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THE ROLE OF TECHNOLOGY IN NIGERIA 2019 AND 2023 GENERAL ELECTIONS

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Abstract

This article explores how technology has reduced electoral malpractices such as ballot stuffing, voting by proxy, result collation manipulations and over-voting in Nigeria's 2019 and 2023 elections. It further highlights the strength, challenges and possible recommendations. The Nigerian Independent National Electoral Commission (INEC) has embraced innovative technologies to improve election administration and conduct. These include: INEC Voter Enrolment Device (IVED), Bimodal Voter Accreditation System (BVAS), INEC Result Viewing (IReV), Collation Support and Result Verification System (CSRVS), and political party and observer online nomination and accreditation platforms. Studies show that in each election cycle, INEC's technological capabilities advanced to match international standards as it deployed novel technologies. Results show that the above technologies have reduced multiple registrations; multiple voting and a drastic reduction in manipulation of election results at collation centres. ICT has helped Nigeria to minimise electoral fraud and create credible elections for the sustenance of democracy.

KEYWORDS:

INEC, Technology, BVAS, Election, IReV

1. INTRODUCTION

ICTs are used daily in many countries for communication, trade, finance, education, work quality, and pleasure [1-4]. Most nations hold digital elections [5-6]. Most EMBs use cutting-edge technology to improve elections (ACE, 2023). Technology improves voter registration, ID verification, vote counting, results transmission and tabulation, error reduction, real-time interactions, and information exchange. Elections have used optical scanners to count paper ballots, e-signing of initiative or referendum demands, e-voting and internet voting, geographic information systems for delineating boundaries and determining polling stations, locations, candidate or party endorsement lists, electronic registers, party agent and observer registration portals, biometry, blockchain, cloud computing, artificial e-citizenship, engagement, campaigning, and elections. ICT revolutions improve elections and government credibility. Pioneering nations improve openness, involvement, and democracy with technology, especially ICTs. Previous manipulation and murder have encouraged numerous African states to adopt ICT for elections. If used well, ICTs can modernise and improve continental elections [7-8]. Most nations employ electoral technology, but few use computers or Internet voting [9]. Most votes are paper. Above 90% of ACE nations and territories, hand-mark votes. Israelis and Malians choose a party, put the ballot in an envelope, and pop it in the box. Some nations mix techniques [10], and 10% of nations and territories use paper and electronic ballots. Singapore, the US, and India use e-voting [11], while Armenia, Canada, Estonia, and Switzerland vote online [12]. Gambia's 2023 presidential election drums held marbles. [13]. Fast, transparent election results may boost the legitimacy of the election administration. Conversely, unclear and delayed results might lead to worry and distrust [14]. Objection and annulment of unfair election results waste time and money [15].

Internationally, biometric election authentication is employed. User authentication is the first impersonation defence in any security system [16]. [17] claims that remote user authentication Biometric systems identify people using fingerprints, iris scans, ear scans, faces, finger veins, and hand geometry [18-19]. The blockchain technology is up for election. Blockchain technology can address voter concerns in elections by ensuring anonymity, privacy, verifiability, portability, integrity, security, and fairness [14, 20-22]. Technology in elections enhances openness, efficiency, and public participation, but it also increases security threats and technical incompetence that could lead to misinformation [23-24]. Election technology can cause equipment failure, machine integrity difficulties, hacking, vote-buying, and poor auditability [24]. Cybersecurity risks and rewards are assessed by states. New technology might be risky or expensive [6, 25]. The government has researched and tested electronic and electoral voting techniques. Election integrity and faith underpin democracy. Election preparation, vote counting, and result distribution errors can create long-term interruptions. Technology adoption is difficult, despite its popularity [25]. Election technology has more pros than cons. Elections in Nigeria benefit from technology [7, 23]. Numerous studies have examined the impacts of technologies on elections in Nigeria. These include: [7, 26-27]. However, there is a glaring gap in the literature because [7] published the most recent paper on the use of technology in Nigerian elections in 2018. During the period spanning from 2018 to 2023, INEC has undergone two election cycles, during which all the technologies deployed from 1999 to 2018 have been entirely replaced by new ones. Therefore, the significance of this study is evident.

