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The Challenges of Acquisition and Deployment of Technologies in the Conduct of Elections in Nigeria

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Abstract **– This paper sets out to examine the acquisition and application of technology in the conduct of elections in Nigeria. It further analyzed the challenges and problems arising from this technological innovation and a way out.**

The study employed both primary and secondary sources to elicit data from respondents which include the electoral officers, the electorates and party leaders randomly selected. The data garnered were analyzed using the descriptive and inferential statistics.

The findings revealed that the acquisition and use of technological instrument can enhance election result credibility and popular acceptance. For example, 96.3% of respondents from Oyo, Ekiti and Osun States of INEC were of the view that modern technology contributes to the credibility of election results. However, the findings revealed that although the application of relevant technology enhances credibility of the election, but there are challenges and problems associated with its application such as network problem, inadequate training, poor data base system, inadequate field test, insufficient skills to handle the system, environmental challenges such as hot weather, cultural issues, non-acceptability of the technology, system crash, electricity problem and a host of others.

The paper concluded that technology is a major device, capable of assisting the commission to achieve its vision and mission. However these technologies are not without their numerous difficulties in the process of acquisition and deployment. To guarantee effective result, efforts should be made to resolve most of the challenges.

Keywords **– Acquisition, Conduct of Election and Electoral System, Deployment, Independent National Electoral Commission, Technology.**

I. INTRODUCTION

E-government concerns democratic decision making using technologies such as e-voting, e-collation, e-transmission to enhance legitimacy of the state and its relationship with the citizens guided by the rule of law [1]. The quality of governance has been enhanced over the years because of many factors, among which revolution in ICTs is key. Several other democracies have since harnessed the Information and Communication Technology platform in the electoral process.

Technologies such as Smart Card Reader (SCR), voting machines, e-collation devices and many others have been used in most developed and developing countries such as USA, Japan, Estonia, Brazil, India, Germany among others to conduct elections. As at today, thirty-one countries all over the world are using various technologies to conduct election. However, countries such as Kenya, USA experienced what is called "technology crash" in the course of using technology. The policy on ICT for good governance and elections in Nigeria, as enunciated by the Federal Ministry of Science and Technology is for the country to become a technology driven society, where ICT and other technologies are utilized for improving the credibility of elections, deepening democracy and ensuring good governance.

Similarly, the present Election Management Body in Nigeria, Independent National Electoral Commission has a policy of using ICTs to promote the credibility of elections in the country. This is evidenced in the various efforts of the past and present Election Management Bodies to utilize ICTs for the conduct of elections. The vision of INEC is to be one of the best election management bodies in the world, while its mission is to serve as an independent and effective election management body committed to the conduct of free, fair and credible elections for sustainable development of democracy in the country. Technologies can undoubtedly play a major role in the translation of the vision and mission of the commission into a reality.

The introduction of ICT into the conduct of elections is generating both interest and concern among voters, as well as practitioners across the globe. Today, most Electoral Management Bodies (EMBs) around the world, Nigeria inclusive, use new technologies with the aim of improving the electoral process. These technologies range from the simplest one such as word processing to a more sophisticated one such as optical scanning and Geographic Information System to mention but few. It is a fact that technologies simplify the process involved in the conduct of election such as counting, tabulation, collation and so on, it is however pertinent to note that these technologies are not absolute in term of solving major problems concerning elections. It is in this regard that emphasis is laid on the mindset of stakeholders in the application of these technologies, as experiences abound around the world. In Nigeria for example, despite all efforts made by the outgone Election Management Body (Jega's Administration) to simplify the conduct of elections through innovative technologies, some people were out to frustrate that effort as shown in the violent destruction of card readers. These card readers were meant for accreditation during the 2015 general elections and the bye elections recently conducted in Rivers, Kogi and other states where re-run/bye-elections took place.

Finally, a critical look at the literature review on technology and electoral process reveals that a lot has been done on the impact of technologies on electoral process with little emphasis on challenges involved. It is this lacuna that inspires this paper to have a cursory look at the challenges of these technologies.

A. Objectives of the study

To this end, the objectives of the paper are to:

(a) identify the various technologies deployed by the Independent National Electoral Commission since the commencement of digitalization of electoral process in 2002;
(b) assess their effectiveness in the conduct of elections in Nigeria; and
(c) examine the major challenges of these technologies.

II. Literature Review

In order to flashback to what has happened in other part of the world and Nigeria's elections, we intend to review briefly literature in order to identify weaknesses, effects, challenges and prospects of ICTs which this paper intends to fill.

A. Democratization Process, Conduct of Elections and Technology

Democracy is a popular concept in social sciences and like other social sciences concepts, defies a universally accepted definition. However, the word democracy as captured in scholarly expressions comes from the Greek word demokratia and literally means "rule of the people"[2]. It also comes from the Greek demos "people" and "rule"[3]. Reference [4] believe that democratic government originated from the Greek City States, where democratic values or ideals started and were transferred to other societies. However, it is an established fact that the Greek's perception of democracy is not in consonance with the modern day perception of the concept of democracy. The later narrows democracy to a small group of people participating in democracy while the modern day democracy consider majority rule and representative government as the major ingredients of the concept.

