



Analysis of Voter Registration Systems with Proposed Merged Voter Registration System for Nigeria Electoral Commission

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Abstract: Voter registration is a procedure which qualifies a citizen to vote and be voted for in any given election. It is an essential element for any credible election. From voter registration, a list of voter is generated called voter List. Voter List is a viable tool in the side of both election body and the political system. It serves as a guide in the electoral strategies. Irrespective of the great importance of the voter registration, the system has been bastardized by anxious politicians leading to a total loss of confidence in the voter registration system. This study critically examines voter registration systems, the feasibility of their application in the developing countries, and came up with a model of a merged system for Nigeria electoral commission. The model proposes standard national database filtered from the existing national databases; National Population Commission database (NPCDB), National Identity Number Database (NINDB), Nigeria Communication Commission Database (NCCDB), and Bank Verification Number Database (BVNDB). The merged system was proposed to curb anomalies associated with the existing voter registration system by the Nigeria electoral commission. The system was designed with three main modules (the database, Web Based Voter Registration System, and an Offline Electronic Voter Registration System).

Keyword: Voter Registration, Voter List, Offline, Electronic.

I. Introduction

Voter registration is one of the tools required in a democratic system for the election of officers into public offices. It originated in the early 19th century as a method of disfranchisement [19]. Many immigrants were involved in local elections in the US which became an issue of concern and the only way of disfranchising the non-indigenes was through the registration of indigenes. The purpose was to automatically de-enlist foreigners limiting them from voting [19]. Massachusetts was the first to enact voter registration law in 1801, and was followed by other countries thereafter [11].

In Nigeria, leaders are diehard to scuttle the electoral process to their advantage against the wish of the electorates [24]. This they do by manipulating votes to the favor of their parties. An attempt to correct the ugly trend has not seen the light of the day because the right measure has not been employed.

The manner of handling voter's registration for election of officers into public offices lacks credibility, standard, reliability and efficiency [24]. This has paved way for the installation of wrong leaders who influence the system with unscrupulous acts resulting in election rigging, holding tight to seats of power, falsehood, etc. more so, the Nigeria voter registration process is expensive and inefficient.

Information technology provide lots of alternatives that can be integrated to ameliorate the challenges with voter registration systems in Nigeria, but the system adopted is mere computerization of voter registration [20]. This cannot address issues of multiple registrations, alien and non-indigene registration that are imported into the country consciously to manipulate the process. It has also failed to address the problem of cost and inefficiency of the voter registration process.

Computer provides speed, accuracy, efficiency, portability, timeliness, adequacy and security in its tasks. Minnesota's legislature in 2009 took advantage of the computer and passed bills HF1053 and SF660 in 2009 which require that residents who have state ID or driver's license should be registered automatically which was expected to address the problems of; low voters participation, inaccuracies in voters rolls, voter discrimination and disenfranchisement, wrong purging of eligible voters, time and fiscal cost and potential fraud, [13]

It has become imperative for the introduction of a voter registration system that can correct the anomalies of the existing system in Nigeria if fairness is to be practiced.

II. Research Objectives

The objective of this study is to examine voter registration systems and proposed a better voters' registration system Nigeria as well as growing democracies in the world at large.

III. Concept of Voter Registration System

Voter Registration is one of the major tools for election in a democratic system; it is required for a credible, free and fair election. It is the registration process required of identifying citizens eligible to vote in an election. Details of franchised individuals of a country are compiled into a list of voters called register of voters through voter registration [18]. It is a system that determines the voting strength of a country which guides the body responsible for the conduct of elections and political parties on how to plan and program the election for success.

In US, voter registration is the requirement of a citizen to become registered in order to vote [14]. In some democracies, it is the requirement for citizens and residence to check in with some central registry particularly for the purpose of being allowed to vote in an election [16].

Voter registration is the right of an individual to participate in any given election to exercise his or her franchise. It is concerned with the right to vote, [19]. "Ref.[11], [10]" outline the need for voter registration to include;

- Restrict access to voting
- Ensure that only those entitled to vote in a given jurisdiction can do so
- Ensure that each voter votes only once
- Voter registration list can be used to determine the best location for polling place and know how many voting stations poll workers to be assigned to a given polling place, voter turnout, etc.
- Government agencies may use voter lists, for example to help jury pools.
- Political parties and candidates also use the lists for campaign related activities.

