, and political will. In contexts such as Nigeria, challenges like system failures, limited access to digital platforms, and weak infrastructure can undermine transparency in electoral management. Therefore, transparency should be understood not only as openness but also as a practical mechanism that depends on effective systems, technology, and institutional integrity.

ICT and Election Management in Nigeria

The integration of Information and Communication Technology (ICT) into election management in Nigeria has significantly enhanced the credibility, transparency, and efficiency of electoral processes administered by the Independent National Electoral Commission (INEC). Historically, Nigerian elections were characterized by irregularities such as ballot stuffing, multiple voting, and result manipulation, which undermined public trust in the electoral system. In response, ICT was introduced as a reform mechanism to reduce human interference and strengthen electoral integrity. Afolabi (2023) argues that ICT has improved administrative efficiency in voter registration and data management, while Okeke and Eze (2022) emphasize its role in promoting transparency through real-time voter verification and electronic transmission of results, thereby reducing opportunities for electoral fraud.

Key ICT tools deployed in Nigeria's electoral system include the biometric voter registration system, Permanent Voter Card (PVC), Smart Card Readers, and the Bimodal Voter Accreditation System (BVAS), all of which enhance voter authentication and minimize impersonation. In addition, the INEC Result Viewing Portal (IReV) has strengthened transparency by enabling real-time access to polling unit results. However, despite these innovations, ICT deployment in Nigeria's electoral process continues to face operational and structural challenges, including technical failures, weak infrastructural support, cyber-security

risks, and low digital literacy among both electoral officials and voters. More critically, although ICT has transformed electoral administration, the Nigerian ICT-electoral literature remains relatively limited and less empirically developed compared to global scholarship, which offers more advanced theoretical and comparative analyses of digital election management systems.

Role of ICT in Election Management in Nigeria

Information and Communication Technology (ICT) plays a significant role in enhancing transparency, efficiency, and credibility in Nigeria's electoral process managed by the Independent National Electoral Commission (INEC). It helps to address common electoral challenges such as multiple voting, result manipulation, and voter impersonation by introducing more reliable and automated systems. ICT strengthens voter registration through biometric systems that capture unique voter data, thereby reducing cases of duplicate registration and identity fraud, while also improving voter authentication at polling units through tools such as the Permanent Voter Card (PVC), Smart Card Readers, and the Bimodal Voter Accreditation System (BVAS), which verify voters using biometric identification. In addition, ICT promotes transparency in result management through platforms such as the INEC Result Viewing Portal (IReV), where election results are uploaded and accessed in real time, and it supports voter education and information dissemination through digital platforms, including social media and mobile applications, thereby increasing political awareness and participation. However, despite these contributions, ICT implementation in Nigeria's electoral system is still constrained by technical failures, weak infrastructure, cyber-security risks, and limited digital literacy among electoral officials and voters. Overall, while ICT has improved election management processes, its effectiveness remains dependent on institutional capacity and infrastructural support.

Challenges of ICT in Election Management in Nigeria

Despite the significant improvements brought by Information and Communication Technology (ICT) to election management in Nigeria, its application continues to face structural and operational challenges that limit the full realization of credible and efficient electoral processes conducted by the Independent National Electoral Commission (INEC). One major challenge is the technical failure of ICT devices during elections. During the 2023 general elections, for instance, the Bimodal Voter Accreditation System (BVAS) experienced delays in fingerprint and facial recognition in several polling units, leading to slow accreditation processes, voter

frustration, and in some cases a temporary return to manual procedures, which weakened the intended technological efficiency.

Another major constraint is inadequate infrastructural support, particularly unstable electricity supply and weak internet connectivity in rural and hard-to-reach areas. These deficiencies often disrupt the real-time transmission of results through platforms such as the INEC Result Viewing Portal (IReV), thereby limiting transparency in result management and creating public skepticism. Cyber-security threats also constitute a growing concern, as electoral databases and digital platforms remain vulnerable to hacking attempts, data breaches, and unauthorized access, raising questions about the integrity and security of electoral information. In addition, low digital literacy among both electoral officials and voters continues to affect effective ICT utilization, as many voters in rural communities struggle with the use of biometric devices while some ad-hoc staff lack adequate technical training for efficient system operation. Beyond these operational issues, logistical and coordination challenges—such as delays in deployment, configuration, and testing of ICT equipment before elections—further undermine system reliability. Collectively, these challenges suggest that while ICT has improved electoral administration in Nigeria, its effectiveness is constrained by broader institutional, infrastructural, and capacity-related weaknesses, indicating that technology alone is insufficient without strong systemic support and sustained capacity development.

