# Distributed System for Population Analysis in Nigeria (National Population Commission)

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## ABSTRACT

This research designed a Distributed System for Population Analysis that can carry out census operations, because of its relevance to the society. We identify the problems hindering the effectiveness of the existing system and to make recommendation based on findings for improvement. Meanwhile, the researcher in order to solve the problems of unstable policy and inadequate manpower in the manual system, a proper System Analysis and Design Methodology was adopted and explained. The high-level model of the proposed system was also designed and displayed in a format easily understandable to the user. The high-level model of the proposed system was designed architecturally and detailed designed through its separate components. There were three essential modules each taking care of specific function like: the enumerator, the system admin, and the registration modules. Recommendations are also made available to both the organization and the government. Suggestion for further studies on ways of improving population census in the county.

(Key words: population, system, HTML, PHP, My SQL, National Population Commission)

## INTRODUCTION

Population census is the most detailed information source on the population at the level of small localities, neighborhoods in cities and small groups in the population. The data collected during census forms a basis of information that is available to public and private sectors, at the national state and local level, for the purpose of decision-making in various areas of life. According to Robert (2012), "Just like we cannot survive without roads and bridges, the country does not function well without an updated census to distribute funds to areas that most need them and to support community decisions and their own future." The increasing complexity of modern life means a greater need to plan housing, schools, roads, transportation, and a vast range of social and economic requirement for the nation. This cannot be done without a detailed count of the population. Census is officially managed by some organizations or government, for example in Nigeria, the National Population Commission (NPC).

The installation of computers in these organizations or bodies that manages census information will assist not only in the fast-recording information but also in solving certain problems, which cannot be easily resolved manually. The human resources of any enterprises are their most valuable assets and if properly used and are well motivated, they can perform their assigned tasks in such a manner as to enhance the enterprises goals and objectives.

Therefore, adequate population records will provide all the necessary information that is associated with people, which include the size of the population, age structure, educational attainment, labor force and socio-economic characteristics, unlike in the manual method which makes access to data and information very tedious. The integration of different databases so that these databases can be merged and processed together prompted the researchers to develop software for this organization, National Population Commission (NPC).

Census undertaking in Nigeria can be traced to as far back as 1966 after the colonization of Lagos by the British. Since then, there have been

several exercises to count Nigerian population. However, these censuses are characterized by some problems and deliberate intimidating attempts to inflate population figures; just in favor of one geopolitical zone or the other (Ebigbola, 1983). This cannot represent the nations' image as regards to human population. As a result of this, the NPC was established using the Decree No. 23 of 1989. The reason behind this was to have a successful census each time and as well accurate demographic data. It is no doubt that this Commission was vested with a lot of powers and functions some of which are:

i. Advising the president on the population matters, for effective disbursement of project.
ii. Appointment and training of the enumerators or other staffs of the commission.
iii. Publish and provide information data on population for the purpose of facilitating economic and developmental planning.
iv. To undertake the periodic enumeration of the nations' population through census, sample surveys or otherwise.
v. To establish and maintain the machinery for continuous and universal registration of births and deaths throughout the federation.
vi. To collect, collate and publish data on migration statistics (NPC, 2017).
vii. To reach and monitor national population policy and set up national population information data bank.

Several problems have been identified with the existing system in the NPC, some of which include poor organization, unstable policy, and inadequate manpower in the manual system and maintenance in the case of standalone system. The study developed a Distributed System for Population Analysis in Nigeria with the objectives:

i. To develop and implement an interface for the front-end that could be used to collect data/information using HTML.
ii. To develop and implement a database for the back-end using PHP and My SQL.

The development of new system, will solve problem associated with the obtainment, storage, and retrieval of information on human population. A timely retrieval of information is anticipated with efficiency and reliability. It will provide security to unauthorized data and fraud will be minimized in the society which will lead to improvement in administration processes.

This study is limited on how Distributed System can substitute traditional manual systems in analyzing, enumerating and conducting human population census in Nigeria.

## Processes Involved in Census Operation

The need for population data cannot be over emphasized in an economy because these human populations generate, sustain and enjoy the socioeconomic development in a region. In population geography, data comes in various forms such as (i) quantitative data (They are data expressed as numbers examples: weight, height, total population, etc.), and (ii) qualitative data which refers to categorized /non-numeric data such as sex (male or female), social status (rich or poor) etc. These data can be got from different sources which include:

## Population Census

The United Nations defines census as total process of collecting, compiling, evaluating, analyzing, and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or in a well delimited part of a country (United Nations, 1998). This is done usually within the interval of 10 years. Some information obtained from census records include age, sex, marital status, size of the population, religion, education, place of birth, etc. They are two approaches to carrying out a population census:

i. *De jure approach:* This is done by counting and obtaining information from individuals at their places of residence during census.
ii. *De facto approach:* Here wherever the individual happens to be at the census period, is where he will be counted and information obtained regardless of his place of residence or abode.

## The Registration System

This is the continuous universal recording of the information about a population in a particular area into designated registers. These registers help in analyzing changes in population, denoting the change direction and the amount of change that transpired. Examples of such registers are:

***Vital registration*** contains the vital demographic events happening in the life of individuals throughout their life span. Some of the vital demographic events includes birth, marriage, death, dissolution of marriage, etc.

***Migration Records*** Travelling points like sea ports, airports, border post, serves as a collection site for information regarding movements of individuals in or out of a country.

***Population Registers*** is kept by the population commission as they make entries of individuals bio-data, starting from their birth throughout his life span to his death. These registers contain social, demographic and economic data about the individual.

## Population Projection

Policy makers and program planners rely on population projections to assess future demand for resources such as food, water, and energy, as well as services such as health and education. (Toshiko and Jason, 2014) Opined that population projections alert policymakers and planners to major trends that may affect social and economic development and help them craft appropriate policies and programs. Many governments periodically make population projections for their own countries. In addition, organizations like the United Nations Population Division (UNPD) and the U.S. Census Bureau regularly prepare population projections for the world, regions, and individual countries. To develop these projections, demographers must make assumptions about future trends related to fertility, mortality, and migration.

