

DEVELOPING A MULTIMEDIA GIS DATABASE FOR TOURISM INDUSTRY IN NIGERIA

O. O. Ayeni, D. N. Saka (Mrs.), G. Ikwuemesi
Department of Surveying and Geoinformatics,
Faculty of Engineering
University of Lagos, Yaba, Lagos, Nigeria.
ooayeni@yahoo.com

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ABSTRACT:

Nigeria's determined efforts to promote Tourism Industry since 1991 were enumerated. This includes the establishment of the National Policy on Tourism and the National Tourism Development Corporation (NTDC) with the objective of making Nigeria the ultimate tourism destination in Africa. Tourism spatial and attribute data gathered were classified into three categories – Cultural, Ecological and Modern day tourism. A relational GIS database was created using Arc View and graphic (map), picture and sound data were integrated into the multimedia GIS database. The various software which made this possible were; Microsoft Excel, Arcview, ArcGIS, AutoCAD release 14, CAD Overlay, Media Studio Pro 5, Video Edition and ULEAD Video Studio with a firewire adapter. The various outputs from the database include aspatial queries, analogue and electronic Tourism Atlas, Encyclopedia, a Digital library of Tourism.

1. INTRODUCTION

1.1 Development of Tourism

The Nigerian Government in her quest to diversify her mono-cultural economy, which is heavily dependent on petroleum export, has decided to take some measures to promote travel and tourism. The measures include the establishment of the National Tourism Policy (NTP) in 1990, the birth of the Nigerian Tourism Development Corporation (NTDC) in 1992, the founding of the National Institute for Hospitality and Tourism (NIHOTOUR), in Baganda, Kano, and the National travel Bureau (NTB), a tour operating company of NTDC, (NTDC (2001)) the adoption of a Tourism master plan and National Tourism Council with the President as chairman. The aims of these measures can be summarized as follows:

- i. To make Nigeria the ultimate Tourism destination in Africa and;
- ii. To make Tourism one of the greatest foreign exchange earners in an oil dependent economy.

2. OBJECTIVE

With a population of about 120million people made of about 300 ethnic groups, a vast land of about 1million sqkm, a beautiful coastland of about 835km, a rich diversity of cultural and ecological resources, Nigeria appears destined to be indeed the "Giant" of Africa as far as tourism is concerned. The objective of this research is to develop a multimedia GIS database for Tourism industry as a perceived technical solution to the problem of promoting both domestic and international tourism in Nigeria. Such a database constitutes the basis for promoting efficient and productive multimedia spatial information services by private and government tourism agents all over the country. The greatest challenges in developing a multimedia GIS is to integrate different types of data such as text data, graphical data (maps, graphs), pictures data (still and moving Pictures) and sound data (voice and music), thus

creating in some cases, a multiple representation for the same data.

3. METHODOLOGY

3.1 Classification of Tourism Data

In this research, tourism data were gathered in under the following categories, which constitute layers and sub layers in the designed GIS database:

- **Traditional Cultural Tourism:** Museum, art galleries, cultural, religious and national festivals, historical monuments, natural features such as sites and buildings, arts and crafts.
- **Ecological Tourism:** Geological / geophysical / geomorphological features, (mountains, waters, falls, springs, beaches, national parks, games/forest reserves, botanical / zoological gardens etc.
- **Notable modern Features and Facilities:** Hydroelectric power, dams, oil rigs, sporting facilities and other notable engineering structures. Travel and Accommodation Facilities, Tourism Centers and agents, and other related data to tourism (see fig 1).

The data obtained under the three classes were related to their geographical locations in their states and local government areas of Nigeria. Table 1a, b, c contains a sample data from the Database showing tourism attraction from some states, their local governments, the type and class of Tourism attraction, (Ayeni et. al (2001)).

3.2 Source of Data, Hardware and Software

Sources of data include existing maps, plan and charts, textbooks, Internet websites, newspapers, magazines, brochures, travel guides and questionnaire. Survey and GPS Survey was used to update existing maps and digital camera and digital video camera to capture some data at tourism sites. Some analogue graphics and maps were converted into digital format using A0 Digitizer with AutoCAD Release 14 software.