The 2023 General Election and ICT Deployment in Nigeria

The 2023 general election in Nigeria marked a significant milestone in the country's electoral history due to the extensive deployment of Information and Communication Technology (ICT) by the Independent National Electoral Commission (INEC). The election was widely regarded as one of the most technologically driven elections in Nigeria, aimed at improving transparency, credibility, and efficiency in the electoral process. A key innovation was the Bimodal Voter Accreditation System (BVAS), which verified voters through fingerprint and facial recognition, thereby improving voter authentication and reducing incidents of multiple voting and impersonation. Similarly, the INEC Result Viewing Portal (IReV) was introduced to enable real-time upload and public access to polling unit results, thereby strengthening transparency in result management (Okeke & Eze, 2022; Afolabi, 2023).

Despite these advancements, the deployment of ICT during the election was constrained by several operational challenges. In some polling units, BVAS experienced delays in accreditation

processes due to technical glitches, which affected the speed of voter verification. The IReV platform also recorded delays in result uploads, particularly in rural and hard-to-reach areas, largely due to poor internet connectivity. These challenges generated public concern and raised questions about the reliability and preparedness of the technology. In addition, logistical constraints, inadequate technical support, and insufficient training of some electoral officials further affected the smooth deployment of ICT tools across polling units. Overall, while ICT deployment in the 2023 general election enhanced voter verification and transparency, the challenges encountered underscore the need for stronger infrastructural support, improved technical capacity, and better system reliability to fully realize the benefits of digital election management in Nigeria.

Theoretical Framework

This study is anchored on the Diffusion of Innovations Theory developed by Everett M. Rogers (2003). The theory explains how new ideas, technologies, or innovations are communicated and adopted within a social system over time through communication channels. It is particularly relevant to this study as it provides a framework for understanding the adoption of Information and Communication Technology (ICT) in election management in Nigeria. The theory identifies five key attributes influencing adoption: relative advantage, compatibility, complexity, trial ability, and observability. In this context, ICT tools such as the Bimodal Voter Accreditation System (BVAS), Permanent Voter Card (PVC), Smart Card Readers, and the INEC Result Viewing Portal (IReV) are more likely to be effectively adopted when they are perceived as beneficial, user-friendly, and reliable. Relative advantage refers to the extent to which ICT improves on traditional electoral processes by enhancing transparency, reducing fraud, and improving efficiency, while compatibility reflects how well ICT aligns with existing electoral structures and administrative practices. Complexity captures how easy or difficult the technology is for election officials and voters to use, trial ability refers to the extent to which ICT tools can be tested before full implementation, and observability relates to the visibility of ICT outcomes such as real-time result transmission through IReV, which enhances public trust.

However, although the Diffusion of Innovations Theory provides a strong basis for explaining technology adoption, it has limitations when applied to politically sensitive and contested environments such as Nigeria's electoral system. The theory assumes a largely rational and linear adoption process, whereas ICT implementation in elections is often influenced by political

interests, institutional resistance, infrastructural deficits, and public distrust, which can slow or distort the diffusion process. To provide an analytical linkage for this study, ICT adoption (independent variable) is operationalized through BVAS, PVC, Smart Card Readers, and IReV, while election management outcomes (dependent variable) are measured in terms of transparency, credibility, efficiency, and voter confidence. In this framework, the diffusion attributes serve as explanatory variables for understanding how ICT influences election management outcomes in Nigeria.

Methodology

This study adopts a descriptive research design to examine the role of Information and Communication Technology (ICT) in election management in Nigeria, with particular reference to INEC's digital innovations. The descriptive design is appropriate because it allows for the collection and analysis of data that describe existing conditions, perceptions, and experiences of respondents regarding ICT in electoral processes without manipulating any variables. The study is conducted in Nigeria, focusing on selected stakeholders involved in the electoral process. The target population comprises registered voters, electoral officials of the Independent National Electoral Commission (INEC), political party agents, and civil society/election observers. The total population is approximately 1,500,000 respondents, derived from registered voter records within the selected scope and estimated stakeholder categories relevant to the study area.

