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Creation of Central National Database in Nigeria: Challenges and Prospects

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Abstract

This paper focuses on the creation of central national database based on Entity Relationship (ER) data model in order to describe each person individually and uniquely. Also, the model establishes the use of the unique code (National Security code) as the primary key to identify each entity, entity relationship within and among public services entities. Presently, Nigeria is critically facing security challenges because people are not uniquely identified and tagged. The situation has led to insecurity in Nigeria with different trends and dimensions from one geopolitical zone to the other. For instance, this has led to various faceless activities such as Islamic sect called Boko Haram in the North, rampant armed robbery in the South-West, notorious robbery and kidnapping in the South-East and South-South. Corruption and unemployment are all over. To curb the menace, a central national residency database must be created to solving identity challenge, loose neighboring borders, sectional terrorist, corruption, Crime and criminalities, unemployment, poverty and leadership distrust. The paper recommends how the government can achieve central coordination of national security and attitudinal change of the country men despite the prevailing security challenge.

Key-words: Central National Database, Data, National Security code, Entity Relationship (ER), Utilities, Residency code, Enforcement, National security, Attitudinal change

JEL Classification: C82, M15, O32

1. Introduction

Presently, Nigeria is critically facing security challenges because people are not uniquely identified and tagged. The situation has led to insecurity in Nigeria with different trends and dimensions from one geopolitical zone to the other. For instance, this has led to various faceless activities such as religion sect called Boko Haram in the North, rampant armed robbery in the South-West, notorious robbery and kidnapping in the South-East and South-South. Corruption and unemployment are all over. To curb these menace, a central national residency database must be created to solving the security and identity challenge, loose neighboring borders, sectional terrorist, corruption, crime and criminalities, unemployment, poverty and leadership distrust. For instance, a national central database is needed when there is management multifarious "to reduce management complexicity" (wiki.answers.com). Therefore, the creation of a Central National Database in Nigeria is capable of leading to transformation in governance. The population of Nigeria in year 2011 was 162,470,737 as claimed by the World Bank (www.google.com/publicdata). As long as this population is growing without a classified data storage and retrieval mechanism about the people who reside in Nigeria, the possibility of incessant increase in 3Cs i.e. corruption, crime and criminality will continue to increase. Hence, the introduction of the Central National (Residency) Database in Nigeria to minimize the act of the 3Cs cannot be over emphasized. A database is a civilized way of keeping digitalized records about a place, thing or people. However, a National database is a similar data convergence of a nation or community people who share a common language, culture, ethnicity, descent or history. Data has been regarded as an important tool for development. There can be no development without data. Database is data trust. Therefore, data must have basis and kept in an organized manner. When similar data are convergence, database is established. National database is nation building. National database is also called Residency database. It is very sensitive and critical to national physical development and security. Nations are disintegrating from real world to virtual world seeking avatars' security capabilities to monitor and control decayed national security and threats. Therefore, according to Onakoya (2011) "a national database is an organised data or numerical environment where every citizen of a nation and the immigrants are uniquely identified and possesses a strong national virtual identity. National database may be population, identity, security, electorate, group or association's classified information or data of national interest". Also, Blunkett stated in

BBC News (2004) that, “the national identity would stop people using multiple identities and boost the fight against terrorism and organised crime”. In the same vein, Stevens in BBC News (2006) commented on the need for identity cards, said “they had benefits in tackling serious crimes, such as money laundering and identity theft.” However, the creation of central database is the basis for issuing national identity cards.

Central national database like any other project aims at solving problems. In Nigeria, there is critical national security challenges combined with how to fight corruption. Central national database is capable of solving these challenges. Therefore, the main objective of this paper is to create a holistic overhaul mechanism for anti-corruption, national identity and a central coordination of national security. So that, if residents pass through it, will ensure considerably security measure against corruption and national identification by so doing central security coordination would be greatly achieved. However, the database provides the following objectives: “to create a holistic overhaul mechanism and procedure to solving insecurity issues; create a central coordination of national security; create a forum for security information sharing, exchange of ideas and collaborative efforts among the allied security operative in Nigeria; fight corruption in government and promote attitudinal change of residents towards public resources and utility; create and assign national security number to all Nigerians at home and abroad including the immigrants; monitor all neighbouring borders and port-of-entry security; provide data knowledge for driven the economy and development; eradicate manipulations of government resources by some unscrupulous civil service officers; generates employment; reduce cost of running government; set standards for cyber law; cashless banking protection and security policies” (Onakoya, 2011).

