

HIGH RESOLUTION BASE MAP: A CASE STUDY OF JNTUH-HYDERABAD CAMPUS

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ABSTRACT

The proposed work “High Resolution Base map: A Case study of JNTUH-Hyderabad. Campus” is based on community mapping concept , where in a number of university from around the world are contributing in the creation of a living Atlas based on the Arc GIS Online cloud platform. The scope of the present campus Base map model can be used to create a high-resolution, multi-scale base map for any university campus. The Base map created as part of this project will become the foundation for a variety of desktop, mobile and web mapping applications deployed to support facilities management, education public works, planning, and security needs. Geo-referencing is the prior task held by giving appropriate co –ordinate systems and projection. The major task held in this project is building the Geo-database model, which holds the data of the various feature classes with in the campus. The Schema of the geo-database model is very important for uploading map onto the community mapping program. Field work and the ground survey are important features in this project. The ground based survey is carried out using Collector for Arc GIS , which is a mobile based application which work with the help of Arc GIS Online and GPS, wherein the collected data is directly loaded onto the map using a option called synchronize. The whole project is carried out using the Arc GIS system, where the Arc GIS Desktop and the Arc GIS online played important in carrying out the process. This online campus Base map can be used by university and the students for their daily decision making. The designed geodatabase can also be used by other researchers and students for building up the designed geo database can also be used by other researchers and students for building up the campus base maps of the Universities. When the final campus base map is built, it can upload in to the community mapping program.

INTRODUCTION

For efficient management and optimal utilization of the facilities and utilities in academic institutions campus, a base map of academic institutions' campus is a pre-requisite. Esri's community maps program represents a cooperative effort by the Arc GIS community to build fast, authoritative maps and layers compiled from premier GIS data sources or derived from remote sensing and developed at multiple levels of details, including map scales as large as 1:1,000. The scale of the map may vary from 1:140 to 1:9,000. The base map facilitates managing campus infrastructure including its enhancement. Furthermore, it also allows users to overlay interior spaces and assets within the building complexes.