Voter registration varies from country to country. Its cardinal objectives are, to guarantee and enable all those legally qualified to vote to do so; prohibits unqualified persons from voting by ensuring that only qualified voters are registered; and prevent voters from voting more than ones at any once election and ensure equality of the votes [18].

"Ref. [10]" noted that Voter registration process is formulated by electoral law to guide the conduct of elections in a democratic society known as the electoral act, and appropriated by the electoral commission. The Act defines the status of a citizen who is qualified to vote and be voted for in any given election. The criteria considered are basically, age limit, sound state of mind, indigence and legal disposition of citizens A questionable voter registration process, will lead to a questionable election results. "Ref. [1]" noted that free and fair election cannot be undertaken without a proper verification on the voter's fulfillments of legal requirements. Voter registration must be seen as a catalogue of franchise citizens who have right to vote.

Voter registration is the responsibility of the government in some countries, while in others, it is compulsory and is required as part of each citizen's civic duty. Most countries where the voting is not compulsory, citizens' registration are required. This automatically becomes voter registration for citizens [26].

IV. Structure of Voter Registration

"Ref. [18]" discussed the structure of voter registration as follows;

A. Election Administration Body

Voter registration is formulated by the national electoral body and approved by the National Assembly as in the case of Nigeria. The formulation encompasses the nature and the conduct of voters registration exercise, durations and anticipated outcome, financial projections as would be required in the exercise, etc. Once the approval is given with a backup fund from the government, public announcement is made stating the anticipated programme for the voters registration exercise by the electoral body (Independent National Electoral Commission (INEC) in the case of Nigeria).

B. Regulations for Voters Registration

The electoral body of the country by this time brings out specifications with respect to voters registration exercise by organizing public hearing stating the true position of voters' registration on the face of the constituted authority and thereby encouraging citizens to abide. The electoral commission goes further stating the "Dos and Don'ts" as expected of each citizen in the forthcoming voter registration exercise. As at 2006, the Electoral Act of the Independent National Electoral Commission (INEC) stipulated the following certificates for a qualified registrant.

(a) Qualifications: A person shall be qualified for registration if such a person:

- Is a citizen of Nigeria
- Has attended the age of 18 years or above on or before registration date
- Is ordinarily resident in, works in or originates from the Local Government Area or registration area or ward covered by the registration centre

- Is not subject to any legal incapacity to vote under any law, rules or regulations in force in Nigeria
 - Presents himself/herself to the registration officers for registration.
- (b) **Where can a Person Register?:** A person can register only once and at a registration centre designated by the Commission, in the area where he/she;
- Resides,
 - Works in gainful employment, or
 - Originates from (i.e. an indigene).
- (c) **Voter Registration Period:** The registration of voters is usually by stipulated time frame by the electoral body.
- (d) **Hours of Registration:** Registration of voters is also within a stipulated period per day.
- (e) **Display of the Register:** After the registration exercise, the Permanent Voters Register List (PVRL) is displayed for public scrutiny at every registration centre for a period of not less than five days

C. Programme/Planning for Voters Registration

The election body to meet up with voter education will; develops programme of events, employs ad-hoc staff, trains staff, purchase materials required for the voters registration exercise, etc. By this, it is expected that the electioneering body is set to commence the exercise. Materials and people (workers) are thereafter moved to various locations as contained in the program for full implementation of the exercise. Security measures are as well adequately put in place to ensure that citizens' rights are protected as well as electoral workers and property. This will help in the sustenance of the anticipated voters' registration lists.

D. Voters Registration Exercise

This is concerned with the commencement of the voters' registration where adequate publicity is made and voters turn out en-mass to be registered. This can take the form of manual registration as in the case of the developing countries where the voter and the registration officer meet face to face and collect the voter's details which include; names, address, religion, sex, place of birth, occupation, state, ward, polling unit, etc. and posted into a manual voters register, or a computerized voters register. This exercise continues until the anticipated masses are entirely enrolled or the stipulated period has expired. In most cases, after the stipulated period expires, there is addition of some weeks for the continuation of registration tagged "mop-up registration". At the end of the exercise, all data are collated unit by unit, Ward by Ward, local government by local government and state by state to form the voters' registration list for the anticipated election.