National database is a digital solution to insecurity of a nation and that should be seen as critical national issue that attracts collective responsibility. Therefore, it must be a creation of law. Going by the experience of best practices such as the United States of America, United Kingdom, Germany, China, Kenya and South Africa these nations have recorded the following tremendously proving achievements due to the creation of central national database i.e. minimal level of corruption and sanity of governance, security surveillance, knowledge and data driven society, social security and welfare, data for national growth and development, immigrants control, personality integrity track and electoral value. Also, control of cyber fraud, sharp practices in the e-commerce or cashless banking and therefore, reduces the cost of running government. Central national database helps statistical planning and realistic budget. For instance, central national database is capable of presenting residents in statistical group class such as stating the numbers of infants, grow-ups, adolescences, working class and old age in the country for the provision, allocation and performance of realistic budget. Put briefly, the overall effects of all these factors is total attitudinal change in governance and among civil liberty societies.

Recently, Transparency International perceived that Nigeria is number thirty-five (35) most corrupt nation (Transparency International). This corruption perception index can only be condemned by creating a central national database of this nature. Again, corruption in governance is another factor that ruins security in Nigeria and it has subjected the nation to state of insecurity. This security challenge is growing fast due to inability to identify people and establish universally acceptable identity. Central national database will arrest this situation and assign universally accepted identity to all residents in Nigeria. Also, the use of this identity serves as a holistic anti-corruption measure and will fight insecurity in the country. Consequently, reform the attitude of the country men by its enforcement policy backed-up by legislation. Note that, central national database and the registration certificate is stronger than just ID card as supported by Manningham-Buller (2005) stated that ID cards would in fact disrupt the activities of terrorists, noting that significant numbers of terrorists take advantage of the weaknesses of current identification methods to assist their activities. For greater security achievement, It has also been pointed out that "one lesson to be drawn from historical experience is that universal registers of personal information are held to be solutions to moral panics, but in operation they are very rarely as effective as their proponents hope" (Agar, 2005).

The scope of this study propose the creation of a communications channel for dissemination of information and feedback for the successful implementation of the project, application designs and development should be based on entity-relationship data model schema and that, the system must capture the detail attributes of all the residents in Nigeria and issued them National Security Code (NS Code) in a classified residency categorisation manner, writing of standards, policy and enforcement, setting up of administrative offices and other integrated offices such as critical MDAs and port-of-entries. Finally, the scope proposes established institution of database academy for specific capacity building, detailed training and workshop for all stakeholders. However, apart from the introductory Section, Section 2 examines the historic concept of central database. Section 3 discusses the methodology and design for the study. Section 4 and 5 presents the data analysis and conclusion, respectively.

2. Brief Historic Concept

During the period of ignorance, efforts were being made to store information and data in manual database systems. Since then, information and data were developed and stored by the government offices, libraries, hospitals and business empires. According to http://wikipedia.com, in 1960, information and data storage took another dimension by the international business machine (IBM)'s introduction of SABRE computerized database to assist the American Airlines to manage their reservations booking. SABRE Airline solution was a commercially successful database. The predominant data models at that period was a network model called CODASYL (i.e. an acronym for a consortium- "Conference on a Database Language") and another hierarchical model called IMS (i.e. Information Management System – is a database and transaction management system). Those data models reigned through 1960 to 1970.

In the 70s, two major relational dataset systems were created. These were the INGRES and SYSTEM R. Ingres was introduced by uniform building code (UBC) and system R also, introduced by International Business Machines (IBM) between 1974 and 1977 respectively.

