Modeling a Distributed Database System for Voters Registration in Nigeria

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Abstract.
The Independent National Electoral Commission, Nigeria is characterized for managing large volume of dispersed data making distributed data processing a necessity. When voter rolls are error-ridden and a quarter of eligible voters cannot vote, registration laws are not only failing their primary function of ensuring that voters are qualified to vote but also acting as barriers to citizens democratic participation. The traditional voter registration methods employed by many developing countries for periodic elections have many associated problems such as incomplete, inconsistent, unavailability and erroneous records. This article presents an application of distributed database system for a complete and continuing voter registration in Nigeria. The system has its component parts physically stored in a number of distinct real databases at a number of distinct sites. Each site has its own local real databases, its own local users, its own local DBMS and transaction management software including its own local locking, logging, recovery, replication, fragmentation, e.t.c. software and its own local data communication manager. Distributing data across sites within state and local government allow voters data to be resident where they are generated or most needed, but still accessible from other sites within the state and local government areas. Java and Oracle were the developmental platform of the system. Some important relations for the systems were presented and possible management transaction and operation models were presented. The system require a Unix/windows NT operation system in a network environment such as provided by communication networks in Nigeria and an internet connection.

Keywords: Distributed system, Fragmentation, Replication , Smart Card, Voter Registration

1.0 INTRODUCTION

In a well-functioning democracy, voting should be protected as a fundamental citizenship right and responsibility [1]. Accurately registering every eligible voter to vote is a necessary step toward protecting this right, yet a very high percentage of eligible Nigerian citizens voters are not registered and many people are registered inaccurately or engage in multiple registration.

An "automated" voter registration system is one in which government offices, including social service offices, collect and transfer voter registrations to election officials without using separate paper forms but direct capture machines [2]. These offices enter registration data into their computers and transfer them electronically, in a format that election officials can securely review and upload directly into their voter registration database systems. Many developed States such as Arkansas, California, Georgia, Kentucky, Michigan, New Jersey, North Carolina, South Carolina, South Dakota, Texas and even Nigeria are already at this stage. An alternative approach which is an "online" registration system is one that allows individuals to submit a voter registration application over the Internet. Six states such as Arizona, Colorado, Kansas, Louisiana, Oregon, and Washington currently have online systems in place for individuals who have a driver's license or non-driver's identification card. At least five more states like California, Indiana, Nevada, North Carolina, and Utah are developing similar systems.

The Federal Republic of Nigeria, with an area of 923,769 square kilometers (made up of 909,890 square kilometers of land area and 13,879 square kilometers of water area. The 2006 national population census puts the country population at 140,431,790 people. The country is subdivided in 39 states plus Federal Capital Territory (Abuja). The states are further divided into a total of 774 local government areas [3]. Democracy in Nigeria is still in the struggle to leapfrog to an ideal democratic setting. Usually, every election in Nigeria is associated with fraud of various dimensions. Nigeria is in the 4th republic yet it is embarking on new voters register. One thing is for sure, there are no effective registration system to enhance complete, accurate consistent and continuous voters register which is a pre-requisite for a credible election.

As [1] notes, when voter rolls are error-ridden and a large number of eligible voters cannot vote, registration laws are not only failing their primary function of ensuring that voters are qualified to vote but also acting as barriers to citizens democratic participation. In Nigeria, many eligible voters are disfranchise and a left with no other choices.

To address these deficiencies with regards to voters registration, one needs a robust, efficient and effective information technology system, that can systematically register every eligible voter in Nigeria and give them information about voting mechanics and electoral choices. Such a modern and universal voter registration approach would include the design of a Distributed Database System for the Independent National Electoral Commission (INEC) that is saddled with the responsibility of ensuring a complete, accurate and effective voter registration list of citizen and participations. The framework for the database architecture and structure presented. This article shall also present models for the transaction, operational and processes inherent in the system.

The distribution of data in a network or decentralized computer system offers several attractive advantages over the centralization of data at a single computer. These advantages include increased data reliability; faster, localized access to data; and the potential for upward scaling of data capacity [4].