E. Voters Registration List

Voter registration list as discussed earlier is the voters register in any given political dispensation which is used as a worthy guide for any given election. Apart from election, a database of registered voters is used for so many functions as a national database of adults.

- **Continuity:** Voters registration exercise in a standard system is continuous and done automatically once a citizen clocks the stipulated age (of 16 to 18 as the case may be) and is of sound mind, void of any incrimination (not bared by any legal act), while for developing countries like those of Africa, voters registration is periodical (that is, each election season or dispensation). This becomes wasteful and is manually based, which gives rooms for maneuver by hungry and desperate politicians. The second case study becomes so expensive, costing government to spend so much on voters' registration periodically, thereby wasting monies, resources and services that would have been used for some other national commitments. Though, for many nationalists who are close to the seat of power, it is preferred as contracts will be awarded and they will in their cruel ways make millions of naira, but for a true compatriot, such habit is deemed unpatriotic.

F. Voter Education

The efficiency of a new developed system cannot account for its usage since it is not using itself. It therefore becomes inexpedient that the sensitization on the new system, its usage, and the expected gains should be communicated adequately to the public for proper awareness.

According to international foundation for electoral systems, voter education and information are critical elements in building voters' confidence in newly introduced technology. Obviously, the success of any new technology is awareness and the operational status. Therefore, adequate education and information on the WBVRS will help in going a long way to achieve the goals of developing the WBVRS.

V. Review of Existing Voter Registration System

Voter registration system from the onset has been carried on manually, but with improvement on technology and information technology, voter registration gradually moves from manual to electronic. Today, voter registration is online as well as web-based. Voter registration from the onset has been associated with a lot of problems. Though there have been several improvements on the existing voter registration system, but the more the improvements, the more the introduction of newer problems.

A. The Avante Voter Registration System

Avante technology proposed and develops electronic voter registration system with optional web-based and or biometric features in 2012. The system was online, or onsite with real time application. It has access to central database with security encryption. It supports standard notebook computers with printers and special signature pad [28].

The voter system was good, but does not adequately address the problems of the developing countries like Nigeria where we lack ICT facilities in most areas. It talks of a central database without giving modalities on how to achieve it. The system was a little improvement on the computerized voter system hence the same procedures would apply except that the Avante system is said to be real time online or onsite. The implementation of the system would be expensive as such is not economical.

B. Fischer and Coleman Registration

In 2002, the Help America Vote Act (HAVA, P.L.107-252) was formulated to come up with an online voter registration with the hope to correct problems associated with the existing voter registration system. The voter system was able to keep track of eligible citizens by assigning election district to prospective voter, and the system was administered centrally at the state level. This system was first implemented in Arizona in 2003 [29], [8].

Though there was improvement in the voter registration, there was also problem of inefficiency in administering voters' record and election. Also, this system will not work in the developing countries as the western world have a centralized database with adequate security, there have sufficient ICT facilities and other technologies that can achieve such a voter registration system which is not the case with developing countries. It is a good system, but will not be a better option recommended for a country like Nigeria.

C. BioLink Biometric Voter registration System

Between 2007 to date, the BioLink technology has been trying to come up with a biometric voter registration for the Nigeria voter registration system with the following features;

1. A full range of biometric parameters to identify the voter's finger prints, iris, voice, etc.
2. Highly customized software modules for both input and output setting
3. Comprehensive data logs and reports for thorough voter activity and monitoring
4. Wide range of support hardware (finger prints, scanners, iris/face cameras, etc.).
5. Highest level security settings for data protection [8].

The proposed voter registration system does not give a clear justification of how to manage the database of voter to achieve the security it spells out, restrict double/multiple registration, registration of foreigners, authentication of voter, etc. Also, the system has not been able to address the fact that most of the technologies mentioned above are not found in most of the remote areas, and the cost of running this system would be high.