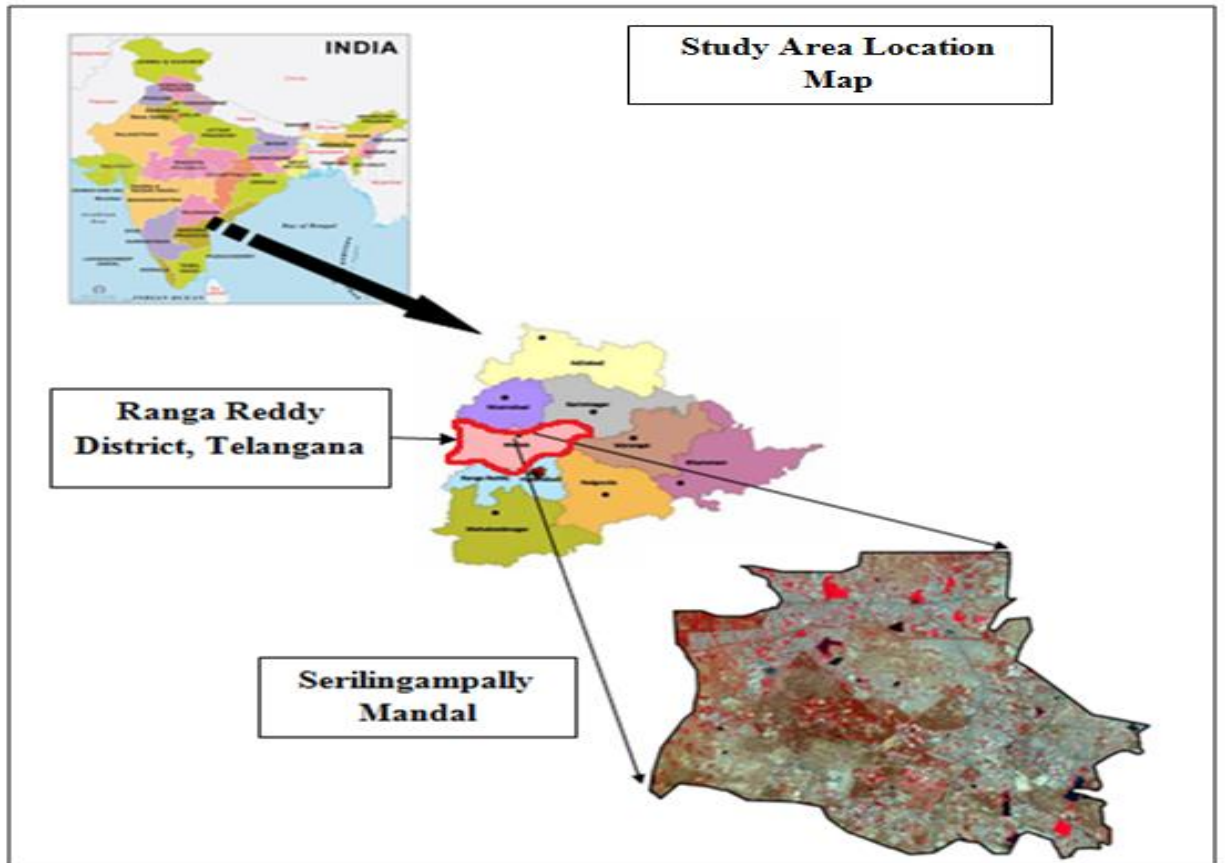
OBJECTIVES

The study aims at designing and developing a high resolution campus base map for JNTUH, Hyderabad, and designing the required geo database and feature dataset/classes. The study was taken up with the following objectives:

- To build a high quality and authentic campus base map which will enable the university authorities to utilize it routinely for its management.
- To provide a consistent geographic context needed across all departments facilities.
- To provide important reference information (building parking areas, sidewalks, fences, etc.) that supports daily decision-making, and
- To build operational layers such as additional infrastructure managed on the campus or interior spaces found within building to support facilities' management and workflows.

Study Area

The current study area is the JNTU Hyderabad campus situated near Kukatpally, which lies at 17.495N Latitude and 78.392E Longitude.