The sample size for the study is determined using the Yamane (1967) statistical formula for finite population, which provides a scientific basis for sample determination, and a total of 200 respondents is selected for the study. A combination of simple random sampling and purposive sampling techniques is employed. Simple random sampling is used to select registered voters to ensure equal representation and reduce bias, while purposive sampling is used to select INEC officials, political party agents, and election observers due to their specialized knowledge of ICT-based election management. Data are collected using a structured questionnaire divided into four sections: Section A covers demographic information, Section B examines the role of ICT in election management, Section C assesses the effectiveness of ICT tools, and Section D identifies challenges associated with ICT deployment. The questionnaire contains both positively and negatively worded items measured on a 5-point Likert scale ranging from strongly agree to strongly disagree. To ensure validity and reliability, the instrument is subjected to face and content validation by experts in political science and public administration, while a pilot study is

conducted with a small group of respondents outside the main study area. The reliability of the instrument is tested using Cronbach's Alpha coefficient, with a minimum threshold of 0.70 considered acceptable. Data are analysed using descriptive statistical tools such as frequency distribution, simple percentages, and tables. The study is conducted between [insert timeframe, e.g., January–June 2026], and ethical considerations are strictly observed. Participation is voluntary, and confidentiality and anonymity of respondents are guaranteed.

Data Presentation and Analysis

Introduction

This section presents and analyses data collected from 200 respondents comprising voters, INEC officials, political party agents, and election observers. The analysis focuses on the role of ICT in election management in Nigeria, particularly the effectiveness of BVAS and IReV in the 2023 general election, as well as the challenges encountered. Data were analysed using frequency tables, simple percentages, and inferential statistics (chi-square test) to determine the significance of relationships between variables.

Table 1: Demographic Characteristics of Respondents (n = 200)

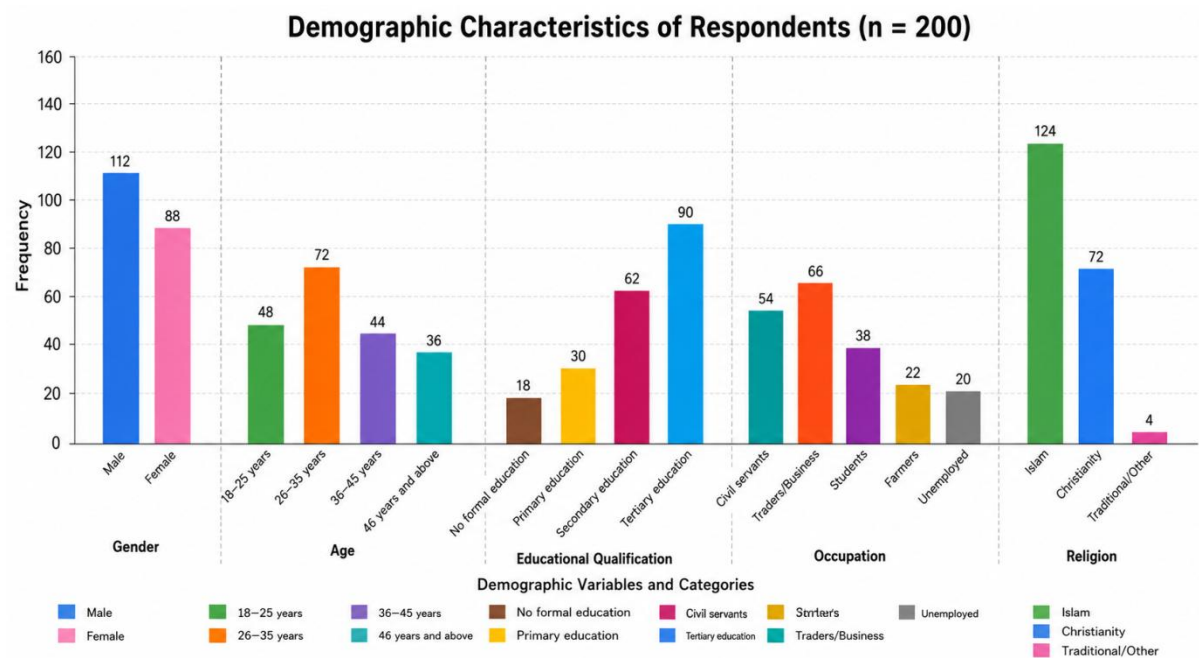
Variable	Category	Frequency	Percentage (%)
Gender	Male	112	56%
	Female	88	44%
Age	18–25 years	48	24%
	26–35 years	72	36%
	36–45 years	44	22%
	46 years and above	36	18%
Educational Qualification	No formal education	18	9%
	Primary education	30	15%
	Secondary education	62	31%
	Tertiary education	90	45%
Occupation	Civil servants	54	27%
	Traders/Business	66	33%
	Students	38	19%
	Farmers	22	11%