Ingres used QUEL (i.e. Query Language) and led to the creation of many systems such as Ingres Corporation, Ms SQL server, Sybase, Wang's PACE and Brifton – Lee. Meanwhile, system R used SEQUEL (i.e. structured English query language – design to manipulate and retrieve data stored in IBM quasi – relational database management system, system – R) led to the development of SQL/Ds. DB2 Allbase, Oracle and non – stop SQL. During that period, Relational Database Management became rampant and recognized.

In 1976, another new database model was introduced by P. Chen called Entity - Relationship (ER). The model is flexible and data application proof than to logical table structure. The idea is the advent of structured query language (SQL) in 1980 and that has become standard and stable query language up till today.

In the 80s, SQL became standard query Language and brought about many database companies and products such as Dbase III and IV, Watcom SQL, PARADOX, RBASE 5000, OS/2 Database manager and RIM. In 1990, there was a database industry shakeout where most database industry sold database products at exorbitant prices. That was what out broke the invention of client tools for application development (i.e. developer's application packages) such as oracle developer, visual FoxPro, visual basic (VB), PowerBuilder and others. Another tool for office/personal productivity such as object database management system (DBC), Excel, Access was also developed.

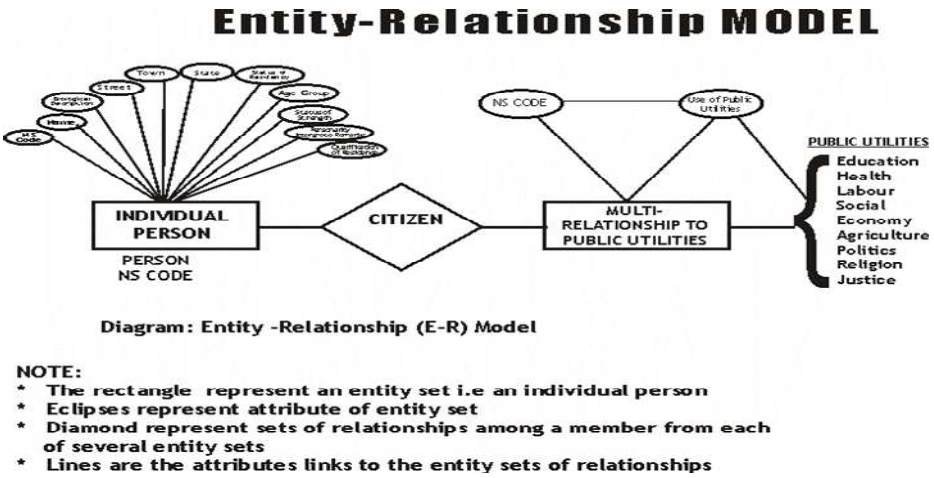
In the late 90s spanning to the year 2000s, there was a huge investment in the online business and the need for internet database / content web page (i.e. dynamic web pages) arose. Web database tools such as front page, active server pages, Java Servelets, Dream Weaver, cold fusion, Enterprise Java Beans and oracle developer 2000 were introduced. These innovations saw the advent of open source technology to the internet and other system like common gateway interface (CGI), GNU Compiler Collection (GCC), MySQL, Apache, and point – of – sale solutions. As the internet technology continues to grow from height to height, new interactive applications solutions are developed for Personal Digital Assistance (PDA), point-of-sale (POS) and Automatic Teller Machine (ATM) transactions.

Presently, the three major database companies in the world are Microsoft, IBM and Oracle.