This concept of modern day democracy came into use during the course of 19th century to mean a system of government in which people are elected into offices through a competitive means. The modern day democracy was instituted in Britain and America and it is this view of democracy that Nigeria is assumed to be involved till today. Consequently, this type of democracy has basic elements, they include: periodic elections, guarantee of fundamental human rights; existence of alternative choice of parties and candidates during election of representatives by majority vote; adherence to the rule of law and separation of power [2]. In view of the above expositions, the concept of modern day democracy connotes that election into offices must be free, fair and credible. Any act that do not guarantee this, amounts to electoral fraud or malpractice, and such must be condemned by a civilized society. Consequently, Technology is a major tool to achieve this standard.

Democratization process on the other hand means legal procedure or laid down rules and regulations that a nation wishing to practice democracy should abide with. Most of these rules and regulations are embedded in the Constitution, Electoral Act and guidelines. Of great concern to us is whether these procedures are followed in the conduct of elections in the country, certainly no.

Historically, the credibility of elections in Nigeria since the colonial era has been a subject of controversy. Beginning with 1959 election, a lot of systematic riggings were observed [5]. In 1979 for example, the issue of 2/3s crisis became a major issue, while the registration of voters' was accompanied by a lot of questionable figures.

Reference [6] categorized the 1983 election as being the worst in Nigeria. The election according to him witnessed all forms of strategies and stratagems in a frantic attempt of the opposition parties to retain power or improve its performance vis-à-vis other parties. Federal influence were deployed to rig out the governors of Anambra, Bornu, Oyo, Kaduna and Gongola States by the ruling NPN. Reference [7] also corroborated the above by asserting that "the 1983 elections occupy a special place in the history of electoral fraud in Nigeria". Competitive rigging reached its highest level. Reference [8] also described the 1999 election as being fraught with irregularities. Such irregularities includes: falsification of results, intimidation of opposition party at polling units, disenfranchisement of qualified voters, abuse of incumbency powers, bribery of voters and electoral officials, ballot stuffing, snatching of the electoral materials among other electoral misdemeanors. The 2003 and 2007 elections were not left out of the fraudulent activities of some stakeholders in the electoral process. It is against these backgrounds that the commission under the headship of Dr. Abel Guobadia (now late) commissioned the digitalization of voters register in 2002. The exercise was followed by the introduction of Direct Data Capture Machine (DDCM) and Smart Card reader by the out gone Jega administration.

Also, it is important to note that the heads of various election management bodies in the country made several attempts to guarantee free and fair elections. Part of the efforts was to introduce some technologies that could minimize fraud in election. Unfortunately, some of these technologies were not without challenges.

III. Methodology

In an effort to search for challenges of acquisition and employment of technologies in conducting elections in Nigeria, the author relied on both primary and secondary data sources. Primary data were collected through the use of questionnaire administered on thirty (30) officers purposively selected for the study in Oyo, Osun and Ekiti States. A focus group discussion was also carried out on selected personnel of ICT department of the commission in the selected states. Secondary data were sourced from annual reports on electoral activities, the Constitution of the Federal Republic of Nigeria (1999), the Electoral Act 2010 as amended, judgment from courts and other relevant documents.

IV. Conceptual Definition of Terms

The following terms were defined for the purpose of this paper.

A. *Technology*

Reference [9] categorized technology as a special resource, an important strategy for the exploration of the national resources, and an agent of social and economic change.

Technology is defined as the practice, the way we do things around here. Similarly, the term 'technology' is mostly used in three different contexts, when referring to a tool (or machine); a technique; the cultural force; or a combination of the three. Technology can be most broadly defined as the entities, both material and immaterial, created by the application of mental and physical efforts in order to achieve some values. In this usage, technology refers to tools and machine that may be used to solve real world problems. It is a far reaching term that may include simple tools, such as a crowbar or wooden spoon, or more complex machine, such as space station or particles accelerator. Tools and machines need not be materials. Virtual technology, such as computer software fall under this definition of technology. The word "technology" can also be used to refer to a collection of techniques. In this context, it is the current state of humanity's knowledge of how to combine resources to produce desired products, to solve problems, fulfill needs or satisfy wants. It includes technical methods, skills, processes, techniques, tools and raw materials. Technology is a broad based concept that deals with a human usage and knowledge of tools and crafts, and how it affects a human ability to control and adapt to his or her environment.

Reference [11] defined technology as what enables human being to extend their capabilities and accomplish tasks that they could not perform otherwise. In his own view, [12] is more specific about the nature of these tasks by defining technology as knowledge combined with appropriate means to transform materials, carriers of energy or other type of information from less desirable to more desirable form. Technology can also refer to objects of use to humanity, such as machines, hardware or utensils, but can also encompass broader themes, including systems, methods or organization, and techniques. Webster dictionary offered a definition of the term as "the practical application of knowledge in a particular area" and "a capability given by the practical application of knowledge".

Reference [13] described technology as systematic knowledge for the manufacture of a product, for the application of a process or for rendering of a service, including any integrated, associated, managerial and marketing techniques. Technology within the context of this paper means tools, machine, process, techniques, software and hardware, that can enhance elections credibility and acceptability.