These assumptions, though based on research and expert opinions, are not certain. Population projections represent the future size of a population and the age and sex distribution if the assumptions used hold true. Many users of projections, however, may not be aware of exactly how they are made and do not consider the assumptions and limitations that underlie them. It is essential that users have a basic understanding of these assumptions and their plausibility before using them.

Uncertainty projections can result from a variety of sources, such as in the estimate of a current population size that serves as the "starting" population for projections. Time also increases uncertainty: Projections over longer periods are less certain than short-term projections because of the compounding effects of inaccuracies in assumptions over time. This brief aims to improve understanding of population projections by highlighting some of the key assumptions on which they are based.

**Table 1:** Nigeria Population Projection (Worldometers, 2015).

| Year | Population | Yearly % Change | Yearly Change | Migrants (net) | Median Age | Fertility Rate | Density (P/Km²) | Urban Pop % | Urban Population | Country's Share of World Pop | World Population | Nigeria Global Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2020 | 206,152,701 | 2.62 % | 4,994,191 | -60,000 | 18.1 | 5.42 | 226 | 52.7 % | 108,711,170 | 2.64 % | 7,795,482,309 | 7 |
| 2025 | 233,691,888 | 2.54 % | 5,507,837 | -60,000 | 18.5 | 5.08 | 257 | 56.7 % | 132,547,150 | 2.85 % | 8,185,613,757 | 5 |
| 2030 | 264,067,527 | 2.47 % | 6,075,128 | -60,000 | 19.2 | 4.74 | 290 | 60.3 % | 159,240,806 | 3.09 % | 8,551,198,644 | 5 |
| 2035 | 297,323,173 | 2.40 % | 6,651,129 | -60,000 | 19.9 | 4.41 | 326 | 63.4 % | 188,612,714 | 3.34 % | 8,892,701,940 | 5 |
| 2040 | 333,172,092 | 2.30 % | 7,169,784 | -60,000 | 20.7 | 4.10 | 366 | 66.3 % | 220,824,256 | 3.62 % | 9,210,337,004 | 4 |
| 2045 | 371,119,359 | 2.18 % | 7,589,453 | -60,000 | 21.5 | 3.81 | 407 | 69.1 % | 256,584,400 | 3.90 % | 9,504,209,572 | 4 |
| 2050 | 410,637,868 | 2.04 % | 7,903,702 | -60,000 | 22.4 | 3.55 | 451 | 72.0 % | 295,479,827 | 4.20 % | 9,771,822,753 | 3 |

## Components of Population Projection

The components of population dynamics can be classified into fertility, mortality, and migration (Haupt, et al., 2011). However, each brings about the population change.

***Fertility:*** Fertility refers to the number of live births women have. It differs from fecundity, which refers to the physiological capability of women to reproduce. Fertility is directly determined by a number of factors which, in turn, are affected by a great many factors which can be social, cultural, environmental, health and economic in nature. These social, cultural etc. factors operate through four major variables which are:

i.   Proportion of women in sexual unions.
ii.  Percentage of women using contraception.
iii. Proportion of women who are not currently fecund (primarily because of breastfeeding).
iv.  Level of induced abortion.

Knowledge of these four variables provides clues to potential changes in fertility and aids our understanding of past change. (Stein, 2011) For instance, the proportion of women who are in union is affected by other demographic factors including the age at first marriage or union; the pervasiveness of marriage and other unions; rates of divorce, separation, and remarriage; and male mortality levels. In addition, the percentage of women in married or in union and the percentage of women in sexual unions are sometimes approximated by the percentage of women of reproductive age who are legally married. Some measures of fertility include crude birth rate, total fertility rate, and general fertility rate.

***Mortality:*** Mortality refers to cessation of life or death of an individual or groups of individuals in any population at any given time. The probability of dying during a given time period is linked to many factors, such as age, sex, race, occupation, and economic status. Also, the incidence of death can reveal much about a population's standard of living and health care. (Cochrane, Leger, and Moore, 2011). Some measures of mortality include death rate and age specific death rate.

***Death Rate (DR):*** The death rate is the number of deaths per 1,000 population in that population in a given year. (World Bank Group, 2016) We calculate the DR as follows:

$$DR = \frac{Number\ of\ deaths}{Total\ mid-year\ population} * k$$

Where K = 1000

The death rate can be particularly affected by age structure. It is therefore prudent, when comparing death rates between countries, to adjust for differences in age composition before making inferences about a country's health, economic, or environmental conditions. For example, In 2006 Nigeria's death rate was 12.7 per 1000 and had grown to 12.9 in 2014. Similarly in 2009, Sweden's death rate was twice as high as Panama's 10 per 1,000 compared with 5 per 1,000 despite the fact that life expectancy in Sweden was 81 years, compared with 76 for Panama. The higher Swedish rate is attributable to the differences in age composition between the two countries. In "old" Sweden, 18 percent of its population is ages 65 and older, so deaths are more likely to occur, while "young" Panama's proportion of elderly people is only 6 percent of the total population. Thus, despite Sweden's better health conditions, it has a higher proportion of deaths in the total population each year than Panama.

***Migration:*** According to World Bank's Migration and Remittances Factbook (2011), migration is the geographic movement of people across an administrative boundary for the purpose of establishing a new permanent or semi-permanent residence. The determinants of migration have been classified into "push" and "pull" factors. While the pull factors drive people away from an area, the pull factors attract people to an area (Ajaero and Onokala, 2013). However, what constitutes a push factor from a migrant's place of origin (where the migrant is moving away from) can also be a pull factor in a migrant's place of destination (where the migrant is moving into). Together with fertility and mortality, migration remains an important component of population change. The terms "immigration" and "emigration" are used to refer to moves "into" and "out of" countries (international migration). On the other hand, the terms "in-migration" and "out-migration" are used for movement "into" and "out of" areas within a country (internal migration). Some measures of migration include:

**Immigration Rate:** The immigration rate is the number of immigrants arriving at a destination

per 1,000 population at that destination in a given period.