3. Methodology and Design

We have critically examined numerous database models and how Entity-Relationship model is used to create a large central database. The most suitable database model is Entity-Relationship model. Therefore, we have modified and extended Entity Relationship data model to include utility (i.e. Public Service) and used as a method for achieving the data capturing and transaction in a typical central national database and attention was drawn to data retrieval, storage, modification efficiency and relationships are based on one-to-many and many-to-many as occasion demand in the use of Relational data model methodology in the central national database. Essentially, modeling data is paramount in Entity Relationship Model. According to Codd (1960) in his research work "A Relational model of Data for Large Sheared Database" he described relational model as concept of a Table. He also, identified records in the table as horizontal rows i.e. tuples and fields as vertical columns i.e. attributes. This was later expanded to Entity Relationship analysis by Hawryszkiewycz (1989) in Rajaraman (2008) where the analysis is used to organise data as relations, normalizing relations and obtaining a relational database. The entity-relationship approach initially proposed by Chen (1976), although modified and extended by others, still remains the premier model for conceptual design as ascertained by Teorey et. al (1986) Furthermore, according to Rajaraman (2008) Entity Relationship model for data uses three features to describe data. "These are Entity, Relationship and Attributes. Entities are which specify distinct real world items in an

application. Relationships are which connect entities and represent meaningful dependencies between them. Attributes are which specify properties of entities and relationships." Utilities are the data transaction among the entities. This model is applied to create the Central National Database in Nigeria to meet the peculiar security situation and fight corruption as shown below:



Source: Abraham et. al. (2006) and modified and extended by the Author

Figure 1: Entity-Relationship model

NOTE: The above figure describe the relationship between one person and multi-activities in the society.

In the Entity-Relationship model, Data management is data mining and retrieval. The data mining and retrieval technique is object-relational data model where each entity is modular. Because of the versatility and subsidiaries of the national database, therefore, transaction files are the public utility's interfaces. The database application must provide a universal front-end (link) to the database without loss of continuity in the query time. And its up-time hour must be 99.9% and 24/7. For security reasons, it must be on secured platform and the network architecture must use the internet and virtual private network respectively. Consequently, central national database should be able to expose and enhance originality of information and trace to the master file during conflict or distribution management. Therefore, education and re-orientation must be impacted on all residents on how to keep and use their national security code (NS code). NS code is often called social security number. It is a proof of residence or nationalization. We propose two types of NS code:- NS Code–citizen and NS Code–immigrant. **NS code-citizen (NSCC)** means national security number for the Nigerians by birth or parent(s) by birth or nationalized citizen. **NS code-immigrant (NSCI)** means national security number for the legal immigrant. These are codes for the foreigners denoting their country of origin.

National database is a dynamic and intelligent data records system. It contains detailed particulars of classified information, resident citizen, the Diaspora and the foreigners including their biometrics and passport photograph. Usually, it is adequately prepared on relational database conceptuality and expansive data administration and management. National database is a centralized system, typically multi-user and distributed information systems based on hypertext with web interfaces to the central database." There is no way we can implement a database without a particular data concept. Data has been described as pertinent tools for development. Data are collected, captured, processed and produced as a finished result. Data may be valuable, quality or quantity. Without data there can be no development. Data is the property of development. When data is analysed, enumerated, investigated, exposed situations and circumstances or statistically presented, data is adequately planned. In database, data storage is represented by rows or columns. Data stored in columns are Hierarchical database. While, those data stored in rows are Relational database. Naturally, Residency database is a central national database created to solving numerous issues. Based on that, it has to be archival and expansive in nature, must be adequately prepared and data related.

4. Discussion: Challenges and Prospects of Central National Database

There is no gain in discussing advantages and challenges of central national database without knowing the environment. What are the core components of database environment? Usually, a typical database be it central

national database or certain group of interest's database must comprises of four fundamental elements i.e. Data, Hardware, Users and Software. When these components integrated, they tend to build a database environment. Data is processed information. Hardware is the equipment, server or devices connected to run the software. Software is an idea or set of instruction that operates a computer machine to accomplish a specific task. Users are the specific software user/department.

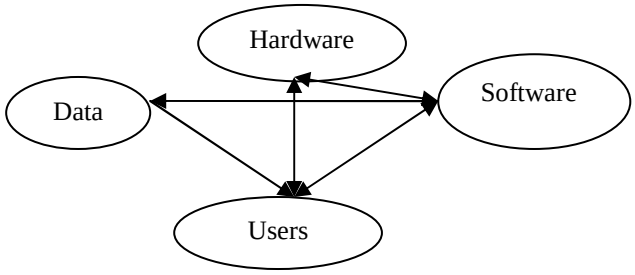


Figure 2: Component of Database environments

NOTE: Figure 2 above shows how database components interacted to form a database system or environment. The arrows are the directions of interactive actions from one environment to the other.