B. *Acquisition of Technologies*

Acquisition of technology and knowledge involves the purchase of external knowledge and technology with or without active cooperation with the source.

a. Reasons for Acquisition

The most obvious reason for acquisition of technology include better efficiency or effectiveness. The importance of morale or the desire to make offices feel better, needed or wanted is another reason for technology acquisition – global innovation and technology alliance. There may even be political motivation behind the introduction of new technologies. Within the context of this paper, technological acquisition is borne out of the need to improve the conduct of election by simplifying accreditation, counting of results, voting and collation as well as accreditation and voting. The introduction of new technologies will in no small amount improve on the integrity of the conduct of elections. It is important at this juncture to identify technologies deployed in INEC since inception.

V. Deployment of Technology In INEC

A. *Identification of Technologies Deployed till 2015 General Elections*

ICT has been described as a necessary tool that is capable of enhancing the credibility of electoral process. The quality of governance has been enhanced over the years as a result of many factors, among which is the use of ICT in the electoral process. The nasty experiences of the electoral bodies in Nigeria for the past four or five decades concerning the credibility of elections were one of the reasons that necessitated the advocacy for application of Technologies in the management of electoral process. The incessant hijack of ballot papers and manipulation of result sheets by hoodlum in some of the elections conducted before 2011 were part of the reasons responsible for the deployment of technologies in the recent time for the conduct of elections in Nigeria.

B. *Paper Ballot*

Paper ballot elections present logistical and administrative challenges, culminating in difficulty in scaling, repetitions with increasing cost, slow in tabulation, subject to ballot misinterpretation and miscounts, introduces possible coercion and vote buying. It has been unequivocally asserted that every form of paper ballot that has been devised could be and has been manipulated with considerable ease.

Historically, deployment of automated technology in the conduct of elections by the EMBs in Nigeria started in 2002. The technology can be categorized into two;

(i) Technologies for voters' registration
(ii) Technologies for voting and collation

a. Technologies for Voters Registration

Prior to 2002, the manual method of compiling voters list was the order of the day. Faced with critical challenges of possible manipulations, such as under-aged and duplicate registrations, the commission decided to introduce technologies such as Optical Mark Recognition (OMR) to compile voters list, so as to add to the credibility of elections. However, the OMR technology which has the characteristics as scanning, conversion into digital formats and stored in the data base became obsolete with the arrival of a more sophisticated technology called Direct Data Capture Machine (DDCM).

The DDCM which has components such as laptop, camera, printer, USB Hub and scanner was introduced to compute names of eligible voters in 2006 and used in 2010 and 2014 for Continuous Voters Registration (CVR). This technology brought a remarkable improvement to the

conduct of elections in 2007 and 2011, though faced with numerous challenges which will be highlighted in the course of this paper. The technology also produced permanent cards for voters.

C. *Technologies for Voting*

Activities involved in voting can be split into: accreditation, balloting, collation, transmission and declaration of results.

Accreditation

The process of accreditation since the inception of electoral body in Nigeria was manual. However, accreditation of voters got improved with the introduction of Smart Card Readers (SCR) in 2015 elections.

The Smart Card Reader is a technological device, set up to authenticate and verify the permanent voters' card (PVC) issued by INEC. The device uses a cryptographic technology that has ultra-low power consumption with a single core frequency of 1.2GHz and an Android 4.22 Operating System. In other word, card reader is designed to read information contained in the embedded chip of the permanent voters card, and also carry out a verification of the intending voters by matching the biometric of the voters with the ones stored on the PVC Engineering Network Team (2015). The card reader also:

(1) compares the face of the card holder with the image displayed on the SCR when the PVC is read;
(2) determines whether the PVC is original; and
(3) compares the fingerprint stored on the card with what was physically presented and scanned by the SCR.

Once the PVC has been read and accredited by the SCR, the Voters Identification Number (VIN) is stored in the reader and it does not allow accreditation of that VIN on that particular reader any longer. The use of the PVC and SCR gave a lot of credibility to the 2015 general elections, but for the Supreme Court judgment in 2016 which undermined the use of SCR for accreditation of 2015 elections.

D. *Technologies for Balloting*

The use of Electronic voting is prohibited by section 52(1)(b) of the Electoral Act, 2010 as amended. However, electronic collation has been tested in various bye-elections and proved effective (INEC, 2015). It is a robust and well secured platform that collect data from the polling units and collate the results up to the required level for any election. The system was used in Kogi, Bayelsa and River State Governorship elections.