2.0 Literature Review

In [5] and [6] a distributed database system consist of a collection of sites, connected together via some kind of communications network, in which, each site is a full database system site in its own right, but the sites have agreed to work together so that a user at any site can access data anywhere in the network exactly as if the data were all stored at the user's own site. This follows that a distributed database is really a kind of virtual database, whose component parts are physically stored in a number of distinct real databases at a number of distinct sites and each site has its own local real databases, its own local users, its own local DBMS and transaction management software including its own local locking, logging, recovery e.t.c. software and its own local data communication manager. In particular, a given user can perform operations on data at that user's own local site exactly as if that site did not participate in the distributed system at all.

The Distributing data across sites within state and local government will allows those data to reside where they are generated or most needed, but still to be accessible from other sites in the state and local government areas. Keeping multiple copies of the database across different sites will allows continuous database operations even when one site is affected by a natural disaster, such as flood, fire, or earthquake or manmade incidences. Distributed database systems is structured geographically or administratively distributed data spread across multiple database systems. [7] opined that the central function of a distributed database system is to provide access to data while maintaining the integrity and consistency of that data. The system must have the ability to support large numbers of users without sacrificing performance. Higher reliability and availability in the presence of equipment and network failures are requirements for mission critical enterprise data systems. These

requirements are often at odds with each other, leading to solutions that compromise between availability, consistency, scalability and performance.

Many researchers who have used distributed database system for the management of their enterprise data, including [8]. A computer-based healthcare record system being Developed for Boston's Health care for the Homeless Program (BHCHP) uses client-server and Distributed database technologies to enhance the delivery of healthcare to patients of this unusual population. The needs of physicians, nurses and social workers are specifically addressed in the application interface so that an integrated approach to healthcare for this population can be facilitated. Usually, patients and their providers have unique medical information needs that are supported by both database and applications technology. To integrate the information capabilities with the actual practice of providers of care to the homeless, the computer-based record system was designed for remote and portable use over regular phone lines. An initial standalone system was used at one Major BHCHP site of care. The project describes methods for creating a secure, accessible, and scalable computer-based medical record using client-server, distributed database design.

Also in the study of [9], Studies of voter turnout across states find that those with more facilitative registration laws have higher turnout rates. Eliminating registration barriers altogether is estimated to raise voter participation rates by up to 10%. The article presents panel estimates of the effects of introducing registration that exploits changes in registration laws and turnout within states. New York and Ohio imposed registration requirements on all of their counties in 1965 and 1977, respectively. Also in the study they find out that the introduction of registration to counties that did not previously require registration decreased participation over the long term by three to five percentage points. Though significant, this is lower than estimates of the effects of registration from cross-sectional studies and suggests that expectations about the effects of registration reforms on turnout may be overstated.

In the article of [10] State Congress enacted the National Voter Registration Act (NVRA) of 1993 in order to establish procedures that will increase the number of eligible citizens who register to vote in elections for Federal office. The NVRA mandates simultaneous voter registration and registration updates with driver's license applications and renewals; use of mail registration forms; the establishment of agency-based registration forms at state offices, including public assistance and unemployment compensation offices; and restrictions on purging of voter registration rolls and States without voter registration requirements (ND) and states which permit election-day registration at the polling place are exempted from the requirements of NVRA .

2.1 Nigerian Voters Registration.

The Federal Republic of Nigeria in 2010 had electronic voter registration. Each registration centre was equipped with a laptop computer, fingerprint scanner, a camera for photo passport and a printer for quality voters card. When a person comes in to apply for registration, his/her biometrics details are captured digitally, that is, digital images of his/her photograph, fingerprints and signature will be taken/captured using the Data Capture Machine (DCM). The intention of government is to have a clean, complete, permanent, and updated list of voters through the adoption of biometrics technology in the registration process. Any Nigerian citizen who is at least eighteen (18) years of age. A resident of the Nigeria for at least one (1) year and in the place wherein he proposes to vote for at least six (6) months on or before the day of the election; and Not otherwise disqualified by law are eligible to register. Eligible voters personally appear before the registration officer, state his/her name and exact address, specifying the house number, name of street, and local government area. AT the end of the voter registration exercise, capture data where processed and released. How accurate and authentic this

records are leaves more questions to be answered.