**Emigration Rate:** This is the number of emigrants departing an area of origin per 1,000 population at that area of origin in a given year.

**Net Migration Rate**: The net migration rate shows the net effect of immigration and emigration on an area's population, expressed as an increase or decrease per 1,000 population of the area in a given year.

According to The World Bank's *Migration and Remittances Factbook* (2011) the percentage of international migrants worldwide increased by 33% with 59% of migrants targeting developed regions in 2013. Almost half of these migrants are women, which is one of the most significant migrant-pattern changes in the last half century. Women migrate alone or with their family members and community. Even though female migration is largely viewed as associational rather than independent migration, emerging studies argue complex and manifold reasons for this.

## METHODOLOGY

### Present Procedure

The analysis of a given system could be defined as examining the given system's part and relationships. The present procedure can easily be seen in the organization's structure or hierarchical order. Consequently, the researchers had the opportunity to look into the activities of the commission and observed that though many people claim that they use computer in their offices, still a lot of manual work are being done in the commission as files are kept physically. Below are the procedures or the functions and activities of the Commission.

*Enumerator:* The Enumerator has to go from house-to-house interviewing respondents based on the questionnaire given to them. The Enumerator also performs the following:

- Check the boundary and map of the enumeration area and ensures that the boundaries coincide with the adjoining enumeration that no area is left in between the enumeration areas and no adjoining enumeration areas overlap.

- Acquaint himself with fully and partially occupied building in the area, numbered the buildings and households in the buildings.

- Establish a necessary report with the households head and members, this will enable him enumerate successfully all the households within the area.

*Supervisor:* The supervisor oversees the affairs of the enumerators and supply materials to them (if needed) and visits the supervisory areas before the commencement of the census. Also, he intimates the chiefs about the exercise and solicits their supports during the exercise. The supervisor in turn reports to the controller for urgent attention as the case may be.

*Controller:* The controller heads the state office of the National Population Commission (NPC) and oversees the enumeration exercise in the state. He would after the exercise report directly to the commissioner.

### Information Flow

Information flow represents how information produced by the Commission goes into the Commission. The information/data collected at the local level by the Enumerators under the supervision of the supervisors goes through the Controllers. The Commissioners will then collect those data which must have passed through the Director-General and send them to the Commission at the national level. These data will in turn be released from the Commission at the national level to the public. The organization produces the following information:

i. Epidemics i.e., outbreak of diseases, for instance, HIV/AIDS.
ii. Rate of population growth, mortality, migration, birth, etc.
iii. Natural disasters caused by population density.

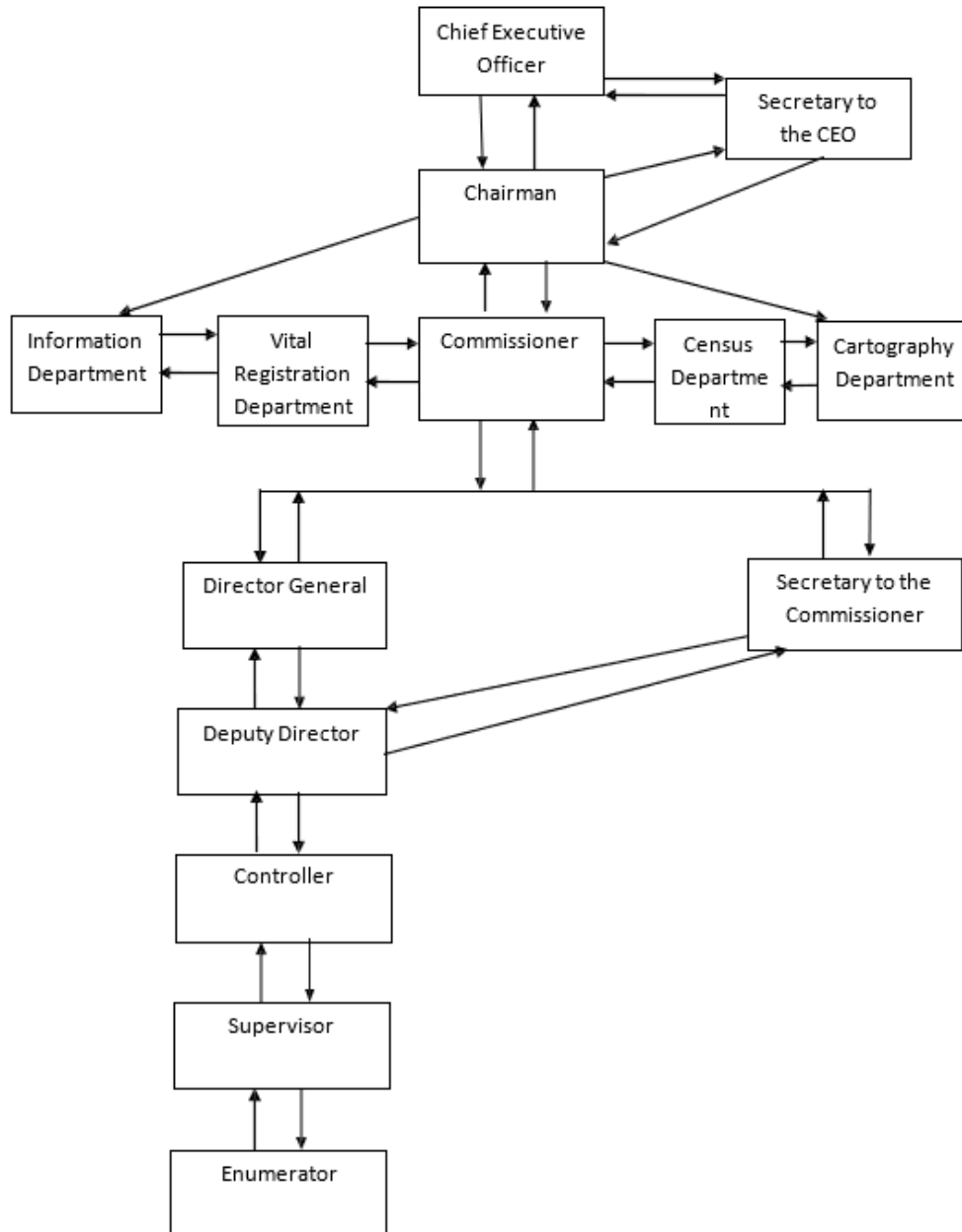Below represents the information flow chart of the Commission.