E. *Technologies of e-collation, e-trac, EOSC, ERMT*

Apart from technologies of accreditation and registration of voters, the commission also came out with some innovative technologies such as e-trac, e-collation, ERMT (Electoral Risk Management Tool), EOSC (Electoral Operation Support Centre). The e-trac system is a platform by ICT to monitor results from polling units to the final collation centre, by scanning the results to the constituency level. The major challenge is Network problem. Similarly, the Election Risk Management Tool is charged with the responsibility of surveying electoral wards and units with a view to identifying flash point areas. The tool is intended to build users' capacity to understand electoral risk factors, collect and analyse data, design prevention and mitigation strategies; and record results of the elections. The major challenges are funding and manpower. Furthermore, the commission also came up with concept of Election Operation Support Centre which is charged with the responsibility of monitoring distribution of materials as well as the logistics, security arrangement starting from the eve of the election to the time of declaration of results. The major challenges are network problem and unwillingness by some officials to disclose information in some cases. Finally, e-collation is a technology introduced by INEC, purposely to collate results from Ward to Local Government Areas and constituency levels. The results are collated polling unit by polling unit. Having identified some of these technologies, it is pertinent to consider the management of technologies for electoral administration.

VI. Managing Technologies for Electoral Administration

Reference [15] asserted that technology is among an organization's most important resources. Hence, it needs to be properly managed to avoid disappointment and meet the organizational goals. Consequently, the Administration of Cost and Election (ACE) suggested the following steps in managing technology for electoral administration:

i. Conduct detailed needs assessment studies to identify the required environment, regulations, procedures and tasks;
ii. Prepare a business plan with a cost estimate and a benefit/risk analysis;
iii. Secure the financing necessary to acquire and maintain the chosen technology;
iv. Obtain adequate staff with technical experts;
v. Secure transportation, warehousing and distribution of equipment, if applicable;
vi. Ensure adequate testing procedures before any technology is adopted;
vii. Implement proper security procedures;
viii. Create a training plan for staff and user training;
ix. Ensure proper maintenance and backup procedure are in place;
x. Give users access to a help desk; and
xi. Prepare adequate replacement plans and procedure for equipment that will become obsolete.

A. *Maintenance of the Technologies*

Reference [5] observed that determining the correct maintenance approach for various assets can help optimize the life span of an asset. There are various types of maintenance strategies such as preventive, corrective/breakdown, predictive, reliability centre and total productive maintenance strategies. Preventive strategy which is defined by [16] as the schedule of planned maintenance action aimed at the prevention of breakdown and failures of assets. The ideal maintenance programme would prevent all major system failures before they occur. It involves detailed planned maintenance activities on a periodic basis, usually monthly, quarterly, semi-annually or annually. Corrective/Breakdown Maintenance Strategy refers to all actions that are required to restore a defective

system to working condition [16]. These actions include replacement and repair of equipment. Similarly, [5] noted that predictive maintenance and condition-based maintenance are synonyms. A condition based maintenance programme evaluates machinery via instrumentation, either periodically or continuously, to determine its condition, usually through a condition monitoring (CM) programme. Preventive, corrective/breakdown and predictive maintenance strategies could be adopted by INEC. This and other maintenance strategies could be very useful for avoiding complete breakdown of the already acquired technologies for electoral activities in the country.

B. *Addressing Security Issues with Technology for Electoral Activities*

Though the Commission has not embarked on e-voting system, however, some of the already deployed technologies such as e-trac, e-collation are vulnerable to security issues. Consequently, [17] identified major threats that can befall electoral technology and suggested the way out. To avoid or minimize complete loss of data, hacking and other possible dangers in the process of applying the technology, the ACE Electoral Knowledge Network suggested the following:

(i) Physical restrictions to building where data and systems are installed;
(ii) Encouraging employees to sign on with user identity and password which are known to them personally and should be changed frequently;
(iii) Putting a restriction to time and location at which terminals can be used;
(iv) Special software can be installed on a computer system, which will maintain audit trail of who has logged on, from which terminal and for how long. This will enable any unusual activity to be spotted and investigations made;
(v) Data can be encrypted before being transmitted to make it unreadable. It is then decrypted at the recurring end;
(vi) Constant training of staff to ensure efficiency in the usage of the system;
(vii) Careful vetting of staff to ensure that potential hackers and fraudsters are not employed; and
(viii) Installing virus checkers on all networks.

Having identified the measures to take in the management of technologies, we now discuss the various challenges that may confront these technologies.

VII. Challenges of Technologies Deployed Since Independence

It has been established that technologies have played effective role in the electoral processes in developed countries, however, these technologies were not deployed without difficulties ranging from socio-economic, political and cultural hiccups in Nigeria and other developing countries. Reference [18] reported that differences in the contextual environment, socio-economic and political antecedents could be responsible for the differences in the effectiveness of the application of technologies in various countries. Below are the major challenges of these technologies in Nigeria.

A. *Challenges of Paper Ballot*

The use of paper ballot as a technology in the conduct of election in Nigeria poses some challenges. One of these challenges is the difficult topographical terrain of some communities [19].This makes effective distribution of electoral materials very difficult. The Nigerians living abroad are not able to exercise their voting right. The security and poll officials posted to polling units usually find it extremely difficult, if not impossible, to vote during elections [20]. Under the ballot paper system, electoral officials collate, count, and announce election results manually. Hence, the method is prone to human error and deliberate manipulation by electoral officials with corrupt motives and intention to rig the election. These circumstances among others, inspired the exploration of robust election methods through the use of ICT [21].