D. Online Voters Registration (OVR)

Online voters' registration is the use of Information Technology (IT) in voters' registration. Online registration is specific to internet; this type of registration process uses web-based site or voting applet as intermediary or interface for voters' registration [23]. "Ref. [22]" says the application of information technology in electioneering is paramount as it equips the people with proper awareness. An average person has correct information and proper understanding of each event in the electoral processes and also demands a high level of transparency in the electoral process, which will in turn bring about a higher level of trust in governance. An electronic voter registration system is a voter registration system in which data is recorded, stored and processed primarily as digital information [4]. "Ref. [5]" defines e-voter registration as a voter registration that involves the use of computers. Online voter registration was first formally documented by Arizona in her paperless voter registration having implemented in 2002. Washington came up with legislation on voter registration in 2007 which was implemented in 2008. Due to the relevance of online registration, in August 2013, 13 states were already on online voter registration while other 6 states have passed legislation to create online voter registration system [12].

For any voter registration system, voters' signatures are critical. Signature matching is used in a variety of ways, including voter check-in at polling places as well as signatures on absentee ballot applications and security envelopes containing voter absentee ballots. Most states using paperless online voter registration depend on digitized signatures already on file with divisions of motor vehicles or other national databases to capture a voter's signature.

E. Automatic (Web Based) Voter Registration (AVR) System

Automatic voter registration which is a form of online voter registration employs the use of centralized database using the signature matching and continuous update of citizens' details to pick out citizens who are qualified to register, and who have not been registered. The system then register voter automatically. Immediately such

individuals are registered, a mail showing details is sent to their mail boxes with a guide on how to obtain their permanent voter's cards. In Australia, once a citizen reaches the age of 18, he/she is expected to get registered within 8 weeks, provided other factors are intact, [25].

Automatic voter registration is the most recent voter registration spear headed by the U. S. government which is hoped to be responsible for maintaining accurate and complete voter rolls, shifting our system from its current opt-in structure to an opt-out structure.

"Ref. [27]" is of the view that, will automatically register all eligible citizens to vote. They further stress that automatic registration will eliminate the haphazard complexity of voter rolls with automatic processes.

"Ref. [7]" opines that automatic registration would significantly reduce duplications and omissions on the voter rolls, resulting in a system that balances the twin goals of election accessibility and security.

In 2016, Oregon was the first state in American to implement AVR. Beaver state saw a quadruple rise at DMV offices of voter registration due to AVR. Vermont on New Year's Day 2017 after implementing AVR for six months noticed registration rate jump of 62% compared to the first half of 2016 [17].

The introduction of IT to voter registration will not only lead to fair and credible elections, but will foster a more convenient approach to voter registration and voting both on the side of the government and the people, [21]. One of the ways of employing IT in voter registration is the "web-based voter registration".

F. Offline Electronic Voter Registration (OEVR)

In developing and under developed nations, it is obvious that access to most basic amenities such as electricity, good roads, health, education, ICT, etc. is concentrated in the cities. This does not permit for equal distribution of processes that require an advanced technology. Most of our communities have no access to GSM, talk less of internet facilities. This becomes difficult in considering the implementation of web-based voters' registration in such areas.

To overcome this challenge and go on implementing web-based voter registration system is the introduction of offline e-voter registration system. An Offline E-Voter Registration System (OEVRs) is a computerized voter registration system which is not online, but works with a Principal Component Analysis (PCA) algorithm using face recognition, other biometrics or a combination of biometric identities [4]. According to [4], OEVRs is an example of E-Voter registration system that makes use of voter registration machine or electronic pooling booth but not with the internet. OEVRs tries to find an identity of a given image using the criteria identity provided as stored in the knowledge base which is generally simulated by a training set. The features extracted from the registrant are then matched with the feature in the database which authenticates an indigene and qualifies same for to, or not to be registered. The biometric feature mostly used in OVRs is the **face recognition**. The task of the recognizer is to find the most similar feature vector among the training set to the feature vector of a given test image.