The chairman of INEC in one of his speeches claimed that the 2011 national voters registration will be in line with that of 2008 voters registration in Bangladesh. Bangladesh employed 30,000 direct capture machine and took between 8 to 11 months to embark on the exercise. The Bangladesh Army has selected MegaMatcher SDK multi-biometric technology to identify duplicate registrations in the nation's voter database. The Bangladesh Voter Registration Project registered more than 80 million citizens using biometric face and fingerprint technology. After evaluating a number of biometric technologies for their duplicate search system, the Bangladesh Army determined that MegaMatcher from Neurotechnology was able to identify more duplicate registrations with a higher degree of accuracy than any other system tested [11]. According to the article, System integrator Dohatec New Media was hired to help design and implement the MegaMatcher-based system. To date, more than 48 million voter registration records have been matched. The Dohatec Biometrics Fusion Server system uses MegaMatcher Client to generate templates from face and fingerprint images that were captured with a BIO-Key system, then the match technology is used to search the database and identify duplicate records. Bangladesh runs MegaMatcher on Microsoft Windows XP and Microsoft Windows Server with Microsoft SQL Server as the back-end database. MegaMatcher provides the high speed and reliability required for the development of national-scale automated fingerprint identification systems (AFIS) and multi-biometric face/fingerprint identification systems. Suitable for both civil and forensic use, the system includes both fingerprint and face identification engines with a fusion algorithm that allows the two technologies to work together to provide very fast 1:N matching with even higher reliability than AFIS or facial recognition alone.

2.2 Theoretical Background of Distributed Database.

The data which frequently resides on multiple sites inside an organization might be managed by several Database Management Systems for multiple reasons such as scalability, performance, access and management, [12, 5, 13] Thus, the information requirements for executing transactions and answering questions might not reside in a single site. Distributed Database Management Systems deal with distributed database as a single logical database, and the principles and techniques of Database Management Systems are still applicable to the distributed one; although the distributed one has special characteristics. A distributed database management system is a software that support the transparent creation, access and manipulation of interrelated data located at the different sites of a computer network [14]. Furthermore, [15] describe a distributed Database Management System (DDBMS) governs the storage and storage of logically related data over interconnected computer system in which both data and processing are distributed among several sites. Each site of the network has autonomous processing capability and can perform local applications. Each site also has the potential to participate in the execution of global application, which is to improve the accessibility, compatibility and performance of a distributed database while preserving the appearance of a centralized database management system [14]. Moreover, Distributed database system are very complex systems that have many interrelated objectives of transparency, heterogeneity, autonomy, high degree of function, extensibility and openness and optimized performance. It should be noted however, that, data allocation is done largely at the discretion of the database designer or database administrator [5, 14, 16].

A typical DDBMS consist of four major component [16], of the Local DBMS component responsible for controlling the local data at each site that has a database and has its own local system catalog that store information about the data held at that site. It contains the Data Communication (DC) component which is a software that enables all sites to communicate

with each other and the Global System Catalog (GSC) with functionality to hold information specific to the distributed nature of the system such as fragmentation and allocation schemas [16, 15] and the Distributed DBMS component is the controlling unit of the entire system. A distributed system requires functional characteristics that can be grouped and described as transparency features. These were discussed in [15] as distributed, transaction, failure, performance and heterogeneity transparency.

The database is physically distributed across the data sites by fragmenting and replicating the data [17]. Given a relational database schema, fragmentation subdivides each relation into horizontal or vertical partitions. Horizontal fragmentation of a relation is accomplished by a selection operation which places each tuple of the relation in a different partition based on a fragmentation predicate. Vertical fragmentation, Divides a relation into a number of fragments by projecting over its attributes. Fragmentation is desirable because it enables the placement of data in close proximity to its place of use, thus potentially reducing transmission cost, and it reduces the size of relations that are involved in user queries. Based on the user access patterns, each of the fragments may also be replicated. This is preferable when the same data are accessed from applications that run at a number of sites. In this case, it may be more cost-effective to duplicate the data at a number of sites rather than continuously moving it between them [6].