The components of database environment comprises of "DATA: data is integrated and shared by many users. A database is a representation of a collection of related data. Underlying principles: hierarchical, network, relational or semantic. SOFTWARE: the components of a database management system: data definition and data manipulation. USERS: application programmers, non-computer science expert and experienced user. HARDWARE: consequences for the architecture of database system development: time sharing, file server and client/server" (See http://wiki.answers.com/Q/what are the components in database environment). In the course of these components interaction, there are challenges and proven prospects. They include:

4.1. Corruption

Corruption has eating deep in the society and the only way to curb it is to create a holistic mechanism for anti-corruption. However, the creation of central national database with use of a unique attribute to identify people in Nigeria is an anti-corruption measure. This will go a long way in reducing diverse corruption activities in public service and private life. Therefore, Government can achieve the required set goal(s) on certain policy. For example, Nigeria Housing Scheme Policy proposes house for all. Without an organised data for appropriate distribution of houses, house can not be for all because some unscrupulous entity may fraudulently acquire multiple identities to obtain numerous houses while others may not possess any at all. Whereas, the government policy is one man, one house, for it to go round. Also, people who have been convicted in any part of the nation, may not be identified unless he is a popular figure in the society such an ex-convict may not be recognised during politicking or any other sort of public transaction that excludes ex-convict. Whereas central national database will monitor personality integrity so that convicted person can be seen as an ex-convict not only in Nigeria but anywhere in the World. In the same vein, a car bought and registered in Sokoto State committed crime in Rivers State may be difficult to trace presently but it will not be difficult to trace in the regime of central national database. So, such findings may be generationally traced possible i.e. it can be easily trace from multi-owners to the present owner. Abraham et. al. (2006) pointed out "the need for unique identifier in case of possibility of two customers with the same name, street address and City". He recommended that, a unique customer identifier must be assigned to each customer. Also, he gave illustration of United States of America, where many enterprises use the social-security number of a person (a unique number the US Government assigns to every person in the United State) as customer identifier. That has remained a powerful investigative tool for US government. In a similar vein, Data collection and security management in Central National Database is critically based on primary key i.e. unique numerical identification where each resident refer to as an entity. As a result of that, there can be mistaken identity. Entity's contents (i.e. records of individual) are captured and stored in a master file sequentially in order of NS code and state of residence. Conventionally, primary key is a record pointer. Agar (2005) had recognized that "a unique identifier is needed as a primary key for the database". Primary key here is the national security number (NS code). However, this unique identifier should remain the legitimate identity in transaction of any sort in the private and public services. To realize that,

data capturing may be cumbersome therefore, special attention, funds, work free days and public registration days must be declared by the Federal government for the registration exercise.

4.2. Security and Empowerment

The Security in this nation is at insignificant level of Social reforms. To some extent, people are no longer feel free and secured in going about their daily activities in the name of threats to personal security in this country most especially, in the North-East for Boko Haram sect nefarious activities, South-West for armed robbery, South-East and South-South for rampant Kidnapping and notorious robbery. All these menace will be deficient with the creation of central national database. The use of the NS Code as official identifier and the universal interface extended to allied securities in Nigeria for verification issues will indirectly wage war against indiscipline, in-orderliness and insecurity. Orderliness shall be automatically inculcated in the minds of all residents. Direct and accurate resource allocation and provision for National Budget shall be based on the Central National Database (ND) data and statistics. Also, it will greatly assist the government in contemporary strategy and policy analysis.

The creation of central national database will bring about Education and Employment entrance reforms i.e. admission into all Nigerian tertiary & other levels of education shall be based on providing resident's National database certificate of registration or permit in-addition to academic qualifications. Also, employment shall be based on providing National database certificate of registration or permit in-addition to academic qualifications. In the same vein, National database certificate of registration and permits shall be required to access other public services and as gatepass at all the port-of-entries in Nigeria.

