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USING GIS TECHNOLOGY INTEGRATED MAPPING OF ALL UTILITIES FOR MIDC INDUSTRIAL AREA

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Abstract : The key to successful administration is using Geographic Information Systems to integrate a wide range of utilities, assets, users, and geography. Regulation, operation and maintenance of particular towns, industrial zones and commercial zones with GIS integration. We can better visualize our data and keep in control of every aspect in every way we can in the locality. GIS helps water, Sewers and other underground utilities to authorities to overcome difficulties in the field and operational and maintenance challenges for effective decision making. In town planning, the third dimension plays a unique and important role. Using the GIS, modeling provides flexible interactive data that is unique to planners while providing one of the best data representations for planning and decision making. Main goal is to improve real-time troubleshooting, problem identification system on a centralized server for efficient operation, maintenance and expansion using GIS dataset. Consumer mapping, topographic mapping, an integrated way through the integration of spatial data, ground verification and final analysis. DGPS and Drone Survey, CAD maps, inserted into the GIS will guarantee precise and sufficient information and data for efficient management. This project had been carried out for SEEPZ in Andheri. The process of conceptual mapping and database conversion employing consumer surveys, DGPS, and drone surveys, as well as CAD maps put into a GIS, will provide for accurate and comprehensive data and analysis for appropriate management.

IndexTerms - GIS, Utility, Interactive data, Topographic mapping, DGPS.

I. INTRODUCTION

A responsible area's advancement requires expansive, subtle, and constantly updated spatial features, as well as the problem-solving skills to put that information into action. As a result of this conundrum, GIST has shown to be extremely useful to urban planners. Experts in GIS use spatial reasoning to transform contiguous data into useful information and solutions, pointing the way to bettering quality of life and establishing sustainable cities. Every municipal organization or any administration body which deals with consumer, Information in contiguous representations is required for services. Many municipalities still don't have physical copies of existing utility maps and assets which becomes tedious to uniquely locate on site Assets or utilities. On the other side this organization faces a significant daily challenge for operating and maintaining the network and increasing their productivity. The ability to better identify existing demands for a city and then design to meet those needs is one of the reasons why GIS is significant in urban planning. By analyzing geospatial data via satellite imagery, aerial photos, and remote sensors, users can gain a comprehensive view of ground and structures. The capability of GIS to bring up enormous amounts of data in order to reconcile competing goals and solve complex challenges is becoming increasingly important as urban populations grow and spread. Civil engineering would certainly progress as a result of this.

1.1 Characteristics of existing system

1. There is no mention of any attribute information relating to the Condition or the Location Asset.
2. Manuals and worksheets are used to keep track of the information which is in Hard Copy.
3. No Provision for Deletion / Updating of any Record-Only addition is Possible.
4. Spatial location of Assets, Utilities, and consumer is missing.
5. Maps are Inaccessible-stored at different locations and too hard to Understand.

1.2 Objectives

The major goal is to build and integrate a GIS-based monitoring and management system that will aid in the development of schematic maps. The detail objectives are as follows:

1. An examination of the current management system.
2. The creation of a data base for a Geospatial integrated solution framework.
3. On-the-ground data gathering and verification for utility, asset, and customer mapping in a given area.
4. Using GIS, customize and integrate local data.
5. Centralizing data for accebility of use, maintenance and future development.

II. LITERATURE REVIEW

Mohammed Al-Ahmari 21st January, 2006 to gather information on groundwater contamination in agricultural areas and find out how GIS was applied in these studies. . Utilize Geospatial techniques, assess nutrition and agrochemicals leaching only at field scale and interpolate the outcomes to the watershed level.

Mohan M. Venigalla, 5th September 2007 various fundamental engineering operations have discovered that a geographic information system (GIS) is the best foundation for addressing their demands. This study demonstrates the usefulness of a basic strategy for generating EMSFs on the GIS platform.

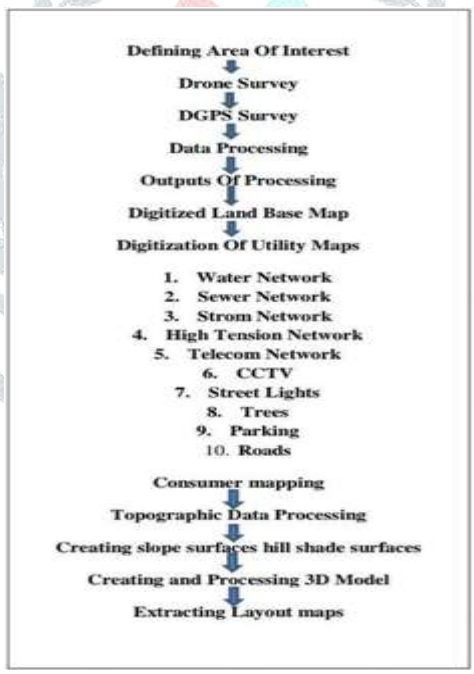
M.V. Krishna Rao; B.S. Varma; 12th August 2008 GIS is a useful tool for visualizing distribution networks as they exist on the ground. The planning engineer can use GIS-based electrical transmission network modeling and analysis tools to visualize low voltage and high loss areas in planning mode.

Salah Muamer Aburawe, Ahmed Rodzi Mahmud January 2011 the leakage size and location in the pipe network were SCADA is used to forecast that components are influenced by pressure and flow). WATERGEMs were used to design the pipelines.