B. *Challenges of Newly Acquired Technologies*

Beginning with the registration of voters, the experience of INEC officials was not palatable. Constant breakdown and insufficient of Direct Data Capture Machine, (DDCM) to cope with the large number of registrants in some polling units, inability of scanners to read biometrics, insufficient consumables such as A4 paper, cold laminate, unfaithfulness on the part of ad hoc staff engaging in multiple registration and uncooperative attitudes of politicians, were some of the major technical challenges encountered by the INEC during the e-registration in 2006 and 2010. However, some of these challenges were taken care of in 2014/2015. The Commission under the administration of Professor Jega ensured adequate supply of DDCM during voters registration. But the printing of PVCs was a serious problem as some wards and polling units could not have their PVCs printed before the conduct of the 2015 general elections.

The use of Smart Card Reader was another innovative technology introduced in 2015 General Elections. The card reader was designed to speed up and ensure integrity in accreditation process. The smart card reader is a technologically device set up to authenticate and verify the permanent voters' card (PVC) issued by INEC, against the cloned one.

During the election, some of the card readers could not function well due to poor handling by ad hoc staff, inadequate training and insufficient number of technical staff. Also, the level of awareness programme in the use of card readers among the voters was not sufficient. Technical staff were expected to be in each ward or Registration Areas to attend to problems. This was not the case in all the wards because they were not sufficient in number. However, card readers were proved to be more than 50% successful in fifteen states during the 2015 elections. It should be noted that the rate of failure of the smart card reader was heavier in the North than in the South. This could be as a result of social and environmental factors.

Below are the results of success/failure rate of SCR during Mock Election and Governorship and House of Assembly elections in 2015 respectively.

Table I: Testing of Smart Card Reader – Draft Table of Report of Mock Elections Conducted on March 10th, 2015

S/N	State	% Success	% Failure
1.	Anambra	70.3	29.7
2.	Bauchi	59.5	40.5
3.	Delta	92.0	8.0
4.	Ebonyi	34	66
5.	Ekiti	67.4	32.6
6.	Kano	47.4	52.6
7.	Lagos	91.4	8.6
8.	Nasarawa	35.7	64.3
9.	Niger	35.7	64.3
10.	Rivers	31.6	68.4
11.	Taraba	38.6	61.4
12.	Kebi	54.3	55.7

Source: Vanguard, 15th March, 2015

Table II: Analysis of Functionality of Smart Card Readers in Governorship and State House of Assembly Elections in 2015

S/N	State	% Success	% Fail
1.	Ekiti	50.0	50.0
2.	Anambra	51.5	48.5
3.	Rivers	52.9	47.1
4.	Adamawa	54.0	46.0
5.	Benue	54.2	45.8
6.	Cross River	54.8	45.2
7.	Delta	56.0	44.0
8.	Kogi	59.4	40.6
9.	Ogun	59.4	40.6
10.	Ondo	59.7	40.3
11.	Abia	61.0	39.0
12.	Osun	63.7	36.3
13.	Edo	64.6	35.4
14.	Oyo	64.7	35.3
15.	Lagos	78.9	21.1
16.	Kano	15.9	84.1
17.	Nasarawa	17.9	82.1
18.	Bayelsa	21.2	78.8
19.	Sokoto	21.9	78.1
20.	Taraba	22.0	78.0
21.	Zamfara	22.5	77.5
22.	Borno	24.1	75.9
23.	Kastina	27.3	72.7
24.	Yobe	27.4	72.6
25.	Kwara	29.6	70.4
26.	Jigawa	31.6	68.4
27.	Kebbi	31.7	68.3
28.	Akwaibom	33.9	66.1
29.	Bauchi	36.6	63.4
30.	Imo	38.9	61.1

Source: INEC, 2015

Presentation of fake permanent voters' cards, was another constraint that did not allow the smooth working of the technology in some states. This became a serious challenge for the electoral officials. Also, the inadequate training of personnel preparatory to the use of smart card reader, culminated into poor handling of the machine by electoral officials. Cases of broken antenna, misplacement of battery and deliberate removal of Security Access Module (SAM) Card were many across the country. All these reduced the success rate of the technology.

New technology also needs a colossal sum of money. Purchase of equipment such as DDCM, Smart Card Readers is capital intensive. Acquisition of software is also expensive most especially when it is not developed by the commission. Most of the DDCM used during the 2010 registration exercise should have been replaced by now because some of them are obsolete. As a matter of fact, the commission ought to have procured another set of DDCM for the proposed continuous voters registration exercise across the country.

C. *Test Running of the Proposed Technology*

One of the major problems that confronted the application of most technologies adopted so far by the Commission is its inability to do "proper" test run of the technology. For example, the use of card readers ought to have been tested in some bye/re-run elections before the general elections. This measure if carried out effectively would have enabled the Commission to evaluate the appropriateness or otherwise of the technology. Similarly, it should be noted that technology in the conduct of election is not an end but a means to an end, therefore, the political, socio-economic environment under which a new technology is applied will determine to what extent such technology will succeed.

