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DEVELOPING AN INTERACTIVE WEB MAP OF ABIA STATE POLYTECHNIC, ABA-NIGERIA, AS A VEHICLE FOR RESOURCE INVENTORY AND SUSTAINABLE DEVELOPMENT
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ABSTRACT

This paper is premised on the utilization of interesting capabilities geospatial technology and the web offers. Georeferencing and digitizing was carried out in Quantum GIS software. We created web map of Abia State Polytechnic, Aba campus. This can be browsed online at https://qgiscloud.com/abainami/FrancisOtia_HND_Proj_updtd/

One very effective way to make map information available to a group of nontechnical end users is to make it available through a web page. The emergence of online consumer geoinformatics services has strengthen web search engines like Google https://www.google.com releasing its own dedicated geographic interface.

KEYWORDS

- Georeferencing

- Geospatial Technology

- Layer

- Satellite Imagery

- Web Mapping

INTRODUCTION

- A web map is an interactive display of geographic information, in the form of a web page that you can use to tell stories and answer questions.

- In the past, most digital geographic information was confined to specialized software on desktop PCs and could not be easily shared.

- With the advent of web mapping, geographical information can be shared, visualized, and edited in the browser.

- The term "Web mapping" constitutes both the technology and art of sharing maps on the Internet

- The simplest Internet-based maps are static, such as images (i.e., jpegs or tiffs) that do not allow users to change the components, extent, or appearance of the map.

- These maps are the easiest and simplest to share because all that is required is placing the image on a Web server and telling others where to find it.

- At the opposite end of the spectrum are customizable, interactive Web-based maps.

INTRODUCTION

- Web maps are useful for various purposes, such as data visualization in journalism (and elsewhere), displaying real-time spatial data, powering spatial queries in online catalogs and search tools, providing computational tools, reporting, and collaborative mapping.

- This paper focused on producing a web map. A web-based interactive map was designed and produced for Abia State Polytechnic, campus, Aba, Abia State - Nigeria.
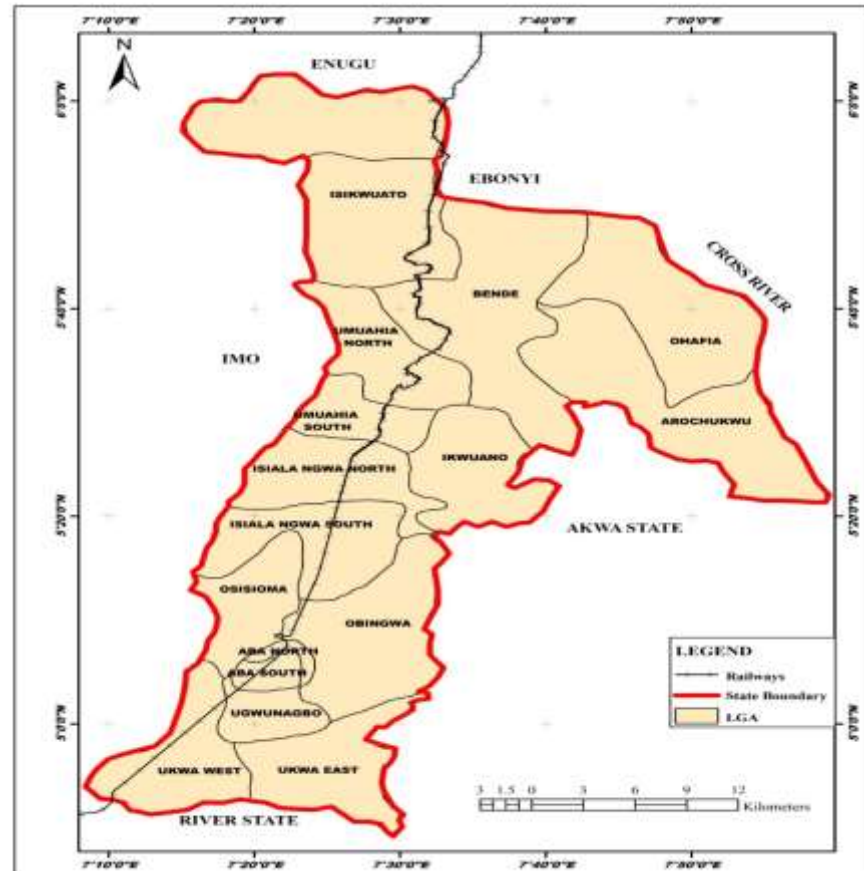
STUDY AREA