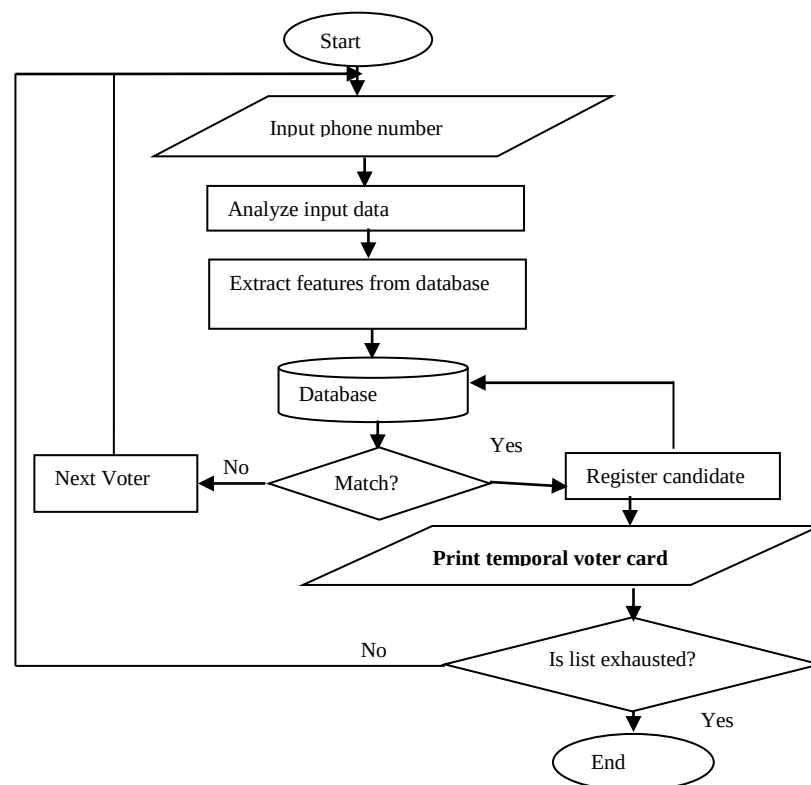


Fig.1: Flowchart for OEVRs

VI. Need for a New Voter Registration System

Voter registration system needs to meet the current trends on how things are done with the full integration of ICT. Increase speed of process leading to avoidance of time wastage; elimination of rancor were voters queue for several days or hours to vote leading to less voters registering; elimination of double/multiple registration of voters; restricts foreigners from registering which was the primary cause for the introduction of voters registration; ensuring that only qualified candidates are registered; ensuring that voters list generated from the voter registration is authentic, and so on, should be the features of voter registration system for Nigeria.

The Nigeria current voter registration system gives opportunity for, voters' lists to be easily manipulated leading to falsity in election. This enables those in power (political, economic or social) to plant their candidates against the will of the people, as such, the people work directly by the directives of their political godfathers and not the electorate. This is evidenced in the kind of political systems we have today, where "Ref. [9]" in an interactive section with Bode George noted that;

"what is the president's business with the activities of the governors? It is the members of the state house of assembly who can challenge the governor about his revenue, expenditure and what he is doing with the money. But we know that when the man sits down in one room and selects his surrogates who go to the House of Assembly, he does not allow people who are being sponsored, supported by their constituencies to go there, what do you expect? Like what is happening in Lagos State where Bola Tinubu just hand picks people who go to the Lagos House of Assembly and who therefore cannot challenge him".

Also "Ref. [2]" on the governors' forum reported that;

"as long as men get elected into positions in Nigeria because of very deep pocket, godfatherism, or power connection and not through the wish of the electorate expressed through the ballot, the specter of very powerful elected officials who get away with anything they do will remain with us."

The proposed voter registration system is hoped to eliminate all the anomalies in voter registration that leads to abnormality in elections.

"Ref. [3]" posit that the biggest problem with conventional voting method was in the most significant loss in terms of manpower, time, and money.

"Ref. [6]" stated that the application of IT reduces crime in advanced countries because it uses satellite and other monitoring devices. He further opined that Web-Based Voter Registration System can be used to reduce paper work, improve efficiency, transparency, accountability and expedite the decision making process.