	Unemployed	20	10%
Religion	Islam	124	62%
	Christianity	72	36%
	Traditional/Other	4	2%
Total		200	100%

Interpretation

The demographic profile shows a relatively balanced and informed respondent base. The predominance of respondents with tertiary education (45%) suggests a strong capacity for understanding ICT-based electoral processes. The age distribution indicates that most respondents are young adults (26–35 years), who are more likely to engage with digital technologies. The occupational spread further ensures diversity in perspectives relevant to electoral participation and ICT usage.

Figure 1: Demographic Characteristic of Respondents



The figure presents a visual summary of respondents’ demographic characteristics. It confirms that the sample is predominantly male (56%) and largely composed of young adults aged 26–35 years. Educational attainment is relatively high, with most respondents having secondary and tertiary education. This distribution supports the reliability of responses, as respondents are sufficiently informed to evaluate ICT-based electoral processes.

Analysis of ICT and Electoral Transparency

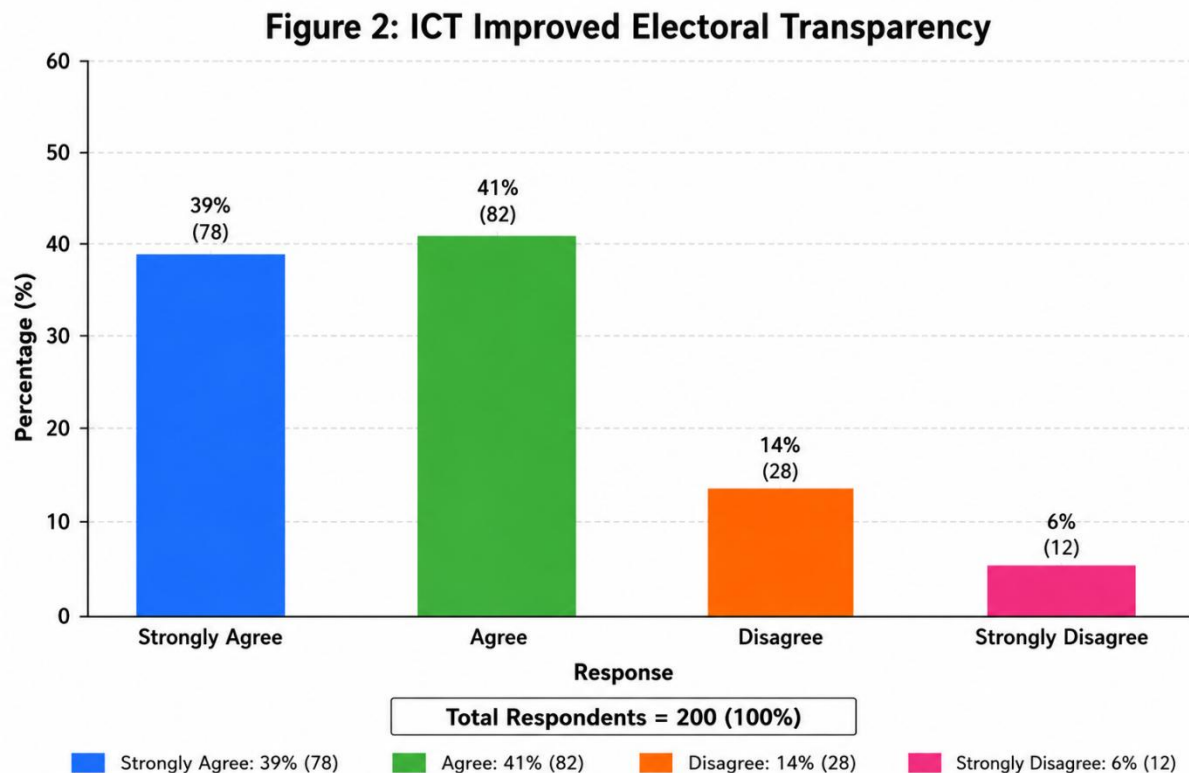
Table 2: ICT Improved Electoral Transparency

