

Toward the Development of Geographic Names Information Systems for the Management of Telecommunication in Nigeria

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Abstract

- Global competition is forcing telecommunication companies to stretch their boundaries as never before.
- In Nigeria, there are over 37,092 place names covering the whole Country from populated places such as cities, towns and villages up to non-polluted places such as settlements.
- Using Geographic Names technology for the management of the telecommunication industry enables telecommunication professionals to integrate location based data into analysis and management processes.

Why Geographic Names Information Systems in Telecommunication Industry

- Rapid changing telecommunications industry
- Competition and an ever-increasing scope of services offered to customers
- Locating potential customers and deciding which service to provide them

Goals and Objectives of Geographic Names Information Systems in Telecommunication Industry

- Achieve National Focus for Telecommunication Information Initiatives
- Create Strategic Organisational Framework
- Promote Geographic Names Information Systems for Nigeria
- Better Decision Making in Telecommunication Industry

Study and Design Methodology

- Desk Studies and Literature Review (include review of existing data and previous study completed)
- Review of Best Practice in Development
- Field Survey
- GIS Management

Desk Study and Literature Review

- We conducted a comprehensive research for relevant information regarding the delineation of town and cities in the country into urban, semi-urban and rural areas from the Federal Government of Nigeria to the State Government
- Reference to relevant documents as published by Federal Survey Department, National Population Commission and any other relevant organizations.

Review of Best Practice in Development.

- 1. Allow an opinion of international and national best practice in the delineation and development of gazetteer of place name.
- 2. Provide information regarding delineation of Towns, and cities in the country into Urban, semi-urban and Rural Areas.

Field Survey

- 1. Position determination by GPS were carried out using Handheld GPS.
- 2. The handheld GPS was configured before use so as to ensure that data are capture correctly by the Field Enumerators.
- 3. The GPS setting for the data collection was as follows:
 - Geodetic datum – (Minna Datum)
 - Geo-referencing Coordinates – (Decimal degrees to five decimal place)
 - Units – (Metric Unit)
 - Position Accuracy - 1-5 meters (3-17ft) with DGPS correction, 15 meters (49ft) with handheld GPS.....

Storing of the data collected on a database

- 1. **Entries included information :**
 - Federally recognized name for the feature;
 - Geographic names
 - The county or counties in which each named feature was located
 - The geographic coordinates (in degrees, minutes, and seconds, as well as decimal degrees) that locate the approximate center of an area
- 2. **The Place Name Database therefore, contain the following information about a selected geographic feature:**
 - Federally recognized feature name
 - Feature type
 - Elevation (where available)
 - Estimated 1991 population and population projection for 2003 of incorporated cities and towns
 - State(s) and town(s) in which the feature is located
 - Latitude and longitude of the feature location

GIS Management

- 1. GIS technology enables telecommunication professionals to integrate location-based data into analysis and management processes in network planning and operations...
- 2. The thirty six States and FCT analogue maps covering the entire 774 Local Government Areas of Nigeria were acquired and converted into digital formats and stored in industry standard topological formats e.g., Arcview shape files as **shp, apr, dbf, sbn and sbx** files.
- 3. The thirty six States and FCT digital maps in ArcView files have a comprehensive metadata comprising of the following:
 - Map of the Each State showing the State Boundary
 - Map of the Each State showing the Local Government Boundary
 - Map of the Six Geopolitical Zones
 - Map of the State showing the Urban, Semi-Urban and Rural Areas.

Importance of the Geographic Names Information Systems (GNIS) in Telecommunication Industry

- 1. **GNIS as NCC Official Repository**
 - For the purpose of licensing
 - For telecommunication operators to which names enquiries, names issues and new names proposal can be directed.
 - The GNIS is supporting the telecommunication industry as the source for the gazetteer search in the National Communication Commission GNIS Map viewer for Federal Boundaries and geographic features not available from state or local government areas.

Importance of the Geographic Names Information Systems (GNIS) in Telecommunication Industry (contd.)

- 1. Assist in establishing uniform geographic name usage throughout the Federation.
- 2. Provide an index of names found on Federal, State, and other maps.
- 3. Eliminate duplication in time and money spent by Government agencies, industry, and institutions to organize similar data files for specific needs.
- 4. Provide an interface for integrating data from other systems for multidisciplinary use.
- 5. Provide standardization of data elements and their coded representation for the telecommunication industry.
- 6. Provide support for the Nation's infrastructure.
- 7. Meet National Communication Commission information requirements prescribed by law.

Develop criteria for the delineation of Cities and Towns into Urban, Semi-Urban and Rural Areas

Population

- ❖ The population figures for the each states, local government area and settlements
- ❖ The 1991 population census for the states, local government area and settlements were obtained from the National Population Commission and projected to 2004.
- ❖ The delineation criteria used were based on projected data of 2004 as follows:
 - ❖ Urban (U) = State Capital + Population > 50,000
 - ❖ Semi-Urban (SU) = Population > 25,000
 - ❖ Rural (R) = Local Government Headquarters + Population < 25,000
- ❖ A further classification to reflect settlements that are not covered by the above definition will be specified as: Settlements (S) = Population < 10,000.