"Ref. [3]" observed that computer is taking over every process in the global community because of its effectiveness and reliability and should therefore be urgently required in voting system

VII. Proposed Voter Registration System for Nigeria (Merged Voter (Web Based/Offline Electronic) Registration System)

The researchers having analyzed the existing voter systems and the peculiarities of the Nigeria factors and environment, proposed a merged voter registration system for Nigeria. The proposed merged voter system will be the combination of Automatic (Web Based) voter registration system with an offline electronic voter registration system. The Web Based voter registration will make use of an enhanced central national database integrated from the existing national databases.

The enhanced national database should filter citizens' data automatically from Bank Verification Number database (BVN), National Identity Number (NIN) Database, National Population Commission (NPC) database and the Nigeria Communication Commission (NCC) database. The filtering should use individuals' biometrics as primary key such that, no one individual is repeated more than ones.

In the cause of filtering, alteration in individual records such as name, date of birth, etc should be communicated through appropriate means to such stating the alteration. This will enable the person concern to harmonize his or her data at respective databases. Failure by the concerned person, the system will register the most current information against the person and ignore orders. The database updates itself automatically once new registrations are made. All phone numbers belonging to an individual are registered against him without duplication of data.

Voter registration is initiated automatically to citizens in the enhanced national database who reached the age of 18 years. This should be done with a message sent to the target person's phone numbers as contained in the database notifying same of registration and other information as may be necessary. By this, a voter is registered irrespective of place or location and he votes alike. Permanent voter's card are then produced and transmitted to owners accordingly.

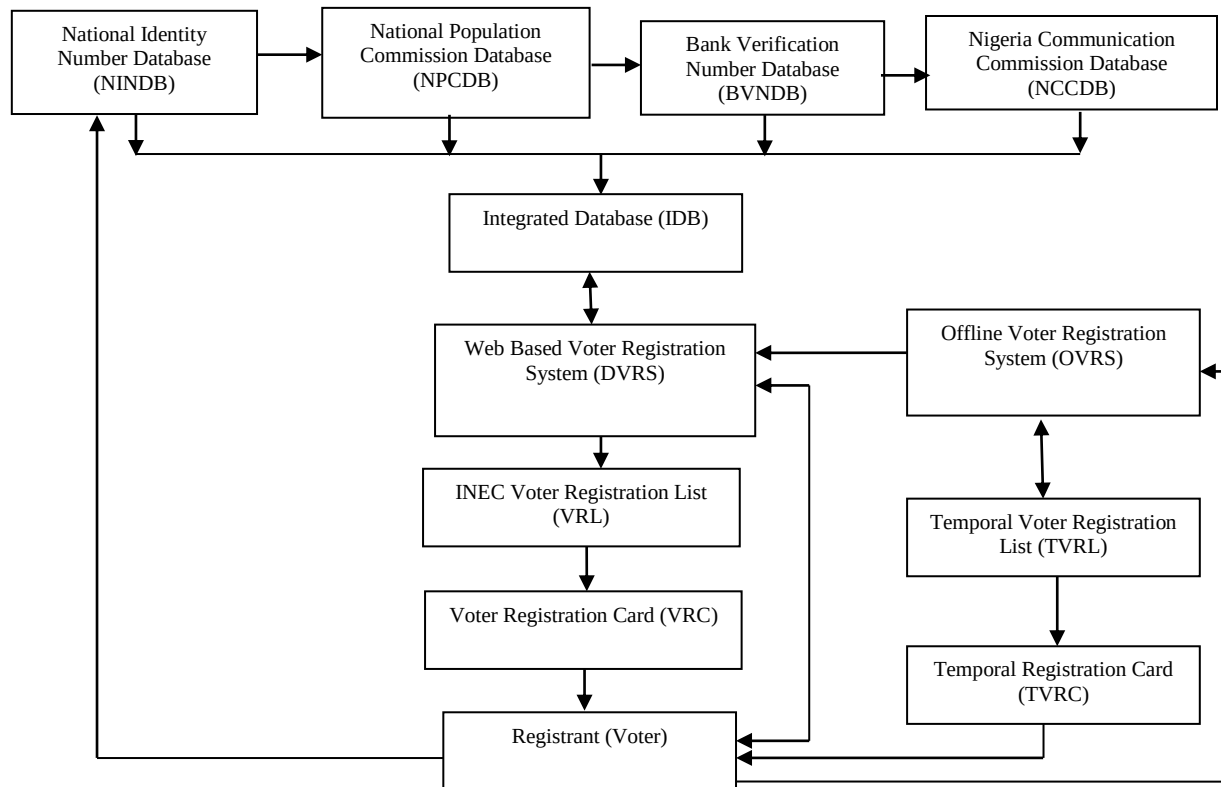


Fig .2: Model of the Proposed System

Figure 2 is analyzed as follow;