**Figure 1:** Information Flow Chart.

## Identified Flaws in the Present System

In Nigeria, census is conducted by identifying the houses (i.e., dwelling places and places that are usually used for living like sheds that are used by nomads). This is the first step, then the enumerator prepares the house list. Once the house list is prepared, the enumerator prepares sketches of blocks of houses that give the primary information about the type of houses

and facilities that are being enjoyed by the population in that area, the house list acts as the framework for the next step of enumeration.

Enumerator reports to supervisor and supervisor reports to the charge officer and charge officer reports to the area officer, area officer reports to zonal officer and zonal officer reports to state commissioner. The state commissioner reports to the Chairman National

Population Commission of Nigeria. The above system is a very traditional method and involves many difficulties. The description above shows that:

- The system is time consuming.
- The system is vulnerable to data loss.
- The system is susceptible to data redundancy.
- It is prone to cost ineffectiveness.
- Information leakage is possible in the system.
- Lack of timely access to a particular information is also featured.

## New System and its Justification

The advancement in the Distributed System, technology has globally transformed the traditional ways of accomplishing tasks, it presents to the world the easiest life such as e-shopping, e-health, e-books, e-banking and so on. A System is a web based which allows respondents to complete the census form via the internet. By being online it means information is available anytime to anyone with access. It is also user friendly and widely accessible across the world. Nowadays, in this fast world of technology, it is very important to complete a work in a speedy manner, this and other correctable flaws of the existing systems are the objectives of the proposed system. This is made possible by adopting population analysis system using web technology.

## Justification for the Proposed System

It is the purpose of the new system to address all the problems plaguing the present system, this system will do the analysis and store the information either automatically or interactively. The proposed system demands security for confidentiality, integrity and availability, this proposed system satisfies various security requirements such as verifiability, accuracy, uniqueness, and fingerprints in order to eliminate redundancy and duplication. This bright plan will complement the effort of the Nigerian Government to make or inform decisions for policy and planning, the obtained census data is commonly used for research, business, marketing, national budget and preparing for future.

It will make use of PHP and MySQL. This will be like this: A report is generated conforming to information needed by the management via the monitor, this will require the input of necessary data and then a report is generated. The proposed system is further justified with the following:

i. Accurate data/information management.
ii. The volume of paperwork will be greatly reduced.
iii. Fast rate of operation as in accessing information.
iv. Flexibility (i.e., information can be accessed or modified at any time).
v. Easy way to back up or duplicating data in CD's in case of data loss.
vi. Better storage and faster retrieval system.
vii. Zero or minimal report's error.
viii. Scalability (expandable to accommodate future need).
ix. Manageable space

## Flowchart of the New System

The flowchart is a pictorial representation of the sequence of operations in a process, therefore; the flowchart of this system could be defined as the diagrammatic representation of how a process is completed in the system as seen in Figure 2.