Other maps were scanned with A0 scanner and on-screen digitizing was done using AutoCAD Overlay. A0 and A3 printers on line with Pentium IV were used for graphics and data processing.

Other software were used in this project: Arc View 3.1, ArcGIS 8.1 for creation of a relational GIS database, Microsoft Excel for relational tabular data, and Microsoft Word for processing, editing and display of textual data. The tabular and textual data were finally exported to Arc View GIS environment.

Ulead Media Studio Pro 5 and Microsoft Windows Media Player were used in this project to convert recorded sound to wave files and scanned images, text and pictures into video clips. Video clips directly recorded using the Digital Video Camera were downloaded using ULEAD VIDEOSTUDIO Version 5.0 and Windows Movie Makers with a FIREWIRE 1394 adapter, into the Pentium IV 2.4GHz Computer equipped with a microphone where the relational GIS database was created. Video clips with sound were hot-linked with the other types of data in the Arc View GIS environment using Arc View Script files, thereby creating a multimedia GIS database for tourism in Nigeria. The capabilities of other multimedia software such as Macromedia Flash 4, Animator Designer 3, Dream Weaver 3, and Fireworks 3 are being fully investigated to assess their efficiency for Multimedia GIS Application. (Ayeni et. al (2003))

3.3 Multimedia GIS Database

There are two basic approaches to creating a multimedia GIS Database viz “multimedia in GIS” approach in contrast to “GIS in Multimedia” Schneider (1999). It is difficult to integrate GIS functions into multimedia. Therefore, the first approach was adopted for this research, because of its simplicity and user-friendly nature.

The procedure for developing a GIS Database may be summarized as follows:

- Conversion of analogue map to digital format using two methods described in section 3.2 and creation of shape files.
- Creation of relational tabular database with their attributes and hotlinking with shape files in Arc View GIS environment.
- Creation of GIS database for Tourism with capabilities for queries.
- Conversion of recorded digital photographs and video clips and sound to wave files and to AVI format.
- Linking multimedia files to files in GIS database.

All the constituents of the multimedia GIS database are depicted in fig. 2.

4. DISCUSSION OF RESULTS

Fig. 3 illustrates the various outputs, which were generated from the multimedia GIS database for Tourism Industry in Nigeria. The outputs from the multimedia GIS database include the following –

- **Maps, graphics, pictures and video clips about tourism interests**, which were printed on an online A3 Cannon Printer or A0 HP 800 Design Jet printer.
- **Multimedia Atlas of Tourism in Nigeria in analogue and digital format.**
- **Digital Library of Tourism in Nigeria** showing the status of major tourist interests and publications on tourism.

- **Encyclopedia of Tourism in Nigeria in Digital and Analogue format.**
- **A user-friendly Multimedia GIS database**, which can lead a tourist to his destination of interest in Nigeria. The database can be subjected by the user to dynamic multimedia spatial and aspatial queries using SQL. The database is a potent tool for tourism promotion.

Fig. 4 shows the map of Nigeria with 36 states and Abuja Federal Capital Territory (FCT). A click on any of the states or Abuja opens up a wealth of tourism information and their locations as shown in Table II from Abuja. The information may also be tabular text, imagery, moving picture, sound etc. about the state. Fig. 5 shows the map of Abuja. A click on a menu will show some multimedia files on tourism.

5. CONCLUSION AND RECOMMENDATION

The Multimedia GIS database for tourism is a veritable tool for attracting indigenous and foreign investors to contribute to the economic development of Nigeria, apart from making access to tourism information easy to both Nigerians international travelers. It is therefore recommended that a multimedia GIS database for tourism should be made available on the websites of the Nigerian government and those of tourists and travel agents.