Rajesh Kumar J. Ajwaliya September 2014 SAC (ISRO) can be applied in a variety of ways of improving planning, according to the findings of this case analysis. Maintenance and management standards. The developed utility management system may provide a wide range of data for various types of analysis to enable routine maintenance and management.

Anuj Bariar, R.D. Gupta, C. Prasad September 2014 A GIS based spatial data infrastructure has been developed for a part of Allahabad District in the present work for planners and decision-maker for making more informed decisions about future development projects.

III. METHODOLOGY



3.1 Study Area

The SEEPZ, Andheri is a Special Economic Zone in Mumbai, India. Situated in the Andheri East of Maharashtra. The study area lies between 19° 123' N, 72° 876' E. It is an area of 18.71 Hectares and about 410 Industries as per the Consumer Survey connected by us. SEEPZ, Andheri is 31 meters above the sea level on average. The step-by-step procedure for creating an integrated mapping of MIDCs SEEPZ shown in fig 1.

(Fig 1, Area of interest of Seepz, Andheri.)

3.2 Defining Area of Interest

Identifying the administrative boundaries of SEEPZ, Andheri through a consultative process with authorities, and locating local landmarks and important centers**.**

3.3 Drone Survey

Drone flying at an altitude of 80 meters to capture high-resolution ortho images, DSM and DTM of SEEPZ, Andheri of 2cm precession.

3.4 Data Processing

After capturing Drone Images and DGPS data points, Data is processed for nearly 6 to 7 hours for obtaining the required outputs.

3.5 Digitized Land Base Maps

On entering the following data into ArcGIS, the digitized Base map was created, which included Landmarks, Boundaries, Open Spaces, and Ward Boundaries.

3.6 Digitization of Assets

By identifying assets on the field, these had been connected and uniquely determined on ArcGIS, the Digitization platform by creating Shape file was done and attribute table was formed by information collected by on ground realities.

3.7 Digitization of Utilities

On the surface, existing utilities infrastructures was investigated and verified. As a result, the previously created AutoCAD designs were Geo-referenced, and Base maps were created.

3.8 Consumer Mapping

Door to Door Consumer Survey was carried out at complete SEEPZ area to get the updated current information and status of area. ArcGIS was used to connect all of the data in a well-organized way.

3.9 Topographic Data

Processing Contours were formed after the DGPS data was processed, and undesired Contours were eliminated and refined. Topographic data was then evaluated for slope estimates. To identify the sources of water-logging and effectively manage utility systems, contour cleaning, vector surfaces of Hill hues, and slopes were generated.

3.10 3D Modeling

The third dimension is becoming highly significant in city planning and management. 3D GIS modeling provide a flexible interactive system with one of the greatest analysis practices of data, aiding municipal administrators in their decision-making and planning procedures As a result, three dimensional GIS has become more widely used. The model conveys topographical elements in a simple manner, enhancing projects processing and control through 3D visualization.

3.11 Extracting Layout Maps

Maps act as a framework for the data structures and analytics that you want to use. GIS maps are simple to publish and incorporate in apps, and they are available to almost everyone, everywhere. Layout maps of ArcGIS gives far more realistic experience than AutoCAD maps, and gives Real time interpretation in quick time. Because GIS mapping technology enables you to toggle data layers on and off, you may use it to either focus on certain data pieces or see novel combinations of information.

IV. APPLICATION

Infrastructures, such as water supply, road network, and communications networks, among many other things, has a substantial impact on a society's life satisfaction. Assets can be queried based on their proximity. Tables provide the details for every utility system. Each service infrastructure's material, size, and length can be determined by clicking on multiple spots in each locality. GIS

Query can be used to identify areas of damage, nearby utilities, and road specifications, which might be important for SEEPZ, Andheri's future expansion and day-to-day operations.

V. RESULTS

MIDCs and SEEPZ in Andheri were mapped with Arc Map, and the 3D processing of the model was done in Arc Scene for improved optimization, visualization, and layman understanding. There were 410 industrial units, each with a water and telecommunications supply. On the ground, the Utility Network was assigned a unique number and was identified as such. For each Utility of Scale 1:20 (i.e. 1Cm=20meters), Layout Maps were created. A total of 8 utilities were mapped, as well as 410 consumer units and a contour map of the area made by mapping Assets on it. For a quicker realistic solution for recognizing localities on the ground and solving problems in a timely way, 3D modeling with mapping of all services and users was used.

(Fig 2, GIS based integrated mapping of SEEPZ, Andheri.)

VI. CONCLUSION

MIDC SEEPZ, Andheri has developed a GIS model to manage utilities and assets. The designed utility management system could give a large amount of data for various types of analysis, allowing for regular maintenance and administration. The potential of GIS to integrate data and develop it for study, but also connecting data from many sources, proves to be very helpful for organizing and making decisions. For precise map understanding, the user can obtain a legend of all layers presented on the map. The data-set will indicate the actual cursor position's distinctive coordinates, and the value of As the mouse cursor moves throughout the inquiry area, the unique co-ordinate will change. The coordinates are only visible while the mouse cursor is within the map region. In the complete MIDCs SEEPZ, Andheri, we can evaluate the length of cables, roadways, water network, Sewer network, and High Tension network from one location to another. Any layer of the GIS map can be accessed to obtain associated data for a specific feature of that layer. To retrieve the associated table for any feature of a given layer, the user must click on it. GIS offers a comprehensive range of services, including network setup and demand - side management, as well as client information, asset management, accounting, and customer support. The computer program allows for the rapid, precise, and simple acquisition of data and analysis, which is critical for making efficient and optimal judgments.

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