## Use Case Analysis of the System

Use cases are used to explain and document the interaction that is required between the user and the system to accomplish the user's task. Use cases are created to help the development team understand more fully the steps that are involved in accomplishing the user's goals. A *use case* represents how a system interacts with its environment by illustrating the activities that are performed by the users of the system and the system's responses. The goal is to create a set of use cases that describe all the tasks that Users need to perform with the system. Use cases can vary considerably from one organization to another in terms of the content included, the format followed, and the degree of formality employed.
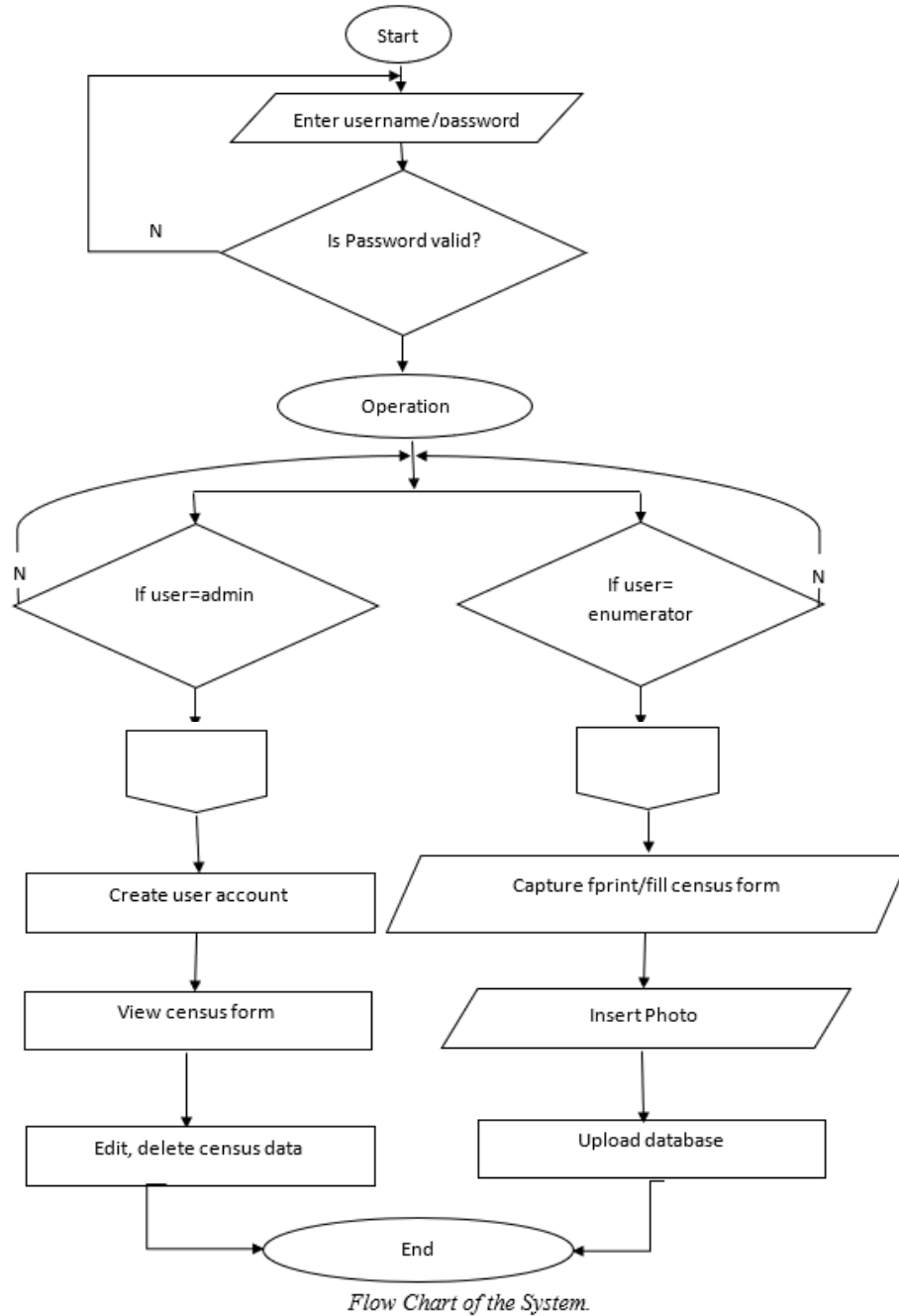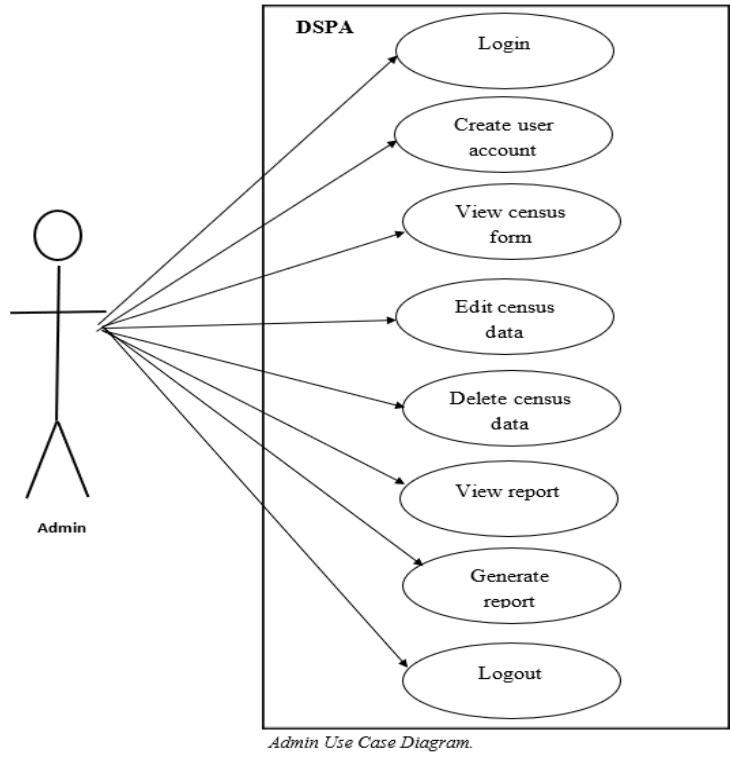
*Flow Chart of the System.*

**Figure 2:** Flow Chart of the New System.

## Use Case Analysis of the System

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*Admin Use Case Diagram.*

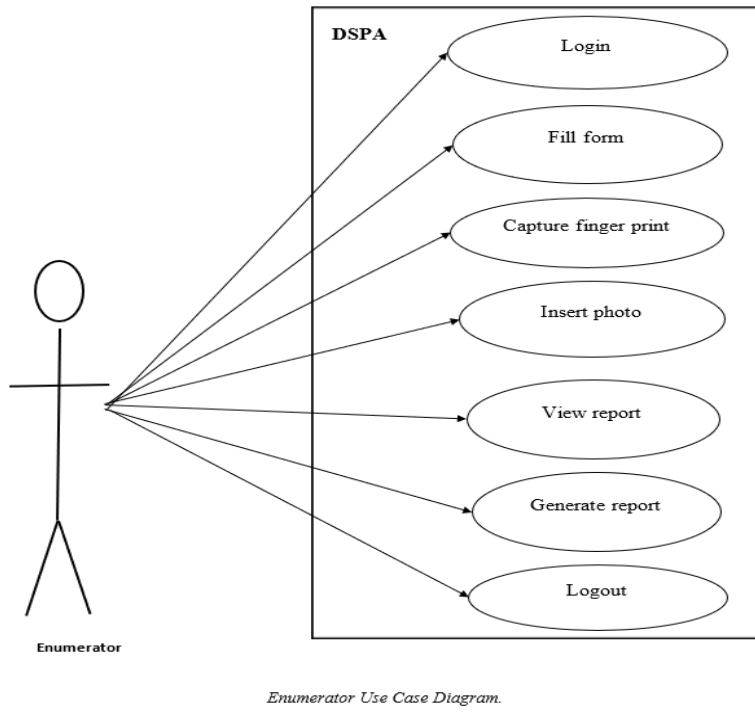**Figure 3a:** Admin Use Case Diagram.