D. *Inadequate Awareness of the New Technology*

Stakeholders within the context of innovative technology in electoral process include but not limited to politicians, electorates, civil society organizations among others. In managing technology for electoral administration, there are three conceptual frameworks involved: Technical Feasibility, Economic Variability and Social Acceptability. The social acceptability is very germane so as not to impose what is not socially acceptable on the electorate. Reference [22] reported that majority of the electorates in Nigeria preferred INEC to use more technologies in the conduct of elections in Nigeria. It is hereby suggested that, the proposed electronic-voting machine to be introduced in future should not only be assessed in line with the socio-political and economic environment in which we find ourselves, the acceptability of such technology by various stakeholders should be enhanced by way of enlightening them on the implications of using the technology.

E. *Appraisal of the Institutional Framework*

ICT department in INEC procures, deploys and maintain the technologies in existence for elections. From records, it is believed that ICT departments are well equipped at the headquarters and state levels, but such has not been extended to the Local Government. The success or otherwise of ICT application in electoral process would to a large extent depend on availability of ICT department and tools at the Local Government level. This is because elections take place at the Local Government Areas via polling units. These infrastructures are presently lacking at the LGAs.

F. *Uncooperative Attitudes of Political Class*

It is a popular adage that the only thing that is permanent is "change". But it seems the political class in Nigeria do not want to accept this as a necessary phenomenon in the re-organization of things. The digitalization of voters' registration in 2010 and subsequent continuous voters registration were nearly frustrated by unscrupulous set of people who were mostly political thugs. Cases of double registration by moving from one place to the other, using special registration options meant for people who were physically challenged were abound. Similarly, Smart Card Readers were deliberately made not to function by these set of people who were not favourably disposed to change.

G. *Socio-Cultural and Religion Contexts*

Nigeria is a multiethnic country comprising of about Two Hundred and Fifty (250) ethnic groups (The World Factbook). As a result of cultural background, and religious tenets, some sections of the country found it difficult to surrender themselves to biometrics or photograph taking. Special arrangements had to be made by the commission in ensuring that such people were not prevented from registering as voters and disenfranchised during elections. These and other cultural or religious beliefs made it difficult for the Commission to deploy some of its technologies effectively.

H. *Breach of Intellectual Property Law*

It is a trite in law that who so ever ought to enjoy the right of another person in intellectual property must seek permission to do so, otherwise this may result to infringement on such rights. The commission is not the owner of most if not all the technologies in question. Permission to transfer the technology (software and hardware) must be sought to avoid litigation. For example, in 2014, a Federal High Court in Abuja ordered INEC to pay Bedding Holdings Ltd, a sum of seventeen (17) billion naira for the use of its patent right on collapsible transparent boxes without approval. Also, the Commission was sued for using Direct Data Capture Machine belonging to Zinox, and Avante Technologies Development Ltd (Daily Tide 29th January, 2014).

I. *Legal Barrier*

The Electoral Act, 2010 does not provide for the use of Smart Card Reader, neither does it provide for the use of electronic voting machine (Section 52(1)(b) Electoral Act, 2010), as amended. There has been a lot of legal debates and controversies as to whether the existing laws governing the conduct of election recognize the use of card reader. Some are of the opinion that smart card reader is provided for in the 2015 manual guideline for elections and since this is part of the legal instruments used in the conduct of 2015 general elections, then the Commission has not violated any law regarding the use of SCR. The proponent of SCR argued that INEC under Section 160 of the 1999 Constitution (as amended) is empowered to make its own regulations as the situation demands. Therefore, INEC's decision to use SCR was in order. However, in the case of *INEC v. Nyesom Wike* (2016) All FWLR pt. 836, the Supreme Court ruled that "the extant laws of the Federation provides for the use of voters register, but the card reader irrespective of its importance does not have a place in any extant law of the land. The Supreme Court commended INEC for introducing card reader, but affirmed that the Trial Tribunal and the Lower Appeal Court were wrongly swayed by the INEC guideline. Therefore, validation for voting process through the use of voters register takes precedence over any other process for now. It should be recalled that Section 9(1) of the Electoral Act gives the commission the power to compile, maintain, and update on a continuous basis a national register of voters… which should be used to vote in any Federal, State or Local Government or Area Council elections.

Hence, despite the provision of the use of card reader in the INEC guideline under section 8(b) of approved guidelines and regulations for the conduct of 2015 general elections, which can be regarded as a subordinate law, card reader cannot be used to determine the credibility of election, because there is no express provision of such law in the Electoral Act empowering the use of SCR in the conduct of election.

Personally, in my opinion, I think the Supreme Court based its decision on the superiority of Act of National Assembly as against subordinate law, where preference is given to a superior law over subordinate law, whenever there is a conflict between the two. This is rooted in the provision of the 1999 Constitution as amended. Section 1(3) says "If any other law is inconsistent with the provision of the constitution, the constitution shall prevail, and that other law shall to the extent of inconsistence, be void". Using this argument, it will be observed that Electoral Act, 2010 as amended is superior to INEC guideline, and since the Electoral Act does not provide for the use of SCR in conducting election, it then means that the guideline is inconsistent with the provision of the Electoral Act and therefore null and void, to the extent of its inconsistency.