2. MATERIALS AND METHOD

The methodology employed in this study entailed extensive interviews with experts in the field, and a direct approach of election observation with the view to thoroughly assess the technological innovations deployed by INEC from inception till 2023. In addition, a thorough review was undertaken on a wide range of academic sources, including scholarly articles, news publications, documentaries, the Nigerian constitution, the electoral act, academic papers, dissertations, election manuals, and the election official guide. Various deductions were made, issues were discovered, and various recommendations were presented for future elections in the country. The reflection article pertains to the comprehensive compilation of technologies deployed by the INEC in the period spanning from the restoration of democracy in in 1999 until 2023. Additionally, what is the impact of these technologies on the outcome of elections? Furthermore, it is important to consider the challenges that may arise through the use of the technology as well as potential solutions to address these challenges.

3. RESULT AND DISCUSSION

3.1. 2019 General Elections

Grey areas were identified in the use of the SCR following the 2015 General Election. The frequency of failures in the fingerprint scanner was high. In light of this, INEC made enhancements to the hardware of the SCR. Following the observation that the limited size of the scanner surface led to a significant rate of fingerprint failure, a decision was made to replace the existing fingerprint scanners with larger ones. The failure rate of the 2018 governorship elections in Ekiti and Osun was significantly reduced compared to the 2015 general elections following the upgrade of SCRs. The reason for this can be attributed to advancements in technology and software [28]. According to [29] and other observers of the elections. The deployment of the following technologies was reported during the 2019 general elections:

3.1.1 Collation Support and Results Verification System (CSRVS)

CSRVS is used for the first input of scores and numerical data. The application would identify any inaccuracies or miscalculations present in the figure. For instance, when the aggregate count of eligible voters surpasses the aggregate count of votes cast or Permanent Voter Cards (PVCs) gathered within a specific polling unit, the system immediately identifies such input for rectification [30].

3.1.2 Smart Card Reader registrations and white-listing

This entails online SCR-IMEI registration. Back-end servers can only receive results or accreditation statistics from SCRs with pre-registered IDs. All 176,754 2019 election Smart Card Readers were cloud-registered. SCRs must register to transmit results and accreditation data.

3.1.3. Seal in the battery/SIM compartments of SCR

The battery/SIM compartments of SCRs was sealed for security purposes, preventing hard resets that could erase configuration settings. Those found guilty should be reported to the police. Only the INEC technical team could break the seal.

3.1.4 customised SIM cards for SCRs

The service provider designed the SIM card to restrict usage to election-related activities. These SIM card sets are for SCR software communication only. A customised APN is incorporated inside the SCR's OS. The SIM card has the same APN. No device can communicate data or results to the server without this APN.

3.1.5 Dedicated VPN

INEC connected SCRs to the server using dedicated IP addresses for communication and data transmission. This ensures security and effective management. This generally works, but service providers should harmonise and improve it to make data sending and receiving easier.

3.1.6: Real-Time Tracking of Election Materials:

INEC implemented this due to electoral worker cooperation with politicians sabotaging the process. It debuted in the 2018 Ekiti gubernatorial election. All critical material vehicles for LGAs were monitored remotely. All goods arrived securely. Live INEC tracking is available online. Adobe

Figure 1: Screen display for live tracking of vehicles carrying election materials.

3.1.7 Use of social Media

The 2019 general elections in Nigeria saw an unprecedented rate of social media use. Nigerian politicians, supporters, and electorates used social media for a variety of political activities. Nigerian teenagers were very passionate about using social media to rally support for their candidates [31].

3.2. 2023 General Elections

The 2023 general elections witnessed the introduction of an entirely new set of technologies that differed from all previous technologies. A three-in-one handy device was introduced. The device which is referred to as The INEC Voter Enrolment Device (IVED) during voter registration has the ability to register voters and capture biometrics. On election day, the same device which is referred to as the Bimodal Voter Accreditation System (BVAS), is used to accredit voters either by fingerprints or facial. While using the same device to send the scan copy of the result to a dedicated server. This is referred to as INEC Results Viewing (IReV).

Figure 2: INEC Three-in-one device.