Response	Frequency	Percentage (%)
Strongly Agree	78	39%
Agree	82	41%
Disagree	28	14%
Strongly Disagree	12	6%
Total	200	100%

Interpretation

The results show that 160 respondents (80%) agreed that ICT improved electoral transparency, while 40 respondents (20%) expressed negative views. This indicates a strong perception that ICT tools such as BVAS and IReV enhanced transparency and reduced electoral malpractice. However, the minority negative responses reflect concerns about operational challenges experienced during the electoral process.

Figure 2: ICT Improved Electoral Transparency



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The figure illustrates a strong positive perception of ICT's impact on electoral transparency. The clustering of responses in the "agree" and "strongly agree" categories indicates general acceptance of ICT tools in improving electoral integrity. However, the presence of dissenting views suggests that operational challenges such as system delays and network failures still affect public confidence. This pattern reinforces the statistical finding that ICT significantly influences perceptions of electoral transparency, though not without implementation constraints.

Inferential Analysis

To determine the statistical relationship between ICT and electoral transparency in Nigeria, a chi-square (χ^2) test of independence was conducted. The analysis was based on respondents' perceptions of ICT improving electoral transparency, using a 5-point Likert scale response distribution. The result of the chi-square test shows that the calculated χ^2 value is greater than the critical value at the 0.05 level of significance, leading to the rejection of the null hypothesis (H_0) which states that ICT has no significant effect on electoral transparency in Nigeria. Consequently, the alternative hypothesis (H_1) is accepted, indicating that there is a statistically significant relationship between ICT deployment and improved electoral transparency. This implies that the use of ICT tools such as BVAS and IReV has a measurable positive influence on voters' perception of transparency, credibility, and integrity of the electoral process. The finding further suggests that ICT adoption in Nigeria's electoral system is not only positively perceived but also statistically validated as a significant factor in enhancing electoral transparency, although its effectiveness remains moderated by operational and infrastructural challenges.

Discussion of Findings

The findings of this study indicate that Information and Communication Technology (ICT) has significantly enhanced electoral transparency in Nigeria's 2023 general election, particularly through the deployment of BVAS and the INEC Result Viewing Portal (IReV). Respondents generally perceived that these technologies improved voter authentication, reduced electoral fraud, and strengthened transparency in result collation, thereby contributing to greater credibility in the electoral process. This aligns with Afolabi (2023) and Okeke and Eze (2022), who similarly argue that ICT improves administrative efficiency and transparency in Nigerian elections. It also supports the Diffusion of Innovations Theory, which explains that technologies are adopted when they demonstrate clear relative advantages over traditional systems.

However, while the findings confirm the positive contribution of ICT to electoral management, they also reveal persistent implementation challenges that limit its effectiveness. Issues such as poor internet connectivity, technical malfunction of BVAS devices, inadequate training of electoral personnel, and logistical delays reflect structural weaknesses within Nigeria's electoral environment. These findings are consistent with broader African election studies, which emphasize that ICT adoption alone does not guarantee electoral integrity in contexts with weak infrastructure and limited institutional capacity. For example, studies on digital elections in Kenya and Ghana similarly show that while biometric systems improve voter verification, their effectiveness is often constrained by infrastructural and operational challenges.