J. *Power Supply*

This is a major challenge as most rural areas in the country are yet to be electrified. However, this should not be a serious barrier, since the use of generator and batteries could be encouraged.

VIII. Empirical Investigation and Findings

The author of this paper administered questionnaire on thirty (30) purposively selected ICT staff of the commission in Osun, Oyo and Ekiti States. Also, a focus group discussion was carried out on randomly selected party leaders and market women. In Ekiti State for example, 90% of the respondents were of the view that the use of modern technology can assist in the conduct of elections in Nigeria. Respondents from Oyo and Osun also hold the same view. Furthermore, about 94.5% of respondents from the above named states identified technologies such as OMR, Direct Data Capture Machine, Smart Card Reader, computer system for electronic collation as the major technologies deployed between 2002 and 2015.

Similarly, more than 90% of respondents from the selected states were of the opinion that major challenges of the technologies include but not limited to network issues, inadequate training, inadequate field test, insufficient fund,

non-acceptability of the technologies by the electorates, lack of political will, behaviour of political thugs, failure of the system, manpower shortage, environmental hazards, cultural problems, mindset of people, poor maintenance approach, poor legal framework and a host of others. The respondents also suggested adequate training of staff, planning for upgrade, enlightenment of the electorate, award of contract to appropriate companies for the supply of systems, conducive environment for the system among others.

IX. Conclusion

The paper concluded that technology is a major instrument that could assist the election management body to achieve its vision and mission.

Furthermore, the technologies in question as good as they are, are vulnerable to certain challenges in the realm of acquisition and deployment. As confirmed in the literature review and empirical investigation, these challenges have been militating against the proper functionality of technologies

Furthermore, it is an established fact that technology is not an end, it is a means to an end. The mindset of stakeholders who are the users of the technologies play a great role in ensuring its effectiveness and efficiency. Finally, the socio-economic and political environment under which the Election Management body operates matters a lot.

X. Recommendations

In order for the commission to overcome the major challenges of acquisition and deployment of technologies for electoral activities in Nigeria, it is recommended as follows:

(i) To guarantee effective deployment of technologies, efforts should be made to educate stakeholders in the electoral process on the existing technologies and the proposed ones including e-voting technology. To this end, the use of corps members as INEC Ambassadors as inaugurated by the commission on 27th June, 2016 nationwide was highly commendable. The National Orientation Agency (NOA) could also play a better role in dissemination of ideas and issues on elections and technology.

(ii) Technology assessment presumes that new innovation should be evaluated by test running the technology in question. This should be done on a larger scale such as bye/re-run election before the general elections.

(iii) The social acceptability of the technology to be introduced is germane in technology management. Hence, the Electoral Institute which is saddled with the responsibility of carrying out research should investigate the level of social acceptability of technologies, particularly the proposed ones, so as to ensure effective deployment.

(iv) The present stock of Direct Data Capture Machine in the commission should be replaced in the interest of efficiency and effectiveness of the proposed nationwide continuous voters registration.

(v) Decentralization of the supply of consumables, will to a large extent, improve the overall result in the conduct of CVR.

(vi) Adequate training of permanent and Adhoc staff is necessary for proper handling of the equipment for registration of voters, accreditation and other technologies meant for collation and transmission of results. In fact, INEC should invest in regular staff training and development in order to be in tune with modern day technological changes that is fast occupying the democratic landscape and electoral process.

(vii) The introduction of PVC is a good technological innovation in electoral process, however, the printing of the cards should be decentralized such that each geopolitical zone should have a production centre. This will curb unnecessary delay in the printing and availability of the cards for distribution.

(viii) In order to ensure effective deployment, well-trained and enough technical staff should be engaged in each registration area during registration of voters or election. Youth Corps members could be specially trained for this job.

(ix) Technological innovation is capital intensive, the Commission should not hesitate to ask for appropriate fund from the government to execute the project. Government on its own part should release enough fund for the acquisition of the relevant equipment.

(x) Technology maintenance strategy is crucial in effective deployment of technology. Preventive, corrective/breakdown and predictive maintenance strategies are recommended for the existing and proposed technologies.

(xi) ICT department should be extended to Local Government Areas. It should be strengthened at the LGA level because electoral activities actually take place at that level. Strengthening it at this level will enable the Commission to connect LGAs with the state and Headquarters Networking.

(xii) In addition to the general enlightenment of the existing and new technologies, political class as the major stakeholders should be properly briefed whenever a new technology is to be introduced.

(xiii) Research work on the impact of new technologies is electoral process in Nigeria should be encouraged and carried out by the electoral institute. There are various gaps in knowledge to be filled on Technology and Electoral Process in Africa. Such research work is robust in developed countries.

(xiv) As part of the enlightenments, churches, mosques and community town halls should be visited by INEC officials for dissemination of information on new technologies.

(xv) Relevant legal instruments for the conduct of election should be amended to accommodate the use of technologies in election. The National Assembly should be made to do this.

(xvi) Establishment of electoral offences commission as recommended by Uwais Panel of enquiry in 2008 should be implemented. INEC has no power to arrest, detain and prosecute offenders under our laws.