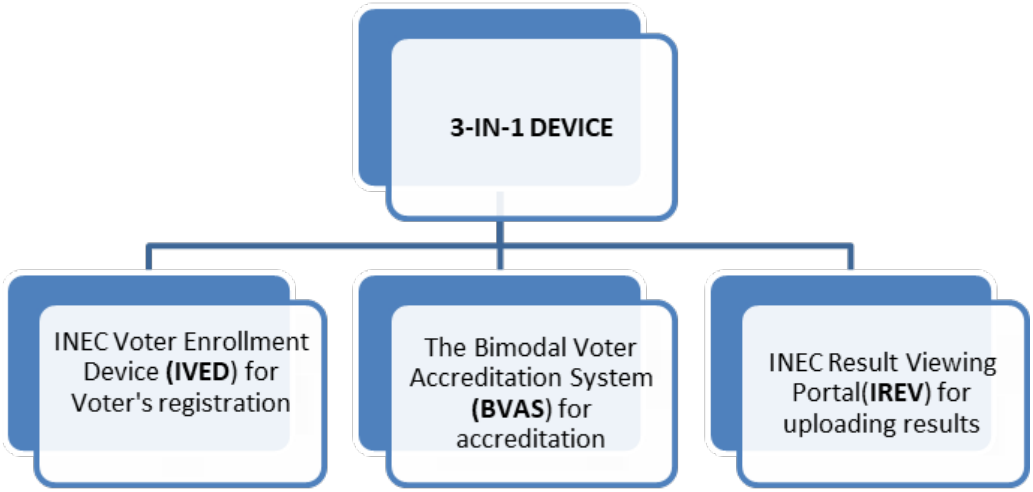


Figure 3: Figure showing how one device is used for three purposes.

Figure 3 above clearly shows how the three functions are interconnected in one device.

Bimodal Voter Accreditation System: On Election Day, voter accreditation was conducted using the BVAS. In order to access the device, the officer using it must first log in using his given credentials and face. The basic information and biometrics of every voter are contained in the BVAS. When a voter shows up at the polling place, the official uses the surname, last six digits of the VIN, barcode on the PVC, or QR Code on the EVR to look up the voter's name on the BVAS. Then, either a face or fingerprint authentication check is made. The device clearly shows the total number of accredited voters and registered voters. The Voter Identification Number (VIN) is automatically stored on the BVAS after successful accreditation which is later transmitted to the server [30].

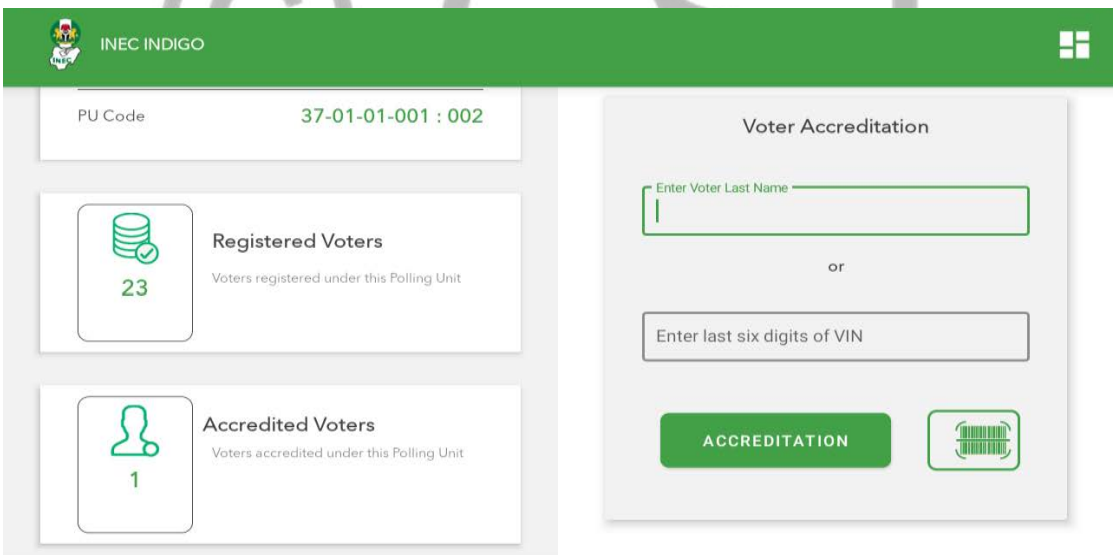


Figure 4: BVAS interface showing registered voters, Accredited Voter and voters search options