Categorize the Cities and Towns into Urban, Semi-Urban and Rural Areas

Urban and Rural Classification

- ❖ The National Population Commission classifies as "urban" consist of all territory, population, and housing units located within an urbanized area (UA) or an urban cluster (UC).
- ❖ It delineates UA and UC boundaries to encompass densely human settlements.
- ❖ The National Population Commission classification of "rural" consists of all territory, population, and housing units located outside of UA's and UC's.
- ❖ The rural component contains both place and non-place territory. Geographic

Categorize the Cities and Towns into Urban, Semi-Urban and Rural Areas

- ❖ Geographic entities, such as census tracts, counties, metropolitan areas, and the territory outside metropolitan areas, often are "split" between urban and rural territory.
- ❖ The population and housing units they contain often are partly classified as urban and partly classified as rural.
- ❖ The criteria and the hierarchy for categorizing the cities and towns into urban, semi-urban and rural areas will include and not limited to the following.
 - ❖ Communities or major settlements.
 - ❖ Sub centers, which may be larger communities, trade or traffic centers or other faster developing local points.
 - ❖ Local Government Area Centers (Headquarter).
 - ❖ Centers such As State Capitals.
 - ❖ Major Cities or Sub centers that are developing in the vicinity of other centers.

Categorize the Cities and Towns into Urban, Semi-Urban and Rural Areas

- ❖ Further analysis out of the criteria will be carried out to establish conditions of the state/geo-political zones relating to:
 - ❖ Structure and spatial Organisation of the state/Geo-political zone
 - ❖ Role and function of towns / settlements
 - ❖ Business, Industrial and Market development
 - ❖ Catchment areas
 - ❖ Natural settings/ecological zones
 - ❖ Settlement patterns
 - ❖ Social facility such as Education, Health and water
 - ❖ Rural-urban relationships
 - ❖ Urban poverty Areas
 - ❖ Land use pattern
 - ❖ Major facilities
 - ❖ Potentials and constraints

Production of the List of Cities, Towns, Villages and Settlements in Nigeria.

- ❖ A definitive gazetteer for place names covering the over 37,092 places in Nigeria has been compiled.
- ❖ This contains information about physical and cultural geographic features both physical and cultural geographic features both current and historical.
- ❖ The gazetteer is tagged **Geographic Names Information System (GNIS)**.
- ❖ The Names of the over 37,092 towns and cities alongside their National Grid reference making this the most comprehensive place name index covering the whole of Nigeria is listed alphabetically as they appear on all the maps.



Problems Encountered

- ❖ **Lack of Up-To-Date Maps**
 - ❖ Federal and State Governments maps are out-date
- ❖ **Information not Readily Available**
 - ❖ Information framework, which will give the community access to the Fundamental Datasets, is still posing significant problems.
- ❖ **Duplication of Data by Various Agencies**
 - ❖ There is lack of cohesive framework for effective coordination of geo-spatial activities, which is resulting in unnecessary duplication of efforts and outputs.
- ❖ **Discrepancies in Population Data**
 - ❖ Population data by various agencies and ministries differ.
- ❖ **Technical Standards**
 - ❖ In the context of Geographic Names Information Systems, Technical Standards need to be defined. This is because national Geographic Names Information Systems requires standards in each of the following areas: reference systems, data models, data dictionaries, data quality, data transfer, and metadata.
- ❖ **Lack of Importance of GIS by Decision Makers**
 - ❖ This is a serious limitation, largely as a consequence of the apparent lack of awareness on the part of decision-makers about the value and benefits of GNIS.

Results

- ❖ A definitive gazetteer of place names covering the over 37,029 in Nigeria has been compiled.
- ❖ The major source of the place and feature names is the Nigeria Standard Map series.
- ❖ The gazetteer of place names is presented alphabetically based on the Thirty-Six states and Federal Capital Territory administrative structure.
- ❖ The gazetteer of place names is stored in a database which hold the federally recognized names of each feature and defines the location of the Town, City or Place by State, Local Government area and Geographic Coordinates

Significance of the Work

- ❖ The delineation of Town and Cities in the Country into Urban, Semi-Urban and Rural Areas is the compendium of Gazetteer of the Nigeria Place Names, which is a unique source of geographic information.
- ❖ It provides the most exhaustive place name index and relate each place name to a set of administrative areas alongside their National Grid reference, making this the most comprehensive place name index of Nigeria.

Recommendations

- ❖ Considering these limitations, it is therefore, essential that National Communication Commission should be in place a guide to update the GNIS regularly and this should include:
 - ❖ Providing a co-ordination mechanism for the update and maintenance programs of the geographic names database.
 - ❖ Defining and supporting a national directory (system) for the fundamental geographic datasets
 - ❖ Facilitating the development and implementation of technical standards on geographic names datasets

- ❖ Sponsoring multi-agency GIS demonstration and pilot projects
- ❖ Identifying education and training needs and facilitating the implementation of training programs
- ❖ Assisting each sphere of government to define and co-ordinate their respective areas of responsibility for fundamental names datasets, and to co-ordinate cross-jurisdiction policies, standards and programs

Conclusions

- ❖ **Geographic Names Information System (GNIS) is the key to planning and sustainable management and development of utilities services at Federal, State and Local levels.**
- ❖ **It is also fundamental to the development of the economic and social infrastructure, provision of community services,**
- ❖ **Effective government administration and resolution of community conflicts.**

❶ The GNIS is necessary to support Nigeria's economic, political and social development and well-being.

❷ Not only is it essential for the development of an innovative and competitive spatial data industry, it is an indispensable resource for decision-making across all sectors of business, industry and the community.

THANK YOU 4 LISTENING