[4] consider a network of interconnected computers. Each computer, known as a node in the network, contains a distributed database management system (DDBMS) and a possibly redundant portion of the database. Data are logically viewed in the relational data model. The unit of data distribution is a relation. The DDBMS will maintain system directories so that each query will receive a nonredundant consistent mapping of its required data. Data transmission in the network is via communication links. The data transmission cost between any two nodes is defined as a linear function $(X) = c_0 + c_1X$, where X is the amount of data transmitted. The our cost measure in units of time. The constant c_0 represents an initial start-up time for each separate transmission

A relation r is fragmented into fragments $r_1, r_2, \dots, r_n$ either horizontally or vertically. According to [12, 5, 13] horizontal fragmentation involves a relation r is divided into a number of subsets, $r_1, r_2, \dots, r_n$. Each tuple of relation r must belong to at least one of the fragments, so that the original relation can be reconstructed. Canonically, a horizontal fragment can be defined as a selection operation on the global relation r. That is, a predicate p_i to construct fragment r_i.

$$r_i = \sigma p_i(r)$$

and to reconstruct the relation r, the union of all the fragment is taken, thus

$$r = r_1 \cup r_2 \cup \dots \cup r_n$$

In turn, vertical fragmentation of $r(R)$ involves the definition of several subsets of attributes $R_1, R_2, \dots, R_n$ of the schema R so that

$$R = R_1 \cup R_2 \cup \dots \cup R_n$$

each fragment r_I of r is defined then by

$$r_i = \prod_{k=1}^{n} R_i(r)$$

And to reconstruct r, the natural join is taken as

$$r = r_1 \bowtie r_2 \bowtie r_3 \dots \bowtie r_n$$

One way to ensure a successful relation reconstruction is to include the primary-key attributes of R in each R_i.

[16] included the mixed fragmentation of a relation consisting of a horizontal fragment that is subsequently vertically fragmented or a vertically fragmented that is then horizontally fragmented. This approach is defined using the selection and projection operations of relational algebra. Given a relation R, a mixed fragment is defined as

$$\sigma_p(\pi_{a1,\ \dots,an}(R))$$
$$\pi_p\left(\sigma_{a1,\ \dots,an}(R)\right)$$

[5] presented this scenario in form fundamental fragmentation rules as:
Rule 1: Completeness. If a relation instance R is decomposed into fragments $R1, R2, \dots Rn$, each

data item that can be found in R must appear in at least one fragment. This rule is necessary to ensure that there is no loss of data during fragmentation.
Rule 2: Reconstruction. It must be possible to define a relational operation that will reconstruct the relation R from the fragments. This rule ensure that functional dependencies are preserved.
Rule 3: Disjointness. If data item d_i appears in fragment R_i, then it should not appear in any other fragment. Vertical fragmentation is the exception to this rule, where primary key attributes must be repeated to allow reconstruction. This rule ensures minimal data redundancy.

Also in [12] access to various data item in a distributed system is usually accomplished through transaction, which must preserve the ACID properties [16]. The transaction can either be local or global transaction.

2.4 Voter Registration Model

Voter Registration is a procedure required of prospective voters and used to establish their identity and place of residence prior to an election so that they are certified as eligible to vote in a precinct. The purpose of voters registration is to dimish opportunities for election day vote fraud, [20]. Voter registration exists for the fundamental reasons of Registration information used to control who votes. Only those who are eligible to vote can register, and that eligibility is verified when the individual registers to vote. Also, registration information is used to authenticate voters when they participate at poll sites. Thus, voter registration exists to control access, and to prevent voter fraud. Other reason is that Registration information is used for election management and for other election administration tasks. Voter registration lists contain the addresses of those eligible and registered, and that information is used for many purposes ranging from provision of polling places to insuring that every voter receives the ballot they are supposed to receive when they go to vote. Voter registration is also used to maintain historical information to manage voter lists going forward and to provide evidentiary information in case of a challenge to the outcome of an election [21].