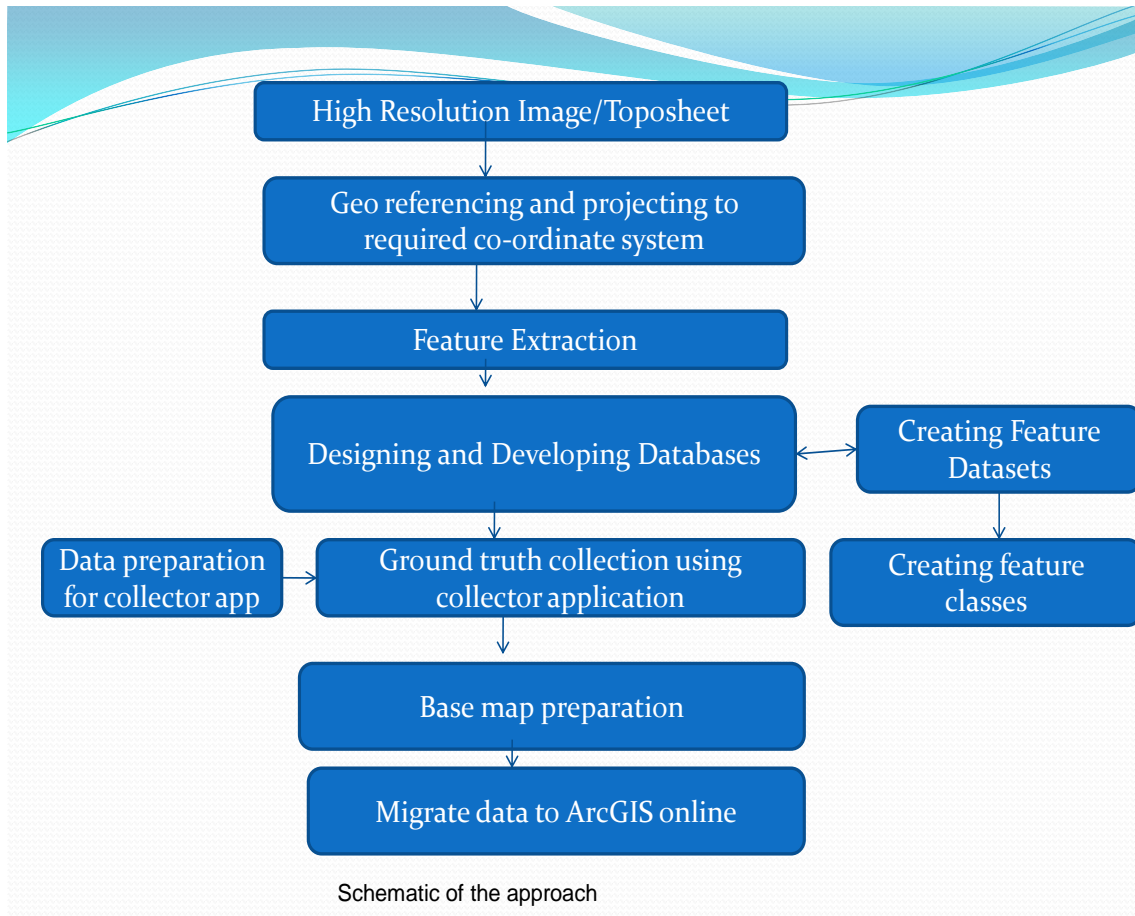


Software Environment

The following software has to be installed and configured:

- Arc GIS Server 10w/SP1 or higher for the Microsoft .NET Framework-standard or Advanced
- Arc GIS Desktop 10w/SP1 or higher – Arc Info or Arc Editor
- Arc GIS Desktop 10w/SP1 or higher-Maplex labeling Extension

METHODOLOGY



RESULTS

FEATURE CLASSES

Feature classes are homogeneous collections of common features, each having the same spatial representation such as points, lines, or polygons, and a common set of attribute columns, for example, a line feature class for representing road centerlines. The four most commonly used feature class in the geodatabase are points, lines, polygon and annotation (The geodatabase name for map text).

The various feature classes built for the JNTU-Hyderabad campus are given below, the different feature classes captured on ARC Map, by digitizing them. We have different types of feature in a campus area like points, polyline, polygon,etc.

FEATURE CLASSES OF THE CAMPUS

Data layers	Feature Geometry
Administrative Boundaries	Line
Building Footprints	Polygon
Elevation (DEM)	Raster
Imagery	Raster
Lakes and ponds	Polygon/Line
Landmarks and Points of Interests(POI)	Polygon/Points
Landscape Areas	Polygon
Parcels	Polygon
Parking Lots	Polygon
Pavement Line (e.g. parking lot spaces)	Line
Pavement Marking Lines	Line
Pavement Marking Points	Points
Road Centerlines	Line
Sidewalks and walkways	Polygon
Site Amenity Lines	Line
Sports Fields and courts	Polygon
Spot Elevation	Point
Street Pavements	Point
Tress	Point



Feature classes in part of the JNTU campus

Managing the published Data on Arc GIS Online

After uploading the content onto the ARC GIS online we need to manage/edit the data to carryout the further processing. Using ARC GIS online service we can upload the final maps/documents that could be shared with other concerned users. It can also be used to create and manage services, maps, layers and features for collector for ARC GIS application on smart phone and Tablet device

CONCLUSIONS

- The study has vividly demonstrated the utility of ArcGIS server in developing online base map of an academic institution campus. The unique feature of this base map is the provision to share the information with other concerned authorized users. The online campus base map, thus generated, can be used by university management /university authorities for efficient management and utilization of infrastructure, facilities, utilities. The other usage of the campus base map include the following
- Optimal and alternative routing for approaching a particular facility within the campus.
Identification of location of a particular office within the campus.

The limitations of the current online campus base map include

- The current Campus base map methodology can be worked only on the ArcGIS10.1 version and above.
- Since ArcGIS is not an open source software, it's always difficult to update with the current version.
- The concept of online campus base map is still in developmental stage in Indian.
- Precise location and Offline mode of Collector for ArcGIS with high accuracy are other note worthy limitations.