In Nigeria, unemployed, rural dwellers among other find it difficult in assessing Bank facilities because they lack collateral. This situation has greatly contributed to the collapse of cottage industries and agro-allied business which has drastic effect on the country's gross domestic product (GDP). The central national database certificate of registration can be improvise as security deposit i.e. collateral "in-addition to the lien on all the acquired equipment, plant and machinery invested which shall be revert back to the beneficiary immediately the credit is liquidated" (NEFUND). This will largely empower the active poor and self-engaged the unemployed team of youths. Thereby, reduce unemployment and insecurity greatly.

4.3. Decayed Infrastructure: Power Supply and Communications Synergy

Epileptic or erratic power supply is another major problem but of recent, we have noticed boost in electricity supply for example, it has increased to 4,500mw from 3,200mw in 2011. Therefore, Government should not relent on her efforts to increase electricity supply. In the alternative, solar powered telecoms network can be encouraged to reach more people in the rural area. Access to broadband is still luxury; government should make the "access to broadband becomes legal right" (Daily Trust, 2010). Computers, internet and network facilities must be declared as tax holiday imported goods for certain years by the Federal Government to make it cheap and affordable for all in order to enhance a conducive environment for the stability of the technology. It is hereby recommended that internet facilities and alternative means of power supply must be provided in schools, hospitals, Police stations and other allied security agents offices, Local Government Secretariats, airports and other ports-of-entries, embassies in Nigeria and Nigeria embassies in diaspora, railway stations, malls, home and offices. Government can engage the Public-Private-Partnerships to provide these facilities.

4.4. Capacity building and regulatory body

There is shortage of ICT manpower in the country and presently there is no Government training institute for the database experts in the country. To promote capacity building, Capacity building and regulatory body must be established to encourage continuity and sustainability of the brilliant idea because it is important that central national database "must have high storage space and a great Database Administrator (DBA) to handle it." However, the regulatory body will be charged with the duty of regulating the creation of database and websites in the country. Cyber constrains and recommendations must be articulated for the purpose of rule of law. Legislative should embedded in law the use of NS code, for Judiciary and Law enforcement agents to enforce the application and personalise the use of the national security codes within the government, between and among residents in Nigeria and the global environment.

4.5. Computer education and Information dissemination system

Low level of computer education might be an envisaged challenge. This can only be eradicated by inclusion of **e-commerce and the practice** subject in the curriculum of schools ranging from primary, junior and senior secondary schools through tertiary institutions and other professional examinations to expand the level of

computer education in Nigeria so that, the use of ICT will be meaningful. For example, DAAR SAT Communications Plc Education Project Initiative of the Federal Ministry of Education on Public-Private-Partnership (PPP) arrangement to provide ICT facilities and training to help Government efforts, students and complements the efforts of the teachers in schools in all local governments in Nigeria is a welcome development. We have identified that there is a communication gap between the Government and the citizens. To close this gap, an information dissemination system that is flexible and wider in coverage hub on local government, community and religious leaders were proposed for the successful implementation for dissemination of information about the central national database.

5. Conclusion and Future Work

The only way to sustain this transformation agenda especially National security and attitudinal change in Nigeria is to create a Central National Database and issue all residents in Nigeria with National Security Codes (NS Code) including the inmates, immigrants and the diaspora. Furthermore, the National Security Code must be an official identifier in the country and must be quoted. In essence, all the present decentralised database of various interests and MDAs must be upgraded to include NS code attribute so that, entity can be clearly identified between or within and among their relationship with the public. Central national database and its associated security apparatus is the only tool that can minimise security crises in the country. "*We have no better security option than to change the attitude of our country men*." Also, We have established that "*Government is the security agent while all of us (citizen) are the security guards."* We have no doubt in our mind that if Central National Database is managed as prescribed, security will be greatly achieved in Nigeria. Also, ECOWAS community can legislate to explore and implement this research work to enhance security among the union and thereby create a fraud free trade zone in sub-Sahara of West Africa.

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