Today, voter registration is a massive, complex, and dynamic database problem. At the national level, one must keep track of something more than 70 million registered voters and in a database with more than 70 million records, and many pieces of information about each registered voter, typographical and other errors are inevitable. Furthermore, Nigerian population is dynamic; voters move very frequently each year, according to data from the 2006 National Population Census, new voters are constantly entering the picture, by becoming eligible to vote i.e. turning 18 and also voters are constantly leaving the eligible electorate, either by death or other reasons. There are some specific proposed policies to achieve goals of complete voters registration: vis:

a. uniform age of sixteen for advance voter registration
b. registration of high school students during compulsory government examinations
c. automatic registration of citizens obtaining driver's licenses and learner's permits, marriages permit and any other forms of government registration
d. print and online voter guides; and
e. television and radio time devoted to election information.

In the case study, Nigeria, Periodic registers in which a register could be established for a single electoral event or for any electoral events occurring within a defined period is very common. Periodic registers generally require voters to register a new and previous registrations are not taken into account. Although the use of modern technology, was involved in the exercise, data capture, storage, retrieval, update, dissemination of information is still a challenge. Voters information are characterized with inconsistency, duplication, redundancy and also the integrity of data and efficiency is very poor. Identity documents containing photographs, signatures or

finger/thumb prints are usually generated using specialised systems designed to produce identity cards while the subject is present. In these cases, textual information is printed on hardcopy using data either provided on the spot or data extracted from a database. The voter usually signs this hardcopy record, and/or makes a fingerprint or thumbprint. The operator places the hardcopy printout, including the signature and/or finger/thumb print in the device, and takes a photograph of the person. The device then prints an identity card including a copy of the printed data, the signature and/or finger/thumb print and the photograph. The card is usually laminated and the integrity may be improved by including tamper-evident security devices such as holograms or embedded print to make it difficult to forge or alter the card. This phenomenon may be continuous register that can be constantly kept up-to-date by amending and adding voter records whenever necessary. A database systems can be used to easily update records and add new records, as well as keep track of amended and deleted records.

Voter register databases system can be used to manage subject data. When photographs, signatures or finger/thumb prints have been digitised and stored in a database, various methods exist to manipulate such data types and also have it printed on identity documents by the voter register database system. In recent times, identity cards can be produced in the form of Smart cards, incorporating magnetic strips or data chips to store electronic data about the person who is the subject of the card. This data may include bio-identification data. the smart cards can be used with smart card readers and bio-identification readers such as finger print scanners to automatically verify a person's identity. Smart cards can be “read only” cards that simply contain information about the subject or can be “read-write” cards, which have the information contained on the card updated as the cards are used. For example, a read-write card used to verify a person's right to vote could, once used, be recorded as having been used for that election, so that it could not be used for voting in that election again. Where smart cards are used in polling places, they could be used to replace current methods of recording that a person has voted. Where a voter uses a smart card at a polling place to verify his or her right to vote, the smart card reader could at the same time record that that person had voted and transmit that data to a central database during or after polling. Though provision of smart cards to voters and smart card readers to polling places is expensive, users need to weight the advantages against the expense. Moreover, Smart cards incorporating an electronic identity could also be used for voter registration or voting by computer over the Internet or at a computer kiosk, provided the computer was equipped with a smart card reader. Embedded modules can be used to perform a range of tasks that can assist in reducing instances of fraudulent registration or voting and to identify and delete instances of duplicated voter registration records. Voters Registration in Bangladesh is a good example to emulate.

Software can perform various comparison routines to determine whether a person applying for registration is already registered, perhaps at another address. Electronic searches can be programmed into voter registration databases to identify whether a person applying for registration is already on the register.

In general, the Caltech/MIT Voting Technology Project (VTP) has outlined five basic standards that a voter registration system must meet, Registration information must be accurate and complete, must be immune from fraud, be dynamic and up-to-date, be usable by election officials at polling places and must be easy for eligible individuals to register to vote. Current and future voter registration systems should be assessed relative to these standards. The INEC can be seen as enterprise that is distributed already, at least logically into National, State and local governments and perhaps wards from which it follows that data are distributed already as well because it is expected that each unit of the INEC will naturally maintain data that is relevant to its own operation. The total information asset of the INEC then is thus

splintered into what are sometimes called island of information. The distributed system provides the necessary bridges to connect those islands together