ACKNOWLEDGEMENTS

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TABLE 1a: EXTRACT FROM DATABASE OF CULTURAL TOURIST ATTRACTIONS IN ABIA STATE, NIGERIA

STATE ID	STATE NAME	DESCRIPTION OF TOURIST ATTRACTION	L.G.A	TYPE	CLASS
1	Abia	Long Juju of Arochukwu	Arochukwu	Historic	Monument
1	Abia	National War Museum	Umuachid	Historic	Museum
1	Abia	Ujari Museum	Arochukwu	Historic	Museum
1	Abia	National Museum of Colonial History	Aba	Historic	Museum
1	Abia	Ojukwu Bunker	Umuahia	Historic	Relic

TABLE 1b: EXTRACT FROM DATABASE OF ECOLOGICAL TOURIST ATTRACTIONS IN ABIA STATE, NIGERIA

STATE ID	STATE NAME	DESCRIPTION OF TOURIST ATTRACTION	L.G.A	TYPE	CLASS
1	Abia	Nkpuru kem Rock and Cave at Afikpo	Afikpo	Ecological	Cave
1	Abia	Ehoma and Iyieke lakes	Afikpo	Ecological	River/Creek/Lake
1	Abia	Azumiri Blue River	Ukwa	Ecological	River/Creek/Lake
1	Abia	Amasu Creeks	Arochukwu	Ecological	River/Creek/Lake
1	Abia	Ndi Okpo ihechiowa Cave	Ohafia	Ecological	Cave

TABLE 1c: EXTRACT FROM DATABASE OF MODERN TOURIST ATTRACTIONS IN ADAMAWA STATE, NIGERIA

STATE ID	STATE NAME	DESCRIPTION OF TOURIST ATTRACTION	L.G.A	TYPE	CLASS
2	Adamawa	Kiri Dam	Kiri (Guyuk)	Modern	H.E.P.
2	Adamawa	Savannah Sugar Company	Gywana (Numan)	Modern	Industry
2	Adamawa	Elephant Houses	Guyuk	Modern	Industry
2	Adamawa	Jimeta Garden Park	Jimeta-Yola	Modern	Resort

TABLE 2: SAMPLE INFORMATION ABOUT KATSINA STATE, NIGERIA

Capital: Katsina

Area: 24052.37 sq kilometres

Population: 4,437,241 (1997 FOS est.)

Language: Hausa

Location

The State is bounded in the East by Kano State, in the West by Sokoto State, in the South by Kaduna State and in the North by the Niger Republic.

History

Katsina State was created in September 1989 and carved out of the former Kaduna State.

It is made up of two emirates which feature prominently in the establishment of the seven Hausa Kingdoms. The lineage between Bayajida and Daurama produced the founders of Daura, Katsina, Zaria, Kano, Rano Gobir and Biram. The legendary Kusugu well where the snake called Sarki was slain is one of the tourist attractions of Daura.

Katsina was founded by Kumayo and before the Fulani conquest had been an important seat of learning and a commercial centre of the trans-Saharan Trade. It provided one of the earliest education centres of the north.

Local Government Areas

Bakori, Batagarawa, Batsari, Baure, Bindawa, Charanchi, Dandume, Danja, Dan Musa, Daura, Dutsi, Dutsin-Ma, Faskari, Funtua, Ingawa, Jibia, Kafur, Kaita, Kankara, Kankia, Katsina, Kurfi, Kusada, Mai'Adua, Malumfashi, Mani, Mashi, Matazoo, Musawa, Rimi, Sabuwa, Safana, Sandamu, Zango.

Notable Tourist Attractions

Notable Tourist Attractions in the State include the 300 Years Old Gobarau Minaret, Kastina, the famous Danmarina Tomb, the 10th Century Kusugu Well, Daura, and many other interesting attractions that make it a wonderful place to visit.