*Enumerator Use Case Diagram.*

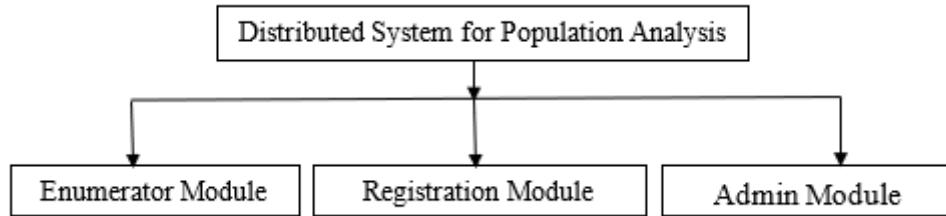**Figure 3b:** Enumerator Use Case Diagram.

**Figure 4:** Logical Design of the System.

## DESIGN AND IMPLEMENTATION

### System Design

The structure of this system will be represented through its logical design and functional decomposition. The logical design specifies the methods of interaction of system components like the input and outputs, menu structures, procedures, controls, functions and command structures. For this System, the three essential modules are: the enumerator, the system admin and the registration modules as shown in Figure 4.

### Entity Relationship Diagram

An entity relationship diagram (ERD) is a picture which shows the information that is created, stored, and used by a business system. ERD uses graphic representations to model database components. Entity is mapped to a relational table. It depicts relationship between data objects. The attribute of each data objects noted in the entity- relationship diagram can be described using a data object description.

(i) **The Entity:** is the basic building block for a data model. It is a person, place, event, or thing about which data is collected, for example, an employee, an order, or a product. An entity is depicted by a rectangle, and it is described by a singular noun spelled in capital letters.

(ii) **An Attributes:** is a type of information that is captured about an entity. For example, last name, home address, and e-mail address are all attributes of a customer. Attributes are nouns that are listed within an entity.

(iii) **The Relationship:** are associations between entities, and they are shown by lines that connect the entities together. Every relationship has a *parent entity* and a *child entity,* the parent being the first entity in the relationship, and the child being the second. The entity relationship diagram is depicted in Figure 5.

### Input Specification

The system is designed to accept several input details efficiently through input forms and user clicks. The data captured through the user keystrokes and clicks are received by specific modules on the system and relayed to the back-end of the system for processing.

### Output Specification

The system is designed in such a way that it efficiently provides output to the user promptly and in a well-organized manner. The format for the several output are make available on the output web pages.

### Database Specification

Database specification comprises all the data fields and records collected and analyzed, to help in creating a good database for the new system. The designed database involves:
  a. Assigning a unique name to the database file and
  b. Defining the structure of the file.

The database attributes include file name, field type, length or width. The database for this project was created using MySQL. MySQL is a relational database management system (RDBMS) that is highly compatible with various programming languages. It was chosen because of its compatibility and the ease with which records in the database can be accessed and manipulated from an application developed.
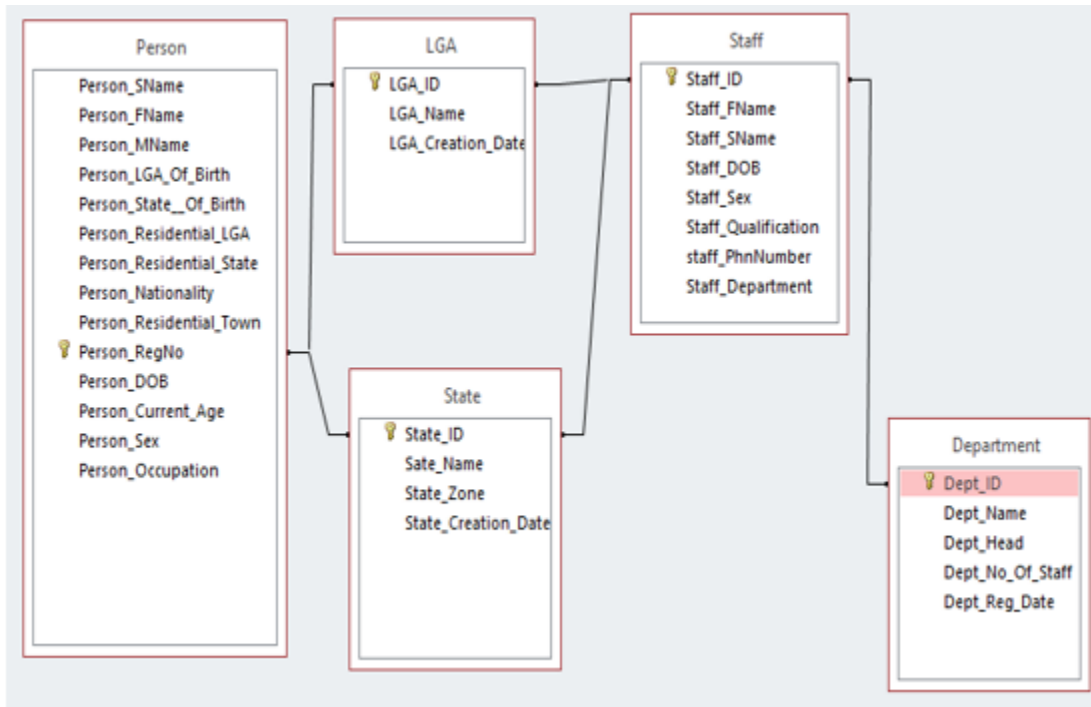
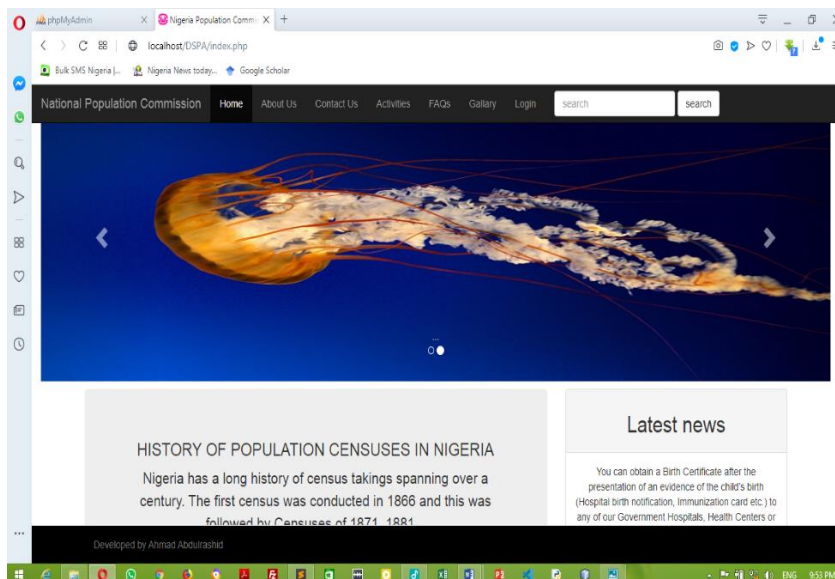**Figure 5:** Entity Relationship Diagram of the System.