Relational Model:

A formal way of presenting a relation schema. Let $R(f_1: D_1, \ldots, f_n: D_n)$ be a relation schema and for each $f_i, 1 \leq i \leq n$, let Dom_i be the set of values associated with the domain named D_i. An instance of R that satisfies the domain constraints in the schema is a set of tuples with n fields:

$$\{\langle f_1: d_1, \ldots, f_n: d_n\rangle | d_1 \in Dom_1, \ldots, d_n \in Dom_n\}$$

The 5 different relations are required for this system, includes

$\boldsymbol{State}[statecode, statename]$
$\boldsymbol{Lga}[lgacode, lganame, statecode]$
$\boldsymbol{Ward}[wardcode, wardname, lgacode]$
$\boldsymbol{Unit}[unitcode, unitname, Street, wardcode]$
$\boldsymbol{Voter}[regno, fname, lname, othername, sex, datebirth, address, hometown, occupation, employer,$ passport, thumb, $lga, state, unitcode]$

Figure 2 presents the schematic structure of the 5 relations

Notations

Number of States $= i$
Number of Local government area $= j$
Number of wards per local government $= k$
Number of Units per ward in a local government area which may vary $= l$
Therefore we can represent the state, lga , wards and units as:
States $= S_i, \quad i = 1, 2, 3, \ldots, 36$
Local government areas $= L_{ij} \quad i = 1, 2, 3, \ldots, 36; j = 1, 2, \ldots, n$
Wards $= W_{ijk} \quad i = 1, 2, 3, \ldots, 36; j = 1, 2, \ldots, n; k = 1, 2, \ldots, m$
Units $= U^l_{ijk} \quad i = 1, 2, 3, \ldots, 36; j = 1, 2, \ldots, n; k = 1, 2, \ldots, m; l = 1, 2, \ldots, o$

Estimates

Total number of registered voter in state i, lga j, wards k and units Poll Units l is given as $cU^l_{ijk} = count_{l=1:o}(U^l_{ijk})$
Total number of registered voter in state i, lga j, in wards k is given as $cW_{ijk} = \sum_{l=1}^{o} cU^l_{ijk}$
Total number of registered voter in state i,in lga j, is given as $cL_{ij} = \sum_{k=1}^{m} cW_{ijk}$
Total number of registered voter in state i is given as $cS_i = \sum_{j=1}^{n} cL_{ij}$

Sample Queries

Case1- The Database support location transparency

```
SELECT *
FROM Okitpupa
WHERE lgacode = '16-OKP'
UNION
SELECT *
FROM Irele
WHERE lgacode = '16-IRE'
UNION
SELECT *
FROM Akure_South
WHERE lgacode = '16-AKS'
```

Case2- The Database support location transparency

```
SELECT *
FROM KTP NODE W1
WHERE AGE > = 18
UNION
SELECT *
FROM KTP NODE W2
WHERE AGE > = 18
UNION
SELECT *
FROM KTP NODE W3
WHERE AGE > = 18
```

2.5 The Intranet

Intranet standard for exchanging e-mail and publishing web pages are becoming interestingly popular for business use within closed networks called Intranets. A typical intranet is connected to the wider public internet through a firewall with restriction imposed on the types of information that can pass into and out of the intranet [16].

Table 4: Poll Details list

pollunit	pollname	street	ward

Table 1: Voter Register list

votid	pollunit	employer	fname	lname	Othere	dateobirth	originn	birthplace	occupation	passport	thumb
OND14-U01-102	OND14-	Self	Labake	Jayeoba	Joy	12/4/1967	Ondo	Ilutitun	Farmer	OND14-U01-102P	OND14-U01-102T
OND1 U01-103			nle	Adebowale		3/5/1970	Kwara	Mase	Teacher	OND14-U01-103P	OND14-U01-103T
OND1 U01-104			le	Adebowale	Unice	12/12/1976	Ondo	Ilutitun	Teacher	OND14-U01-104P	OND14-U01-104T
OND1 U02-105			l	Adebobaje		5/3/1966	Ondo	Ilutitun	Nurse	OND14-U02-105P	OND14-U02-105T
OND1 U02-106			bora	Orimogunje	Edward	4/2/1978	Ondo	Erinje	Tailor	OND14-U02-106P	OND14-U02-106T
OND1			uyi	Ibikunle		11/13/1975	Ondo	Igbotako	Farmer	OND14-	OND14-