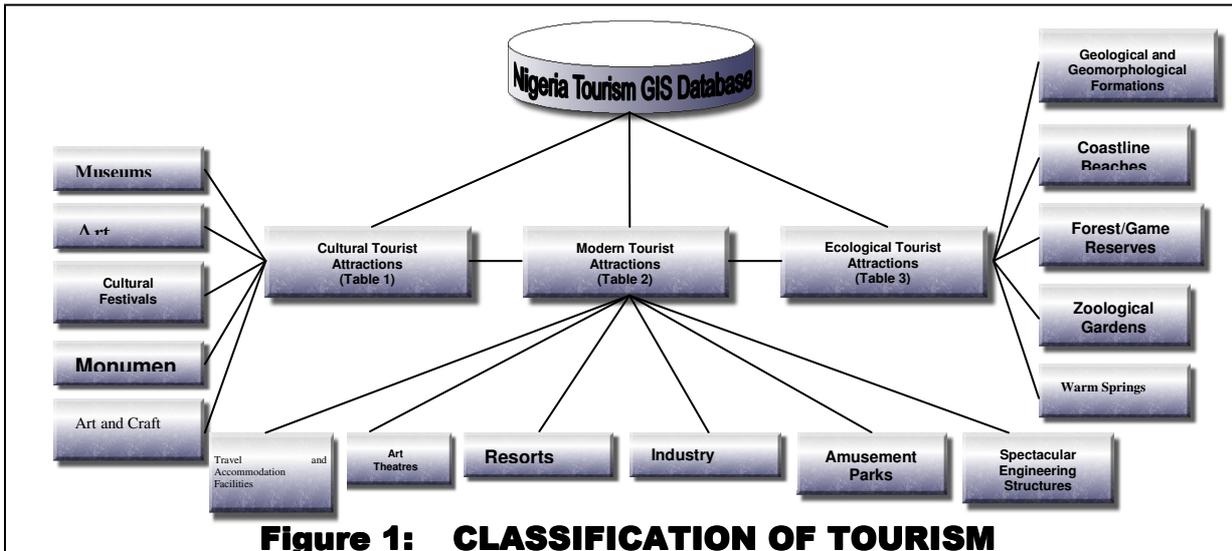


Figure 1: CLASSIFICATION OF TOURISM

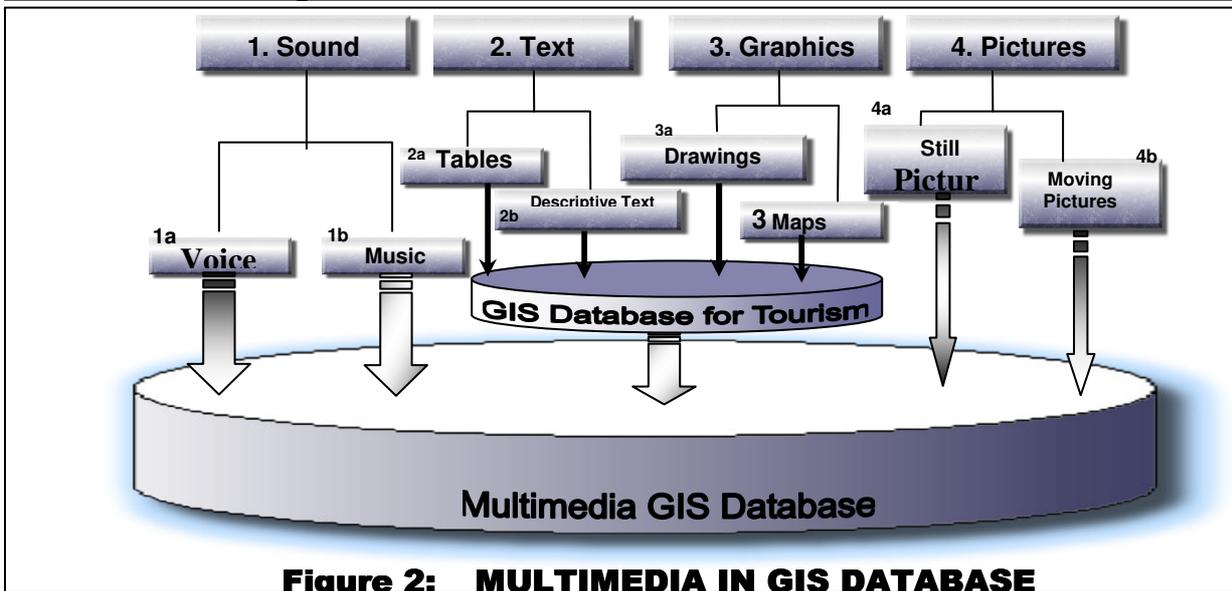