**Figure 6:** Home Page of the System.

Access to the system was made possible by a graphical interface (phpmyadmin) with an ISAM engine.

**System Implementation**

The Distributed System helps to ensure the comportment of a good and reliable data collections on human population. Figure 6 displays the home page that display the background of the design system.

**Table 1:** Department Table Structure.

| S/N | Field Name | Field Type | Field Width | Description |
|---|---|---|---|---|
| 1. | Department I.D | Varchar | 25 | Department I.D Number |
| 2. | Department Name | Varchar | 60 | Name of the Department |
| 3. | Department Head | Varchar | 60 | Department Head Home |

**Table 2:** Personal Table.

| S/N | Field Name | Field Type | Field Width | Description |
|---|---|---|---|---|
| 1. | Surname | Varchar | 60 | The Person's Surname |
| 2. | First name | Varchar | 60 | The Person's First name |
| 3. | Other name | Varchar | 60 | The Person's Other name |
| 4. | Current age | Int | 5 | Current age of the person |
| 5. | Sex | Varchar | 10 | The sex of the person |
| 6. | Nationality | Varchar | 25 | The person's Nationality |
| 7. | Residential State | Varchar | 60 | The person's Residential State |
| 8. | Residential LGA | Varchar | 60 | The person's Residential LGA |
| 9. | Residential Town | Varchar | 60 | The person's Residential Town |
| 10. | Occupation | Varchar | 60 | The person's Occupation |
| 11. | State of Birth | Varchar | 60 | The person's State of origin |
| 12. | LGA of Birth | Varchar | 60 | The person's LGA of origin |
| 13. | Disabled | Varchar | 60 | Whether disabled or not |
| 14. | Work Status | Varchar | 60 | The work status of the person |

**Table 3.** Local Government Area (L.G.A) Table Structure.

| S/N | Field Name | Field Type | Field Width | Description |
|---|---|---|---|---|
| 1. | LGA I.D | Varchar | 25 | LGA I.D Number |
| 2. | LGA Name | Varchar | 60 | The Name of the LGA |
| 3. | LGA Zone | Varchar | 60 | The LGA Zone |
| 4. | LGA State | Varchar | 60 | The LGA State |

**Table 4:** State Table Structure.

| S/N | Field Name | Field Type | Field Width | Description |
|---|---|---|---|---|
| 1. | State I.D | Varchar | 25 | The State I.D Number |
| 2. | State Name | Varchar | 60 | The Name of the State |
| 3. | State Zone | Varchar | 60 | The State Zone |

**Table 5:** Staff Table Structure.

| S/N | Field Name | Field Type | Field Width | Description |
|---|---|---|---|---|
| 1. | Staff I.D | Varchar | 25 | Staff I.D Number |
| 2. | Staff name | Varchar | 60 | Name of the staff |
| 3. | Address | Varchar | 60 | Address of the staff |
| 4. | Sex | Varchar | 10 | The sex of the staff |
| 5. | Phone No | Varchar | 25 | Staff phone number |
| 6. | Email address | Varchar | 60 | Staff email address |
| 7. | Department name | Varchar | 60 | Staff department |
| 8. | Highest qualification | Varchar | 60 | Staff highest qualification |
| 9. | School attended | Varchar | 60 | School attended by staff |
| 10. | Result obtained | Varchar | 60 | Result obtained by staff |
| 11. | Other qualification | Varchar | 60 | Other qualification by staff |
| 12. | Professional qualification | Varchar | 60 | Staff professional qualification |

**Administrator Module:** The administrator is the superior of this management system. He is responsible for all the activities that are done in the system. He has to login before gaining access to the system. Figure 7 displays the admin login page.
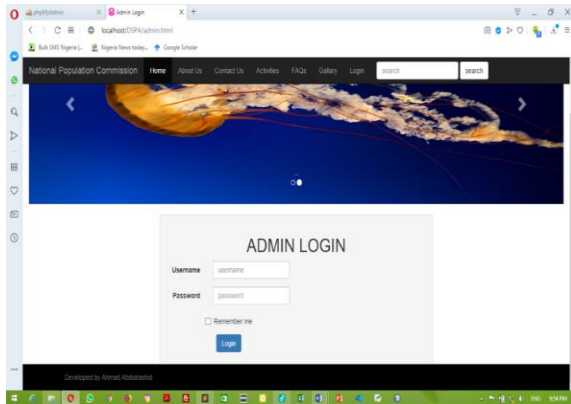