Table 2: State list

StateCode	StateName
ABI	Abia
ADA	Adamawa
AKW	Akwa Ibom
ANA	Anambra
BAU	Bauchi
BAY	Bayelsa
BEN	Benue
BOR	Borno
CRO	Cross River
DEL	Delta
EBO	Ebonyi
EDO	Edo

School, Igbotako

	D14-7	Abodi, Ikoya	Liliken	OND14-W13
	OND14-U08	Jemiken, Ilutitun		
	OND14-U09	Court Hal Erinje		

Table 3: Local Government Areas list

LgaCode	LgaName	StateCode
OND01	Akoko North East	OND
OND02	Akoko North West	OND
003	Akoko South East	OND
004	Akoko south West	OND
005	Akure North	OND
006	Akure South	OND
007	Ese-Odo	OND
008	Idanre	OND
009	Ifedore	OND
010	Ilaje	OND
011	Ile-Oluji-Okeigbo	OND
012	Irele	OND

Table 4: Ward list

WardCode	WardName	LgaCode
OND14-W01	Ilutitun Ward 1	OND14
OND14-W02	Ilutitun Ward II	OND14
OND14-W03	Ilutitun Ward III	OND14
OND14-W04	Igbotako Ward I	OND14
OND14-W05	Igbotako Ward II	OND14
OND14-W06	Igbinsin	OND14
OND14-W07	Okitipupa Ward I	OND14
OND14-W08	Okitpipupa Ward II	OND14
OND14-W09	Irinje Ward I	OND14
OND14-W10	Irinje Ward II	OND14
OND14-W11	Okunmu Ward I	OND14

Figure 2. Database Relational Structure of the voters Registration System

Three tier model which solves the problem of enterprise scalability is proposed with the following layers of architecture.

a. The user interface layer which runs on the end-user's computer (the client)
b. The business logic and data processing layer. This middle tier runs on a server and is often called the application server
c. The DDBMS which stores the data required by the middle tier. This tier may run on a separate server called the database server.

The implementation language is java. Java is a proprietary language developed by Sun Microsystem and currently marketed by Javasoft. According to [19]. The importance of Java language and its related technologies has been increasing for the last few years. Java [22] is a type-safe, object oriented programming language that is interesting because of its potential for building web application (applets) and server application (servlets).

Java as explicitly defined is a simple, object-oriented, distributed, interpreted, robust secure, architecture neural, portable, high-performance, multi-threaded and dynamic language [23].

Conclusion

Voter registration is one of the stages at which there are ample opportunities to manipulate election results. For this reason special efforts should be made to ensure that the voters list is accurate and reliable in other words all eligible voters are listed only once, and eligible. There has been a growing consensus among election officials, scholars, and voting rights advocates that voter registration can be automated to take advantage of new information technologies, making the process more cost-effective, accurate, and efficient for government and voters. I have presented this article in the effort to sensitize stake holders of concerned organization on the need to decentralize voter registration and to make it continuous exercise. Nigeria is a very large country with fairly large population. If many of the eligible voter are not registered, they are automatically disfranchised. Credible voters register is a pre-requisite for a credible election and credible election to a large extent will guarantee good governance which is what has eluded the Nigerian government over the past decade. The recent development in the world of information technology has brought great change in the dynamic world. Information can be processes accurately, transmitted from any place to anywhere via the networks, data can be sparsely processed, managed and secured, etc. Here, we have proposed a distributed database model for continuous voters registration in Nigeria. The cases where distributed database system is implemented is presented, the state of current voter system in Nigeria is also presented and theoretical background of Distributed database system presented. A model for future continuous voter registration in Nigeria is proposed and the transaction and algebraic operation on the databases presented. Java has been suggested as the ideal language for the implementation of the system. If the management and control of voters register can be sparsely managed with embedded forensic application software in a network environment. Then the nation can have a reliable update of voters register.

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