Figure 2: MULTIMEDIA IN GIS DATABASE

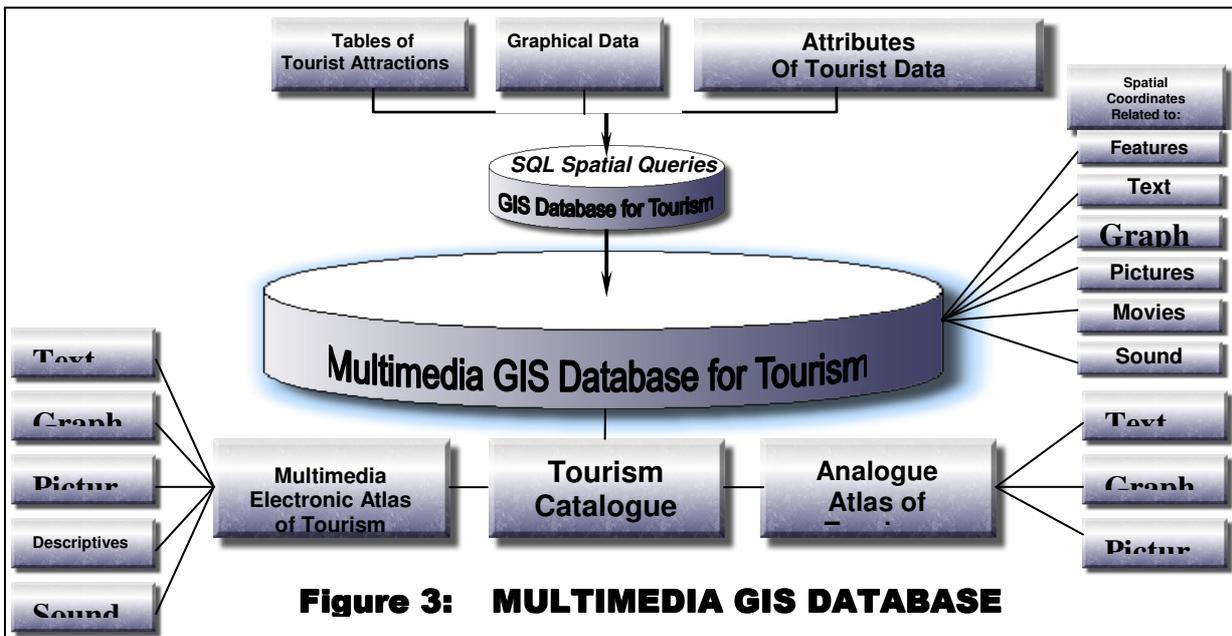
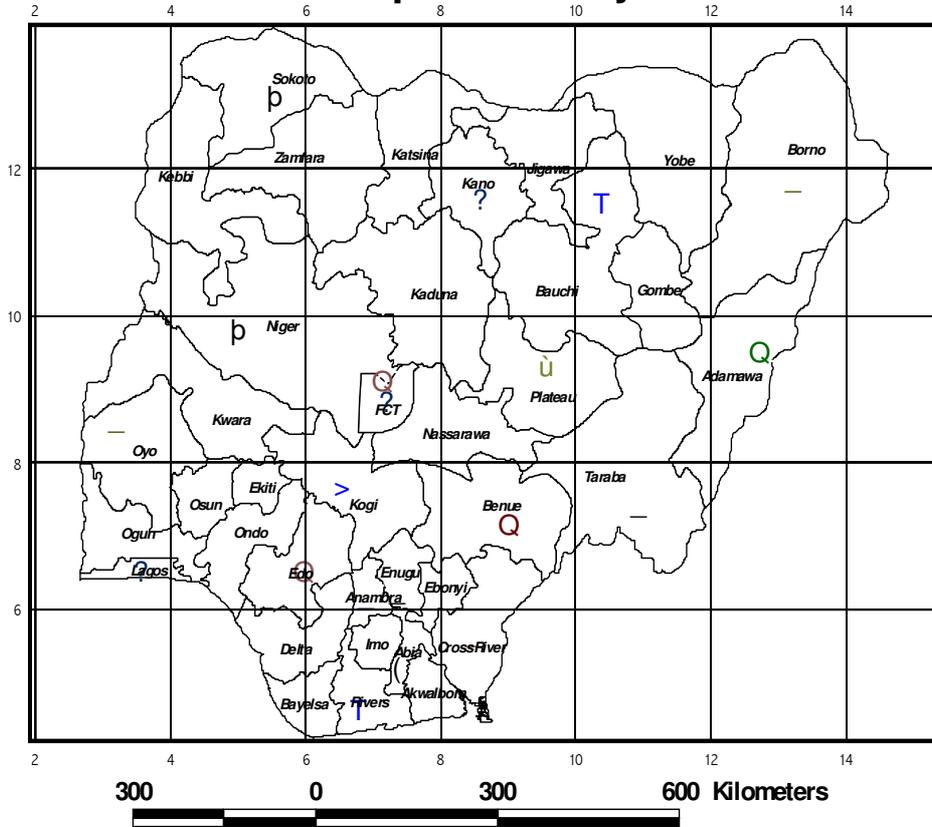