1. Automatic register of a voter if the prospective registrant is due (i.e. meets the registration requirements as stated in the law of the land).
2. Maximal registration of citizens, checks duplicate and multiple registrations and ensures that the right person is registered.
3. Creates much flexibility for registrants and the registration body to go about voter registration exercise
4. Cuts down cost of running voter registration drastically.
5. Brings about reliability and dependability in voting and voter registration and as well makes voting and voter registration timely, effective and efficient.
6. Web-based voter registration creates a central database for voters which are accessible online with great flexibility for collation and manipulation of voters register and other related information which outweigh the bulky collection of manual voters registration list in files piled in cabinets which occupies a lot of spaces.
7. Web-based voter registration system makes room for easy access and storage of registrant information by providing a platform through which such information could be filtered provided the request for such information passes the scrutiny requirements.
8. The issues of loss of voter's data, and all other security issues can easily be addressed with online voter registration. It would be difficult to eliminate voters' information from the net or gain access to voters' information or data where you are not authorized. Web-based voter registration is equally a ginger to web-based voting system which when run concurrently with the web-based voter registration system will generate results that are beyond imagination.

For those residing out of network coverage, the Offline Electronic Voter registration system (OEVRs) will be employed. Electronic voter registration form templates are use to manually register the voters by electoral officer periodically. The templates are collated into an OVRS voter list. The list is then authenticated from the enhanced national database. Those who are authenticated are included in the voter list, while those who are not are discarded. The proposed system is detailed in the fig 2.

The OEVRs will enable for the authentication of voters who reside outside network coverage. This will checkmate those who take advantage of the vulnerability of the system and troop in foreigners to register.

“Ref. [17], [15]”, automatic voter registration in the US offers;

1. A new way forward that can be help to open access to the trenches and improve American democracy.
 2. Avenue to keep voter rolls more accurate by creating a constant stream of updates between registration agencies and election officials, and by reducing the odds of mistakes caused by processing registration forms by hand.
 3. Common sense reforms, increase registration ratios, clean up the voter rolls, and safe state money.
- Arizona in 2012 implemented E-Election and recorded much success over the traditional system in practice. It was uncovered that there was cost savings as well as increased accuracy in its voter rolls. The cost of traditional voter registration system which is associated with paper registration was 83 cents, while the cost of an online registration was 3 cents. (Online Voter registration, 2014)
- Notwithstanding, proposed voter registration will be disadvantageous to those who would want to explore most of the avenues created by the vulnerability of the existing voter registration for their selfish interests.

VIII. Conclusion

This study was conceived with the burning desire of overhauling the electoral systems of developing countries toward maintaining standard in our electoral system. Also to improve on the electoral systems of the developing countries toward meeting the world standards. These standards are achieved and driven by Information and Communication Technology (ICT).

This study investigated the exiting voter registration system as implemented in the developing countries taking Nigeria as a case study, analyses the weaknesses associated with the existing system and proposed a merged voter registration system for Nigeria electoral system.

This system if developed and implementation, will fit in the current trend needed in voter registration which that has the potentials of transforming the Africa electoral system for good. It is position of the researchers that the system would correct most of the misnomers associated with voter registration in Nigeria. The system being web-based merged with Offline Electronic Voting System will encourage total registration of citizens who are qualified since registration can now be automatic. It will be able to eliminate multiple/double registration of voters since each voter has identification number and can never be allowed with more than one registration. Cost voter registration will be been dropped drastically as most of the paper work, ad-hoc staff; training, etc. will be reduced to web-based both in storage and operations. The system will be able to eliminate the burden on voters to queue up for hours or days waiting to be registered, hence registration are automatic. The proposed system should therefore be adopted, developed and implemented for the desired pragmatic change in our voter registration.

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