INEC Voter Enrolment Device (IVED): The IVED registers voters online and offline. In areas without internet, registration is done via an IVED app on the device and saved on the device. When an internet connection is available, the registration details are synchronised with the server. First-time voters can preregister on the portal. His basic information and a photo can be provided before scheduling biometric capture at any INEC office in the country. A slip is automatically generated after biometric capture and used to collect PVCs at the INEC Local Government Area office where the voter voted. Beyond pre-registration, voters can use the platform for other duties without visiting INEC. These include voter transfers. Voter registration can be transferred between polling units using facial authentication from home. Face authentication verifies the voter's image against the server's, allowing them to do the desired action. In addition to transfer, voters can register incident situations such PVC loss and replacement and

card updates without visiting an INEC office. In-person registration at the nearest INEC office is also allowed [29].

The INEC Result Viewing (IReV): The IReV portal displays result sheet EC8A. After entering political party scores and signing EC8A by the presiding officer and party agents, the officer must scan, upload, and sign the result sheet digitally and send it to the IReV portal for everyone to see. You can upload results via BVAS and mobile phones. Chrome login and URL are transmitted to the presiding officer. After logging in, the dashboard shows the presiding officer's assignments. In places without internet, the presiding officer can upload and digitally sign the result sheet while moving to network areas. When an internet network is found, the uploaded result will be sent automatically to the server, so the presiding officer does not need to turn off the device..

Figure 5: Result upload and signing during election result upload (a)

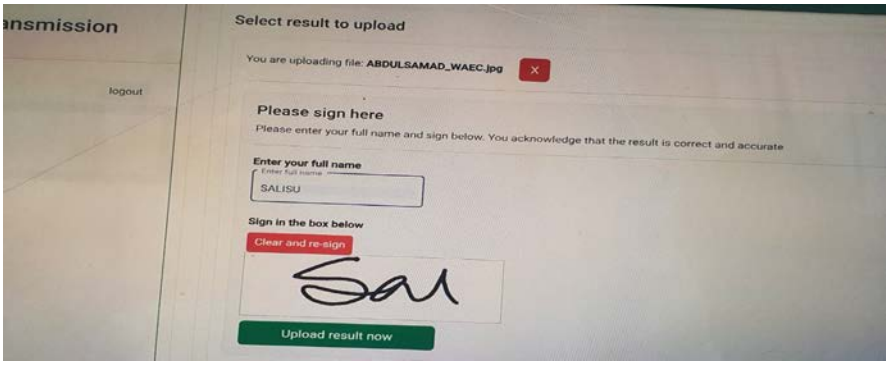
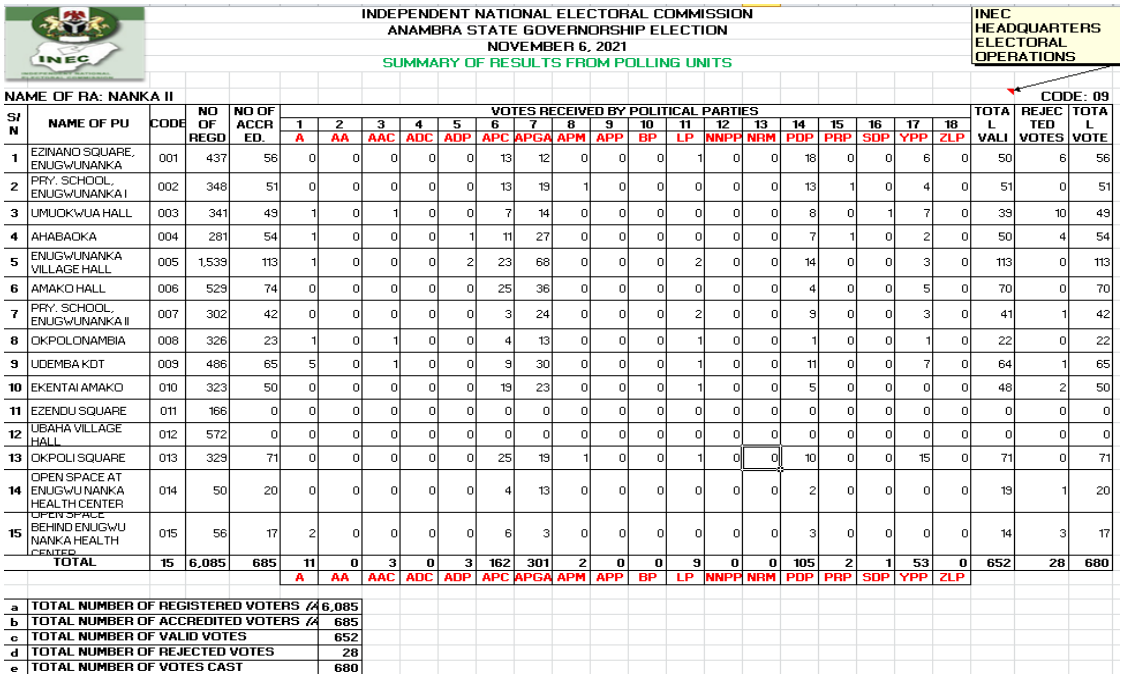