The study area is Abia State Polytechnic Campus. The polytechnic is located in Aba North L.G.A. of Abia State – Nigeria, West Africa. The study area is located within the geographical coordinates of between latitude 5°06'N and 5°07'N and between longitude 7°21'E and 7° 23'

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FIG1: MAP OF ABIA STATE

DATA AND METHODOLOGY

- The combination of data from different sources to a large extent have simplified the representation of geographic entities.
- This research work undertook several of these approaches. Remote Sensing method, direct observation of spatial object location via GPS and social survey for comprehensive attribute of geographic phenomena present within the study area were all adopted for this project.
- The data needed to carry out this project effectively are:
- Google satellite imagery of the study area.
- Positional data (co-ordinates of points) of features locations such as buildings and salient features were obtained by GPS observations.
- Social surveys were conducted in order to determine the attribute data (descriptive information) of the existing spatial elements within the study area.

The hardware for this project includes:

1. Promark3 GPS for the verification and acquisition exercise of the primary source of our data. This GPS (Promark3 GPS) was used for the acquisition of the vector data i.e Northing (N) and Easting (E) coordinates for the mapping of the locations showing the study area.

2. HP Pavilion dv3 with the following configuration/properties was used:

Processor: Intel® Core™2 Duo CPU T6500 @ 2.10GHz

Installed Memory (RAM): 4.00GB

System Type: 64-bit operating system, x64-based processor

Main Memory: 500 GB

DVD/CD Reader/writer

Flat screen VDU

HP Jet plotter.

Also the software used for the production of the interactive web map of the campus includes: Quantum GIS (QGIS) 3.6, Google Earth , Microsoft Excel and Microsoft word.

METHODOLOGY

ACQUISITION OF FIELD DATA

The field data was acquired using a Promark-3 Differential GPS. The data acquisition was done this way: the instrument, Promark-3 Differential GPS was signed out from the Surveying and Geo-Informatics Department Stores, and then taken to the field. Through the help of the recce diagram, features such as buildings, electric poles, roads were picked as point coordinates. For the buildings, the instrument was placed at the center and then allowed to get satellites signals and thus was placed there for about two minutes before the X and Y Coordinates were taken (recorded into the field book). The attribute of the buildings was also documented and used for the population of the database. Field definitions such as type of object, object name, object ID, object status, object coordinate (easting, northing) were considered at the stage of data acquisition and preliminary planning.

METHODOLOGY

GEOREFERENCING AND DIGITIZING

- In order to "tell" a raster map where it "lives" in the world, the process of georeferencing is inevitable. Georeferencin*g* is the process of assigning real-world coordinates to each pixel of the raster.
- These coordinates were obtained by observed coordinates with Promark 3 Differential GPS. Prominent features that were easily noticeable on the google earth were identified and their rectangular coordinates (easting and northing) taken.
- The Georeferencing was done in QGIS via the 'Georeferencer GDAL' plugin. The saved image in jpeg extension was attached via the georeferencer tool and all the appropriate parameters were included and standard procedures was followed to ensure that the existing real world coordinates were harmonized to the image coordinates of the study area.
- On the other hand, the x, y coordinates of point, line and polygon features were recorded electronically and stored as the spatial data. The feature attributes were also populated during the digitizing process.

RESULTS AND DISCUSSION

- Web maps are interactive. The programmer will present an interface, which enables us to make choice depending on what is desired like selecting different map data layers or features to view, inspecting feature properties, editing existing content or submitting a new content.

- Google earth satellite imagery were downloaded from the internet. Some non-spatial data were obtained through social surveys and GPS observation was done to directly capture the x, y co-ordinates of the locations for geo referencing (Using Promark-3 Differential GPS).

- Quantum GIS was used for processing the data and the coordinate system settings was set to the appropriate projection i.e EPSG: 4326 - WGS84.