(xvii) The electoral management body and democratic practitioners should start getting the contextual knowledge of new technology being proposed. This is because the processes involved are many and should not be taken for granted.

(xviii) The legal department should ensure due process is followed in the course of acquisition of any technology in future. This is to save the Commission from any legal embarrassment as witnessed in the past.

(xix) The Technologies of EOSC, e-trac, ERMT and e-collation should be well funded and manpower provided. Network providers should be informed to extend their services to rural areas.

REFERENCES

[1] D. Brown "Electronic Government and Public Administration." International Review of Administrative Sciences, Brookfeld, VT, USA.2005.

[2] Noah, Yusuf "The Democratisation process and Industrial Relations Practice" In Hassan, Saliu., Ebele, Amali., Joseph, Fayeye and Emmanuele Oriola (eds.). Democracy in Nigeria Vol. 3, Social Issues and Extended Relations. Lagos: concepts Publications Limited.

[3] O. Oche, "Democracy; conceptual and Theoretical Issue" in Saliu, H.A. (eds.) Nigeria Under Democratic Rule 1999 – 2003, Vol. 1. University Press PLC Ibadan.

[4] Birch, A.H. 'The Concepts and Theories of Modern Democracy'London: Routledge. 1993.

[5] A. Micheal. et al (2015) ICT and Electoral Management: The need for Forensic Investigation in Electoral Process in Nigeria. Paper Presented at Department of Political Science and Public Administration, Backcork University, Ilesan Remo.

[6] Kurfi "Nigerian General Elections 1959, 2003: My Roles and Reinsurance". Abuja Spectrum Books, Abuja. 2005.

[7] B. Aturu "Rigging and Electoral Fraud in Nigeria: State of the Art" In Kroeyr, K.L. (2010). "Engineering the Web" Third Decade. Association for Computing Machinery, 53(3): 16 – 18. 2000.

[8] D.S. Garta, "Transition without Charge: The 2003 Elections and Political Stability in Nigeria. In Godwin Onu and Abubakar Mowoh (eds) Elections Democratic. Consolidation in Nigeria, Lagos: A – Trend Associated. 2005.

[9] P. Drucker,. *Democracy*. London. B.T Batsford Publishers. 1970.

[11] A. Grubler,: *Technology and Global Change*. U.K. Cambridge University Press. 2004

[12] A. Borgmann,. Technology as a Cultural Force. *The Canadian Journal of Sociology*. 2006, 31(3), 351 – 360.

[13] M. Ilori,: "From Science to Technology and Innovation Management". Being an Inaugural Lecture at Obafemi Awolowo University, Ile-Ife, O.A.U. Press. 2006.

[15] D. Comer and E. Gauglas, .: *computer Networks*. U.K. Prentice Hall. 2009.

[16] M. Frazier, and G.D Bailay, .*The Technology Coordinator Handbook*. 2004 UK. Eugene Publisher.

[17] P.M Heathcote: *'A' Level Computing*. Malta. The Gultenberg Press Ltd. 2002.

[18] A. Maiye & K. McGrath,: Examining Institutional Interventions: The Case of Electronic Voters' Registration in Nigeria in A.O. Bada & P. Musa (Eds.) 2008. IFIP WG 9.4: *Towards an ICT Research Agenda for African Development 72 – 93*. Birmingham, USA: University of Alabama. Retrieve From http://researchspace.csir.co.za/dspace/bitstream/10204/2501/1/Phahlamohlaka_2008.pdf#page=72

[19] C. LeVan & P. Ukata,. Countries at the Crossroads 2012: Nigeria. Retrieved from http://www.freedomhouse.org/sites/defeault/files/Nigeria%20-%20FINAL.pdf

[20] S. Adebowale, Diaspora Voting not Feasible in 2015 – INEC. 2014. Retrieved from http://theagleonline.com.ng/diaspora-voting-feasible-2015.inec/

[21] O. M. Olaniyi, D. O. Adewunmi, E. A. Oluwatosin, O. T. Arulogun, M. A. Bashorun., "Framework for multilingual mobile e-voting service infrastructure for democratic governance. African Journal of Computing and ICT" , 4, 23-32.

[22] M. Omoleke, A Study of the Application of Technologies in the Management of Electoral Process in Nigeria. Being a Ph.D Thesis Submitted to African Institute for Science Policy and Innovation (AISPI), O.A.U., Ile-Ife. 2010.

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Dr. (Barr) Omoleke Muslim was born in Ikire, Irewole Local Government area of Osun State, Nigeria. He attended Ife City College between 1976 and 1980 where he obtained his West African School Certificate with Division One. He later proceeded to the University of Ife (now Obafemi Awolowo University, Ile – Ife) between 1981 and 1985 and came out with B.Sc Education/Economics. He also acquired the following qualifications from the same university: Master of Business Administration (MBA) in 1995, Master of Philosophy (M.Phil) in Management and Accounting in 2001 and a Doctor of Philosophy degree in Technology Management (Ph.D) in 2010.

Because of his flair for academics, Dr. Omoleke went back to read Law at the same university and got his LLB in 2002. He also read Master degree in Law (LLM) with Specialization in criminology and Penology.

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