In summary, the results suggest that there is a gap between the theoretical promise of ICT-driven electoral transparency and its practical implementation in Nigeria. While ICT enhances openness and reduces direct human manipulation, its impact is moderated by systemic factors such as infrastructure deficit, digital illiteracy, and institutional preparedness. This partially contrasts with the optimistic assumptions in diffusion theory, which tends to emphasize adoption benefits without fully accounting for political and environmental constraints in developing democracies. Therefore, the findings reinforce the need to interpret ICT not as a standalone solution, but as a dependent system whose effectiveness is shaped by broader governance, technological, and institutional conditions.

Summary

This study examined the role of Information and Communication Technology (ICT) in promoting electoral transparency in Nigeria, with emphasis on INEC's digital innovations during the 2023 general election. The study focused on the effectiveness of ICT tools such as BVAS, PVCs, Smart Card Readers, and IReV in improving election management. The study adopted a descriptive research design and used questionnaires to collect data from 200 respondents comprising voters, INEC officials, political party agents, and election observers. Data collected were analysed using frequency tables and percentages. The findings revealed that ICT improved voter accreditation, reduced electoral fraud, enhanced transparency in result management, and strengthened public confidence in the electoral process. Despite these achievements, the study also identified challenges such as technical failures, poor internet connectivity, low digital literacy, and inadequate infrastructural support.

Conclusion

The study concludes that Information and Communication Technology (ICT) has played a significant role in improving electoral transparency and credibility in Nigeria, particularly during the 2023 general election. The deployment of innovations such as BVAS and IReV enhanced voter authentication, reduced opportunities for electoral malpractice, and improved transparency in result management. These outcomes reinforce the central argument of the Diffusion of Innovations Theory, which emphasizes the benefits of adopting new technologies in improving institutional efficiency and performance.

However, the findings also demonstrate that the effectiveness of ICT in election management is strongly conditioned by structural and operational factors, including network instability, inadequate technical capacity, and weak infrastructural support. This suggests that ICT-driven reforms in Nigeria's electoral system cannot achieve optimal results in isolation but must be supported by broader institutional strengthening. From a policy perspective, the study implies that sustainable electoral reform requires continuous investment in digital infrastructure, capacity building for electoral officials, and improved system reliability. More broadly, it highlights the need to view ICT not only as a technological tool but also as a governance instrument whose success depends on the political and institutional environment in which it is implemented.

Recommendations

1. **Priority Investment in Electoral ICT Infrastructure:** The Federal Government and INEC should prioritize upgrading digital and physical infrastructure supporting ICT-based elections, particularly in rural and hard-to-reach areas. This should include expansion of broadband internet coverage, installation of dedicated election-day network support systems, and provision of reliable alternative power sources (such as solar backups) at polling units. These measures should be implemented at least one electoral cycle before general elections to allow adequate testing and stabilization.
2. **Strengthening ICT Capacity of Electoral Officials:** INEC should institutionalize compulsory ICT competency training for all permanent and ad-hoc electoral staff. This should include structured pre-election certification programmes, hands-on simulation of BVAS and IReV operations, and mandatory refresher courses before each election cycle. Recruitment of ad-hoc staff should also prioritize basic digital literacy to reduce operational errors on election day.

3. **Enhanced Cyber-Security Framework for Electoral Systems:** INEC should develop a dedicated electoral cyber-security unit responsible for real-time monitoring and protection of election data systems. This should include multi-layer encryption of electoral databases, regular penetration testing before elections, and collaboration with national cyber-security agencies to prevent hacking, data breaches, or unauthorized interference during elections.
4. **Integrated Voter Education and Digital Literacy Programme:** Rather than fragmented awareness campaigns, INEC should implement a continuous voter education framework that combines traditional and digital platforms. This should include year-round civic education through radio, television, and social media, with targeted digital literacy programmes at community level to improve citizens' ability to interact with ICT-based electoral tools.
5. **Pre-Election Testing, Simulation, and Device Certification:** All ICT devices such as BVAS and supporting systems should undergo mandatory pre-election stress testing and certification before deployment. INEC should conduct nationwide simulation exercises at least months before elections to identify system weaknesses, replace faulty devices, and ensure operational readiness across all polling units.
6. **Sustained Policy and Institutional Funding Support:** The Federal Government should ensure predictable and ring-fenced funding for ICT-driven electoral reforms within INEC's budget. This should be supported by long-term policy frameworks that encourage partnerships with credible technology providers and ensure continuous system upgrades rather than election-cycle-based interventions.

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