- The QGIS Cloud plugin was then used in publishing the map to the web and the link to the web map copied .Below is the link:

- https://qgiscloud.com/abainami/Francis_Otia_HND_Proj_updtd/

FIG2: COMPOSITE MAP OF ABIA STATE POLYTECHNIC CAMPUS
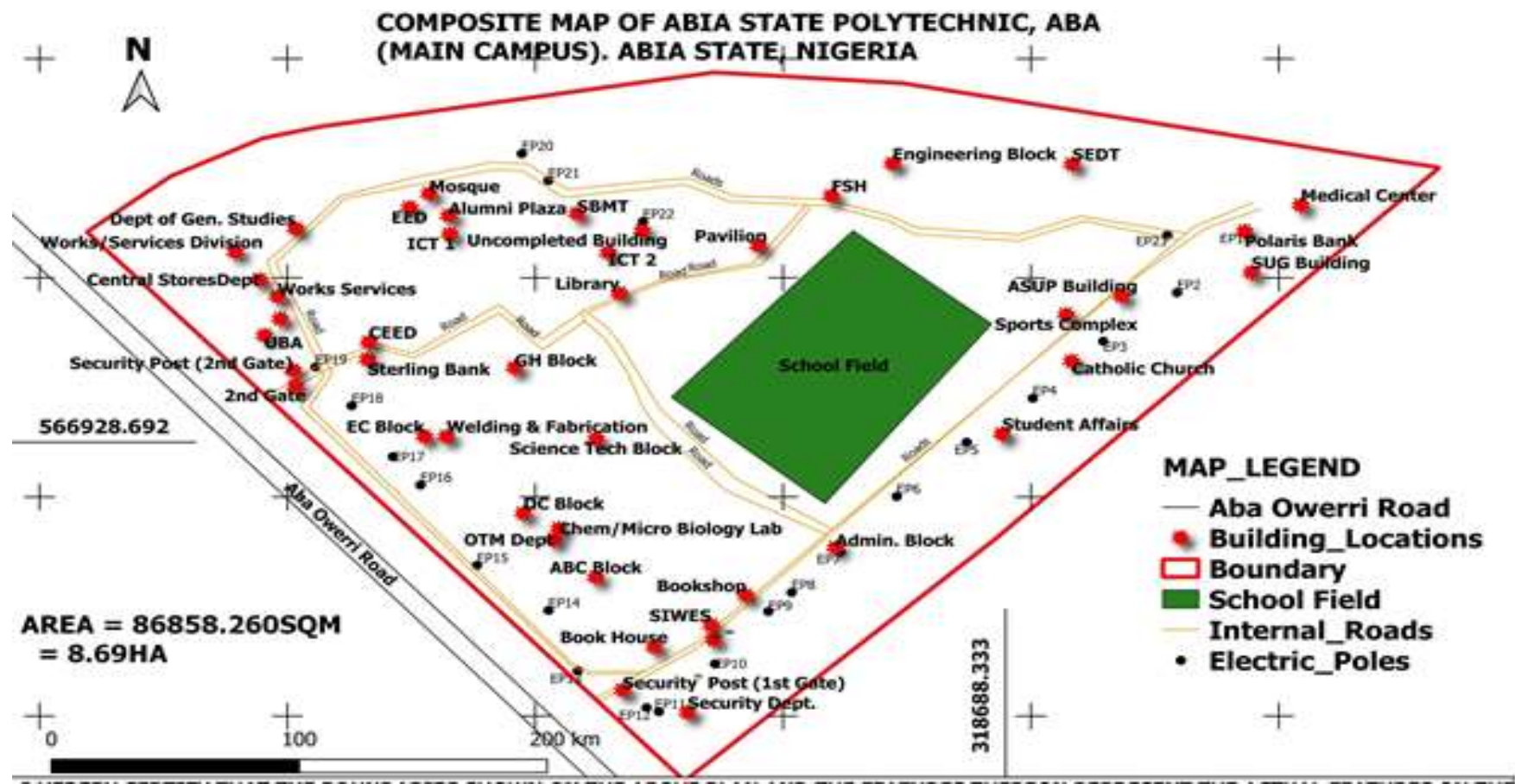
COMPOSITE MAP OF ABIA STATE POLYTECHNIC, ABA (MAIN CAMPUS). ABIA STATE, NIGERIA

CONCLUSION

- A web map is an interactive display of geographic information, in the form of a web page, that you can use to tell stories and answer questions.

- In the past, most digital geographic information was confined to specialized software on desktop PCs and could not be easily shared. With the advent of web mapping, geographical information can be shared, visualized, and edited in the browser.

- It is worthy to conclude that the synergy between geospatial and World Wide Web has helped in a greater measure by providing opportunities for the global community to interact via the internet, share data and have access to information like never before.

- The interactive web map of Abia State Polytechnic is part of this recent happening in the global community.

APPRECIATION

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