Figure 6: Result upload and signing during election result upload

The Collation Support Result Verification System (CSRVS): INEC has used its Collation Support and Results Verification System (CSRVS) for important elections for years. Recognising that human errors in election outcome compilation often tarnished public perception of elections led to the issue. Before CSRVS, Collation and Returning Officers had to carefully record each result and calculate the final results by adding rows and columns. Some cases include many rows and columns. The process often yielded errors while calculating numerical data totals. CSRVS gives INEC staff laptops and Excel spreadsheets to help Collation and Returning Officers enter and calculate data. This approach has increased precision and reduced collation time. It was done with the global NGO International Foundation for electoral System (IFES). The collation officer manually enters figures into form EC8A and uses Microsoft Excel for CSRVS. The CSRVS officer and collation officer verify calculations [30, 32].

The CSRVS enters scores and figures first. The tool would reveal figure errors. If the number of accredited voters exceeds the number of votes cast or PVC collected in the polling unit, the input is automatically highlighted for correction [30].



INDEPENDENT NATIONAL ELECTORAL COMMISSION
ANAMBRA STATE GOVERNORSHIP ELECTION
NOVEMBER 6, 2021
SUMMARY OF RESULTS FROM POLLING UNITS

INEC HEADQUARTERS ELECTORAL OPERATIONS

NAME OF RA: NANKA II — CODE: 09

S/N	NAME OF PU	CODE	NO OF REGD	NO OF ACCR ED.	VOTES RECEIVED BY POLITICAL PARTIES																TOTAL VALI	REJECTED VOTES	TOTAL VOTE
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
					A	AA	AAC	ADC	ADP	APC	APGA	APM	APP	BP	LP	NNPP	NRM	PDP	PRP	SDP	YPP	ZLP			
1	EZINANO SQUARE, ENUGWUNANKA	001	437	56	0	0	0	0	0	13	12	0	0	0	1	0	0	18	0	0	6	0	50	6	56
2	PRY. SCHOOL, ENUGWUNANKA I	002	348	51	0	0	0	0	0	13	19	1	0	0	0	0	0	13	1	0	4	0	51	0	51
3	UMUOKWUA HALL	003	341	49	1	0	1	0	0	7	14	0	0	0	0	0	0	8	0	1	7	0	39	10	49
4	AHABAOKA	004	281	54	1	0	0	0	1	11	27	0	0	0	0	0	0	7	1	0	2	0	50	4	54
5	ENUGWUNANKA VILLAGE HALL	005	1,539	113	1	0	0	0	2	23	68	0	0	0	2	0	0	14	0	0	3	0	113	0	113
6	AMAKO HALL	006	529	74	0	0	0	0	0	25	36	0	0	0	0	0	0	4	0	0	5	0	70	0	70
7	PRY. SCHOOL, ENUGWUNANKA II	007	302	42	0	0	0	0	0	3	24	0	0	0	2	0	0	9	0	0	3	0	41	1	42
8	OKPOLONAMBIA	008	326	23	1	0	1	0	0	4	13	0	0	0	1	0	0	1	0	0	1	0	22	0	22
9	UDEMBA KDT	009	486	65	5	0	1	0	0	9	30	0	0	0	1	0	0	11	0	0	7	0	64	1	65
10	EKENTAI AMAKO	010	323	50	0	0	0	0	0	19	23	0	0	0	1	0	0	5	0	0	0	0	48	2	50
11	EZENDU SQUARE	011	166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	UBAHA VILLAGE HALL	012	572	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	OKPOLI SQUARE	013	329	71	0	0	0	0	0	25	19	1	0	0	1	0	0	10	0	0	15	0	71	0	71
14	OPEN SPACE AT ENUGWU NANKA HEALTH CENTER	014	50	20	0	0	0	0	0	4	13	0	0	0	0	0	0	2	0	0	0	0	19	1	20
15	OPEN SPACE BEHIND ENUGWU NANKA HEALTH CENTER	015	56	17	2	0	0	0	0	6	3	0	0	0	0	0	0	3	0	0	0	0	14	3	17
	TOTAL	15	6,085	685	11	0	3	0	3	162	301	2	0	0	9	0	0	105	2	1	53	0	652	28	680
					A	AA	AAC	ADC	ADP	APC	APGA	APM	APP	BP	LP	NNPP	NRM	PDP	PRP	SDP	YPP	ZLP			