**Figure 7:** Admin Login Page.

**Administrator Home Page:** Gives admin full functionality to manage the system and also create and authorizes the enumerator account.
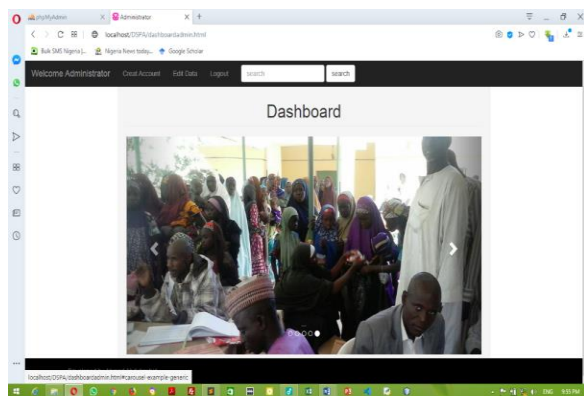


**Figure 8:** Administrator's Dashboard.

**The Administrator Activities:** Admin has access to all information in the system, and he can view report, edit or delete census data from the database
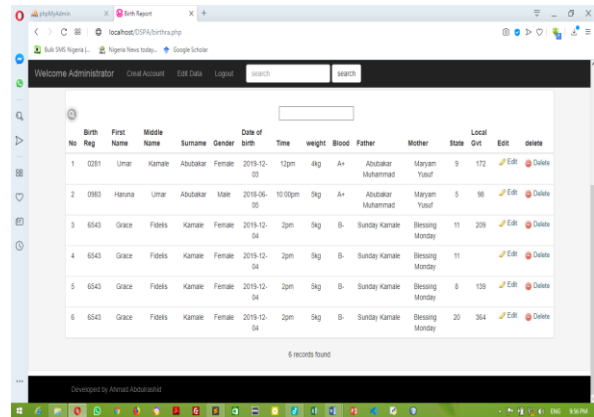


**Figure 9:** Birth Report.

**Enumerator Module:** The Enumerator is the one who has privilege to fill the census forms, which comprises of birth registration, children registration, death registration, and foreigner registration.
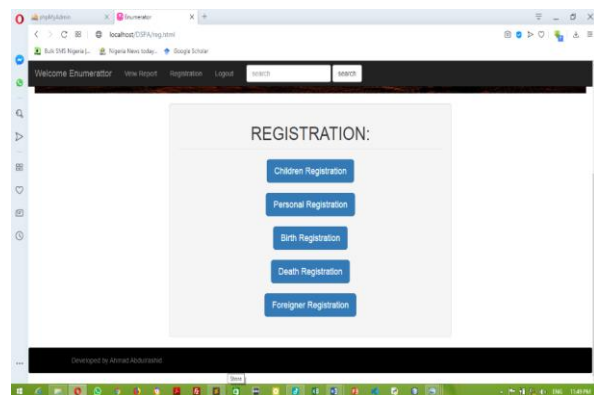


**Figure 10:** Enumerator Registration Dashboard.

After clicking on the register icon, the system navigates to a form where the enumerator is required to fill in certain information about the respondent as pre-requisite to registration. The individuals are grouped into categories which the enumerator is required to select one between. Children registration this meant an individual below 18 years, adult registration this meant an individual above 18 years, or any category of vital registrations such as birth, death or foreigner's registration category.

### Hardware and Software Interface

This section lists the minimum hardware and software requirements needed to run the system efficiently.

***Hardware Interface:***
  i. Processor of 1GHz.
  ii. 100 GB of free hard-drive space.
  iii. 1GB of RAM.
  iv. Network Interface Card

***Software Interface:***
  i. Operating system of any kind (Windows, Mac OS, Linux).
  ii. Web server of any kind (WAMP, XAMPP or MAMP).
  ***iii.*** Web Browser: Internet Explorer, Mozilla Firefox or Google Chrome.

### System Evolution

The heart of this entire Distributed System is the Database. Currently the system is only available in small scale. For large-scale, performance considerations should be considered in terms of Hardware/Software capacity/Page load time etc. Also, security vulnerabilities should be evaluated for large scale systems. In future this can also be available as a Mobile application and can be integrated within store.

We are also certain that if this system goes into actual use, many requests will arise for additional features which is not previously considered but would be useful to have. For this reason, I feel as though the application can be constantly evolving, which I consider a very good thing.

### SUMMARY

This research work has been able to identify that the use of Distributed System for Population Analysis to carry out census operations would go a long way in maintaining accurate and reliable information as well as global assessment of information.

In the same way, analysis of the existing system was done to identify the associated problems, also solutions to the identified problems were provided, and the need to have a web-based (online) system that would take care of the identified problems was discussed.

However, while analyzing the proposed system, the authors also figured out some possible defects of the system which may include, inability to handle data from other departments of the organization very effectively.

### CONCLUSION

Distributed System for Population Analysis is an application that provides inputs and outputs information support to users in order to update their demographic information, provides direct access to a specific information. Being a web-based (online) system, it means it is available to anyone, user friendly, and widely accessible across the world. And if this system can be adopted, I believe that the National Planning Commission of Nigeria will find it easier in successful planning of economic policies as well as National Population Commission of Nigeria.

### RECOMMENDATION

The proficiency, helpfulness of using web-based system to handle census has already been identified by the researchers, therefore the researchers recommend:

- That the web-based system should be adopted in the National Population Commission and the parallel changeover methodology should be adopted as that would give room for the comparison of results.

- That the enumerator should be permanently assign in every primary healthcare center, to be collecting the correct number of child at birth and the infant mortality rates in the given community.

- Government should recommend the presentation of certificate of birth by mothers during child immunization

- That the staff of the commission should be thoroughly trained on the use of the software as it would enable them to be competent.

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