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**Module: GIS-401**

**Data Collection Report for the Blantyre Tertiary Education Institutions (BTEI) Geographic Information System (GIS)**

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**From**

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**BTEI GIS Project**

**Data Collection Report**

# Introduction

Data is an essential element of any geographic information system. The main importance of geographic information systems is to support communication and decision support tools which all rely on availability of high quality and accurate spatial data. This makes the data collection process for a GIS application an important and crucial task to the success of the system. However, this process is time consuming and expensive as it has to be carefully done to provide high quality data. Essential data has to be collected using different methods and in different formats including raster and vector.

This document seeks to present a detailed report of the data collection process for the Blantyre Tertiary Education Institutions (**BTEI**) geographic information system (**GIS**).

The BTEI GIS will be a geographic information system that will store information of tertiary education institutions and skills development institutions in Blantyre. It will be accessible over the internet and will provide information to the public.

# Project Background

In Malawi, it is the current norm for students to pursue and attain an academic qualification higher than the regular Malawi School Certificate of education (MSCE). Students and parents look for information on available colleges together with relevant information on what they are offering that is: courses and approximate fees and possibly academic calendars.

Unfortunately, such information is not readily available and acquisition of such information is expensive. Potential students together with their parents incur costs to travel around to acquire this information. This is more expensive since these students want to compare available options hence they have to make travelling’s to several institutions across the city. Furthermore, acquisition of information puts an extra overhead on time which would have been used for other productive work.

# Data Collection Workflow

This section presents a detailed workflow of the tasks that were carried out during the collection of the geo-spatial data for the BTEI GIS software. Like most GIS software systems, data collection process for the BTEI GIS followed the standard routine phases which are discussed in detail.

## Planning

This was the initial phase in the project whereby the development team identified the problem that is to be solved by the BTEI GIS software. Necessary observations were made, ideas were devised and eventually the development team came up with user requirements definition. During this stage the team identified resources that were to be used in the development of the system.

The software requirements specification document was developed and can be obtained from any member of the development team.

### Resources

The resources to be used in the development were devised and are as outlined below:

* Human Resources
* Hardware Resources
* Software Resources
* Financial resources

### Human Resources

This category of resources was made up by members of the development team namely:

* Angella Kamera
* Abigail Mwale
* Francis Ganya
* Before Ndakwera

All tasks were shared equally and the team members collaboratively worked together to gather and organize the spatial data that was collected as the work breakdown illustrates.

### Hardware Resources

For certain spatial data the team had to physically travel to the locations of interest to collect coordinates and other spatial attributes. The team used mobile phone devices fitted with GPS modules to acquire the coordinates.

### Software Resources

The GPS hardware module embedded in the mobile device was not of use alone. It had to be used together with other mobile geographic information systems on an android device and windows office tools specifically

* **Google Maps**
* **GPS Coordinates**
* **Microsoft Office Word**
* **Microsoft Office Excel**

### Financial Resources

The development team required internet connectivity to research and use the software applications but also required transport to travel to the several locations whose data required physical collection. As such a certain amount of financial resources were required and contributions were made.

### Target Institutions

A preliminary research was carried out and target institutions to be included in the BTEI GIS were identified as listed:

* The University of Malawi, the Polytechnic
* The Polytechnic Management Development center
* The Polytechnic Continuing Education center
* National College of Information Technology (NACIT)
* Malawi College of accountancy (MCA)
* Blantyre international university (BIU)
* Sanwecka
* College of medicine
* Health Science
* Kamuzu college of nursing
* Skyway
* Malawi institute of tourism
* Malawi Institute of management
* PACT
* Soche Technical College
* Blantyre Teachers College (Soche TTC)
* Kings and Angels – school of designs and tailoring
* Beehive
* LUANAR
* MIJ

### Data Collection Responsibility assignments

After identification of the institutions to acquire data on, each member was given target institutions for which they were responsible for as outlined:

**Collectively by All**

* The University of Malawi, the Polytechnic
* The Polytechnic Management Development Center
* The Polytechnic Continuing Education Center
* Malawi College of accountancy

**Francis Ganya**

* Blantyre international university
* Kamuzu college of nursing
* Beehive
* LUANAR ODL

**Abigail Mwale**

* Malawi Institute of management
* PACT
* Soche Technical college
* Blantyre Teachers college (Soche TTC)
* National College of Information Technology

**Angella Kamera**

* New horizon
* Western college
* Malawi institute of tourism
* Skyway
* MIJ

**Before Gavinala**

* Kings and Angels – school of designs and tailoring
* Sanwecka
* College of medicine
* Health Science

### Scheduling

Following the identification of target institutions and allocation of responsibilities, a schedule of tasks was devised. A list of tasks to be completed was formulated and tallied with team members who were primarily responsible for seeing to it that it was achieved. The table below shows the activities against the team members who were responsible for its completions.

|  |  |  |
| --- | --- | --- |
| Activity | Members | Current Status / Comment |
| Collection Software Installation | Francis Ganya and Before Ndakwera | Software applications were downloaded and installed / Successfully completed |
| Acquisition of finances | All team members | All required funds were collected and internet connectivity was purchased / Successfully completed |
| Training on software use | All team members | All team members were acquainted with the use of the software / Successfully completed |
| Physical Data collection | All team members focusing on their allocated institutions | Team members collected coordinates and spatial data for their assigned institutions /Successfully completed |
| Data entry | Abigail Mwale and Angella Kamera | All collected data was consolidated into a single excel base for further processing / Successfully completed |

## Preparation

Following the acquisition of all necessary resources, the necessary software was installed on the computer laptops and android mobile phones of all team members. Afterwards the team members collected the GPS coordinates and data attributes for each of the assigned institution. Below are excel imports of the data that was collected.



### Attributes Data

The follow attributes for the target institution was collected from various sources including application documents and institutional websites.

* Phone number
* Email
* Postal address
* Location
* Approximate fees
* Programs



The full details of the attributes can be viewed from this attached [file geo-data.xlsx](geo-data%20final.xlsx)

# Digitizing / Transfer

The team used both the data capture and data transfer secondary methods to acquire the GIS data. A majority of the coordinates were obtained on the desk using the google maps and 3 locations had to be physically visited to capture the data as they were not available on google maps. These institutions are namely:

* Skyway
* Sanwecka
* Kings and Angels

Data from both sources was consolidated in the attached excel spreadsheet document coupled with the attributes.

# Editing and Improvement

Taking seriously the importance of having accurate data, the team devised a checklist of data validation tasks that had to be undertaken to ensure consistency, accuracy and completeness.

The development team ensured accuracy by double verifying the GPS coordinates. This was achieved by comparing coordinates retrieved from the 2 GIS systems: Google maps and GPS coordinates. Furthermore, accuracy checks were done by peer review of coordinates collected by team mates.

The whole team collectively verified completeness of the attribute data through consolidation of missing attributes. Data recording was standardized and formatted with a consistent format.

# Evaluation

Finally, the team collectively conducted an evaluation of the projects data collection progress with what was initially planned. It was agreed and concluded that all the items on the project plan were completed and the data collected was of high quality thus it passed the completeness, accuracy and consistency checks that it was subjected to.

The next stage was to construct the geo database structure and populate the collected data to finally map and implement the BTEI GIS.

# Conclusion

This document was an exhaustive report of the data collection process for the implementation of a geographic information system to visualize tertiary education institutions and skills development centers located in the city of Blantyre, Malawi.