a	TOTAL NUMBER OF REGISTERED VOTERS /A	6,085
b	TOTAL NUMBER OF ACCREDITED VOTERS /A	685
c	TOTAL NUMBER OF VALID VOTES	652
d	TOTAL NUMBER OF REJECTED VOTES	28
e	TOTAL NUMBER OF VOTES CAST	680

Figure 7: CSRVS platform sample.

Automated Biometric Identification System (ABIS): ABIS was deployed by INEC for cleaning up of the registration of voters that took place between 2011 and 2022 before the 2023 General Elelctions. At the end of the exercise, [32] reported that 12,298,944 Nigerians successfully completed the registration as new voters. INEC further stated that:

"All along, we have repeatedly assured Nigerians that our process of cleaning up the register is robust. After a rigorous cleaning-up of the data using the Automated Biometric Identification System (ABIS), a total of 2,780,756 (22.6%) were identified as ineligible registrants and invalidated from the record, among them double/multiple registrants, underaged persons and outrightly fake registrations that fail to meet our business rules. Consequently, the number of valid registrations (post-ABIS) is 9,518,188." [33].

3.3 Summary Of Election Technologies Used By INEC From 1999 Till 2023

Table 1: Summary of technologies deployed by INEC in seven electoral cycles from 1999 to 2023.

S/N	Cycle	Voter registration	Accreditation/ voting	Result collation	Others
1	2019	* DDCM *Improved AFIS *Business rule.	*Upgraded EVR *Upgraded IVAS/SCR	*Electronic-Collation Support (e-collation) * e-TRAC	*Vehicle tracking system. *SCR whitelisting *Dedicated virtual private network *Customised SIM cards *Online voter status check
2	2023	*INEC Voter Enrolment Device (IVED) *Voter pre-registration, transfer and incident portal. *Automated Biometrics Identification System	*EVR *Bimodal Voter Accreditation System (BVAS)	Collation Support Result Verification System (CSRVS) *INEC Result Viewing Portal (IREV)	*Vehicle tracking *Offline accreditation data transmission *Online voter status check *Online nomination portal for political parties *Online portal for accreditation of local and international

		*Claims and Objection Portal *PVC collection portal			observers

The table above presents a comprehensive compilation of the technologies deployed by INEC in 2019 and 2023 General Elections. INEC used an advanced Automated Fingerprint Identification System (AFIS) for the purpose of purging the database. The business rule was also implemented in the same year that mandated the inclusion of any voter in the computerised register if a minimum of two fingers were captured as the condition. In the year 2023, the implementation of the INEC Voters Enrolment Device (IVED) system was introduced for the purpose of voter registration. Simultaneously, the Automated Biometric Identification System (ABIS) was employed to facilitate the identification and removal of duplicate registrations from the voter register. This made use of both fingerprints and facial which was different from 2015 and 2019 which used only fingerprints for the removal of double registration.

Despite the partial implementation of technological solutions for the collation of election results by INEC, the introduction of the e-collation support platform and the INEC Result Viewing (IReV) have enhanced the credibility and transparency of INEC's operations. The results were collated manually. The accuracy of the results is verified through the use of CSRVS. Subsequently, a scanned copy of the results is transmitted to IReV for public access. The CSRVS system performs the automated aggregation of votes, so serving as a mechanism to ensure checks and balances in the manual collation process. The transmission of results in real-time to IReV has significantly decreased the occurrence of manipulations at collation centres.