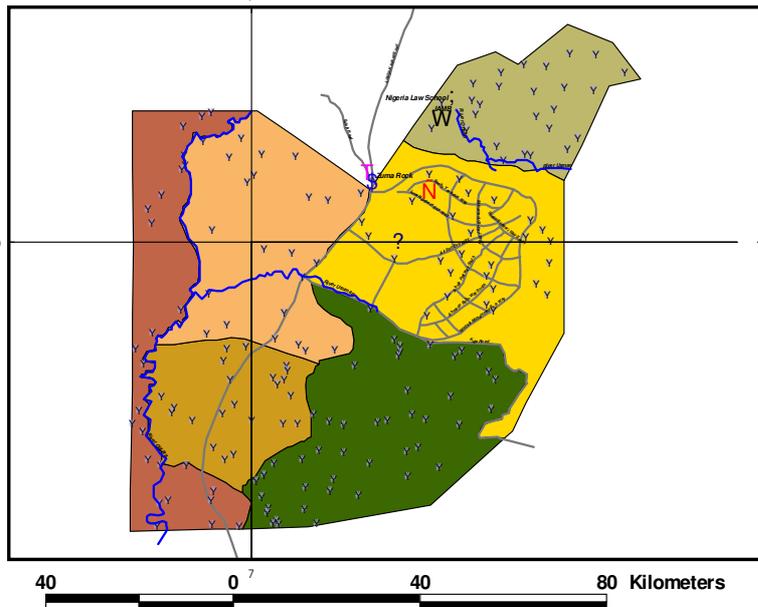
Figure 3: MULTIMEDIA GIS DATABASE

Figure 4: Map of Nigeria Showing Some Tourist Attractions in States of Nigeria and The Federal Capital Territory



- Popular Tourist Attractions**
- ? Aminu Kano Int'l Airport
 - (Arochukwu Cave
 - ⊖ Bakolori Dam
 - > Egeneja Warm Spring
 - Gashaka Gumti Game Reserve
 - Green Lake Park
 - Q Gurara Falls
 - u Jos Wild Life Park
 - ⊖ Kainji Dam
 - Q Mandara Mountains
 - ? Murtala Muhammed Int'l Airport
 - ? Nnamdi Azikiwe Int'l Airport
 - Obudu Cattle Ranch
 - Ogbunike Cave
 - T Okrika Aquatic Stadium
 - Old Oyo National Park
 - Sambisa Game Reserve
 - Samorika Hill
 - Q Ushogo Hills
 - T Wikki Warm Springs
 - Nigeria

Figure 5: Map Showing Tourist Attractions of Interest in the Federal Capital Territory (FCT)



- Tourist Attractions**
- T Gurara Fall
 - N Gwarinpa Hospital
 - W JAMB
 - Nigeria Law Sch.
 - ? Nnamdi Azikiwe Int'l Airp.
 - \$ Zuma Rock
 - ∩ Rivers
 - ∩ Towns and Villages
 - ∩ Express Roads
- Area Council**
- Abaji
 - Abuja Municipal
 - Bwari
 - Gwagwalada
 - Kuje
 - Kwali