4. CHALLENGES AND RECOMMENDATION

4.1 Challenges Identified in Technology Deployment in Nigeria Election

The integration of ICT into electoral processes has revolutionised the management and credibility of elections. However, various challenges have been identified in the implementation, including issues such as the failure of the BVAS to authenticate elderly people. Notably, a key figure in a political party encountered accreditation difficulties during the election, despite multiple attempts [34]. Another significant concern was the BVAS's inability to differentiate between identical twins, as reported in Adamawa State, Nigeria, by [35]. In this case, one twin was erroneously deemed accredited, resulting in only one of them being granted the opportunity to vote. Additionally, some registered voters without a Permanent Voter Card (PVC) were denied the chance to vote on Election Day, despite their names appearing on both the physical register and the BVAS. Furthermore, challenges were encountered with the IReV Portal due to low bandwidth, impeding public access on Election Day. To mitigate the issue, INEC had to disable the registration and login features for viewing election results. Technical glitches were also reported on the IReV, hindering personnel from uploading scanned results on Election Day [36-37]. Moreover, inadequate training of ad hoc staff proved problematic, with some personnel confessing to their first-time interaction with BVAS on Election Day. This lack of familiarity led to dependence on BVAS operators by the Registration Area Technical Support Staff (RATECHSS), jeopardising the smooth conduct of the election. Additionally, internet network problems, including malfunctioning SIM cards in the BVAS and local network disparities, forced ad-hoc staff to resort to personal phones for internet connectivity. This resulted in unintended uploads, such as personal photos and unrelated files, on the IReV platform, compromising the integrity of election results.

Other Challenges include:

Digital resource access differs between urban and rural populations and socioeconomic classes. Digital gadgets are not evenly distributed among citizens, making technology-based voting processes difficult to engage in. Nigeria, like many other nations, is vulnerable to cyberattacks, data breaches, and misinformation operations. Voter education initiatives that explain the procedure are also needed to successfully integrate new technology. Illiteracy, computer literacy, and language barriers may hinder these endeavours. The misuse of technology for political goals, such as spreading fake news, can also damage electoral processes. Trust concerns may also be a problem. Citizens may be wary of technology due to concerns about transparency, data privacy, and manipulation. Trust in technology-driven political processes is crucial. Technical issues, software bugs, and system failures can interrupt voting and damage trust in technology.

Implementing and maintaining technology systems in a large, diverse country like Nigeria can be difficult. To successfully regulate electoral technology use, broad and inclusive legislative and regulatory structures are needed. The complexity of meeting these standards is notable. Insufficient Training: electoral officials, poll workers, and residents must be trained to use electoral technology. Bad training can cause errors and operational issues. The vulnerability of electronic systems to hacking and voting lists to manipulation remain concerns despite technical advances. One issue is cultural and linguistic diversity. Nigeria has significant cultural and linguistic variety. Modifying technology to accommodate diversity can be tough. Transparency and accountability in election technology can be difficult when the underlying processes and code are not publicly reviewed.

4.2 Recommendations for Future Elections

4.2.1 Voters Validation exercise before general elections

Before general elections, every voter who wishes to vote should be validated at least six months before the election. Individual voters can do this online or at designated locations. This would ensure that the current picture of the voter is captured, preventing occurrences of face authentication failure of elderly people. It might also be used to prevent the names of deceased people from appearing on the voter register.

4.2.2 Online certification and short and long term courses for Staff

To provide online training and certification for Ad-hock personnel, INEC should partner with platforms like Cousrea, Allison, or EDX. Certified personnel should automatically become adhock personnel in future elections. Instead of 5 BVAS for 40 students, more should be used for training. Registration Area Technical Support workers (RATECHSS) should be taught first and then deployed to help adhock workers learn BVAS for general elections.

4.2.3 Short-Term Training

Short-term training for INEC personnel with a qualified institution offering certificates for staff conversion. Staff could be promoted to administrative or executive positions by completing INEC-approved short or long-term training instead of taking unrelated courses.

Replacement of PVC with any nationally recognized identification:

Given the expense, time, and energy involved in the printing, reprinting, and distribution of PVC, national identification cards such as drivers' licenses and National Identity Number (NIN) cards can serve as a substitute. This would prevent the possibility of registering properly and being unable to vote because the voter was unable to get his PVC before Election Day or because the card was lost shortly before the election and replacements could not be processed.

Increased bandwidth and alternative internet service:

The bandwidth of the IReV portal should be increased for future elections to accommodate the large number of persons who may seek to access or upload results to the site on Election Day. Starlink internet service can be offered in locations where the internet network is extremely poor. Because it is handy and because it is the world's first and largest satellite constellation that uses a low Earth orbit to transmit broadband internet capable of supporting streaming, online gaming, video calls, and more.

4.2.4 Incease in Trust Level of INEC

The Independent National Electoral Commission (INEC) of Nigeria ought to place a greater emphasis on fostering trust among the general population of Nigeria due to the significance of trust, which is a prerequisite for the incorporation and use of emerging technologies [38]. INEC should ensue transparency in all of its activities.

4.2.5 Other Recommendations

Given eroding confidence in electoral procedures, the EMB must be honest regarding election technology, code, and procurement introduction, testing, and use. They must also create and install third-party technological solutions and quickly provide reliable data in a dispute. This requires clear intellectual property ownership or licencing and procurement, technological code, and system modification transparency [39]. Democracy must guide electoral technology. Technology innovations may work best when solving challenges. Election cycles should reflect interests. Problems and user research should inform digital solutions. Once the problem is identified, existing and proposed solutions must be reviewed to ensure free, fair, and democratic elections. Share such assessments widely [5]. Election observers should be aware of electoral technology and establish observation methods that account for it since observer reports may be used as evidence [39]. All options should be considered for constitutionality. Experience demonstrates digital solutions aren't always best. Their pros and downsides must be assessed. Some benefits influence election administration, others voters or the system. Faster results, fewer errors, real-time communication, and duplicate entry detection can improve election administration with digital technologies. Explain cost-effectiveness and efficiency. Countries evaluate advantages differently. In fiercely disputed elections, mobile technology that speeds up election results might lessen tension, but in less conflict-ridden countries, it is less relevant [5]. Voters shall have the right to view their personal data, seek its erasure from EMB database if consent is withdrawn, the data is no longer needed, or the processing is unlawful, and update incorrect, inaccurate, or incomplete data, as in Europe. People should be entitled to object to "legitimate interest" or "public interest" data processing, like political party election lists. [40]. [41] explains electoral system design factors. The following are: Voting is restricted to qualified voters. Generality—All eligible voters can vote. Uniformity—Each voter is treated equally and often gets one vote. All voters can exercise their option. The election result was calculated correctly from votes cast. Our voting systems are accessible, useful, and available to all voters, including those with impairments.

Finally, usability and accessibility determine technological acceptance. Voters should be able to use future technology.

5. CONCLUSION

The integration of Information and Communication Technology (ICT) into the electoral system of Nigeria has significantly modernised the system and enhanced election management within the nation. The findings indicate that the implementation of EVR, AFIS, ABIS, DDCM, and IVED has significantly decreased the occurrence of multiple registrations to a minimal extent. The implementation of SCR (Smart Card Reader) and BVAS (Bimodal Voter Accreditation System) for voter accreditations on election day has significantly mitigated instances of multiple voting. Additionally, the adoption of e collation support and assistant platforms such as eTRAC, CSRVS, and IReV has effectively reduced occurrences of manipulations at collation centres, as real-time transmission of results to the public ensures transparency and accountability.

Although the adoption of technologies in Nigeria electoral processes is often accompanied by several challenges which include: inability to differentiate identical twins, inability to authenticate faces and finger prints of some elderly people and the effect high temperature and low bandwidth. Nevertheless, the drawbacks associated with the adoption of technologies cannot surpass the inherent benefits. The enhancement of technological deployment in electoral processes by INEC can be achieved by the provision of comprehensive training programmes to election officials and volunteers. This training would serve to ensure the seamless operation of technology during elections. It is of utmost importance to consistently collect feedback from stakeholders and citizens in order to discover areas for enhancement and iteratively refine technological solutions. The integration of technology in the electoral process holds significant potential for improvement, although it is imperative to maintain a delicate equilibrium between innovation, security, and inclusion. In order to uphold the integrity of the democratic process, it is imperative that any novel technology undergoes comprehensive testing and is introduced in a methodical manner.

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