



Xinthe

Technologies

ISO 9001:2008

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Xinthe GIS and Remote Sensing Services Case Studies

IMAGE PROCESSING

- Thematic mapping
 - Land use/Land cover mapping
 - Geomorphology mapping
 - Soil mapping
 - Forest mapping
 - Disaster management studies
- Geo-rectification/Geo-referencing
- 3D Modeling
- Mosaic services

PHOTOGRAMMETRY

- Aerial Triangulation
- Ortho image generation
- DEM generation
- 3D data capturing

DATA CONVERSION

- Raster to Vector conversions
- Feature capturing from high resolution satellite images & Ortho

DATA MIGRATION & INTEGRATION

- Legacy Migration
- Enterprise, Platform, Technology and Application
- Integration



India | USA | Bahrain | Africa | Europe



Programming Team:

Our team comprises of able programmers possessing knowledge of,

Languages: C++, VC++, Visual Basic, HTML, Java, .NET and Android

Database: SQL server, Sybase, Oracle, MS Access and Auto Lisp.

GIS Development: Arc Objects, Visual Lisp, ArcGIS APIs for JavaScript and .NET.

GIS & Remote Sensing Team:

GIS: Our GIS staff is well versed with various GIS software and have expertise on image interpretation, image processing, digitization, geo-coding, thematic mapping, along with database management and programming. They have completed projects involving facilities planning, project coordination and map making.

Cad Team:

We have a very competent CAD team capable of readily undertaking challenges thrown by modern sophisticated technology. It consists of enterprising engineers and draftsman who have extensive experience in the engineering field & GIS and who firmly believe in teamwork.

Technologies and Software used in GIS & Remote Sensing:

AutoCAD, ArcGIS, Erdas, ENVI, EASI/PACE and Socketset



Case Study 1: Landbase map creation for GVMC area

Client: Greater Visakhapatnam Municipal Corporation, Visakhapatnam

Description: Visakhapatnam Municipal Corporation (VMC) becomes Greater

Visakhapatnam Municipal Corporation in the year 2006 by amalgamation of 32 adjacent villages to the existing area. GVMC wanted to prepare new landbase map for these new 32 villages and merge with existing data. It was proposed to capture the data with the help of latest high resolution QuickBird satellite image. Satellite data was interpreted and developed base map in various layers like Road network, Rail network, Building foot prints, Land use/Land cover, water bodies, Land marks, ward boundaries, zone boundaries individual trees etc. Contours of 5 meter interval were developed with the help of Cartosat stereo pair data. Cadastral maps of the GVMC area were scanned, Geo-rectified, digitized and integrated with the base map. Customized tool was developed for map view, query and retrieval.



Scope:

The activities taken up for the project were

1. Selection and procurement of Satellite data
2. DGPS survey and Geo-rectification of satellite data
3. Image processing and
4. Creation of base map with heads up digitization
5. Scanning , Geo-rectification, Digitization & integration of cadastral map data
6. Generation of contour data from cartosat image through photogrammetry techniques
7. Symbol creation, Map composition & printing
8. Software customization
9. Training to staff





Methodology:

Entire project is divided into different phases based on activity. A cloud free latest satellite imagery was ordered for the AOI. A DGPS survey was conducted to capture GCP locations and these were used to geo-reference the image. Geo-rectification was carried out using ERDAS Imagine software.

After completion of orientation training to the internal staff, feature extraction was carried out and land base map was generated. Land marks were identified with the help of hand held GPS and field sketches and these were incorporated in to the basemap.

Cadastral maps and survey maps were scanned and Geo-rectified with the help of satellite images. After rectification digitization was carried out to create base map data. Contours with 5 m interval were developed by using Cartosat stereo pair data. Aerial triangulation and orientation was done with camera calibration files and DEM was generated. Contours were generated from DEM.

Finally all the vector files were mosaiced and converted to the shape file format and geodatabase format.



Implemented Location: Viskahapatnam, India

Resource Base:

Total number of Cadastral Maps Digitized in the project	90
Total number of villages geo referenced	45
Total number employee deployed for the project	25
Total number of computers, scanners and plotters used in the project	Computers: 30 A-0 Scanner: 1 A-0 Plotter: 1
Name of software used in the project	AutoCAD map 2004, ERDAS 8.1, MapInfo 8.0



Particulars of Contract:

Project Value (INR)	Rs. 81,39,060.00
Date of award	2 nd August 2006
Project duration	Phase-1: 10 th Aug 2006 to 27 th April 2007 Phase-2: Nov 2007 to April 2008
Remarks	9 th September 2009
Client contact Details	Commissioner, GVMC, Visakhapatnam Chief City Planner Mr. Raghu 9848308827





Case Study 2: Coalnet, Kharagpuetr

Client: IIT, Kharagpur

Description: The main aim of this project was creation of geo database for the surface plans & master plans of Jharia coal fields. These map data would be integrated with the MIS system developing by the IIT Kharagpur and Coal India Ltd. Hard copy maps of surface plans and master plans maps were collected, scanned, geo-rectified and generated vector data in different layers. This vector data was converted to shape files and further converted to oracle spatial datable.

Scope:

1. Scanning of Hard copy maps
2. Geo-rectification of scanned maps
3. Digitization of scanned maps in different layers.
4. Ground truthing of the said layers.
5. Creation of database in Oracle 10g
6. Demonstration of converted maps in Oracle 10g to the IIT Project personnel.



Methodology:

All the input maps were scanned and obtained raster images, thus scanned maps were geo-rectified with help of Survey of India topomaps and Ground Control Points (GCP) obtained through GPS. Since rapid change of the road and other features in the mine locations GPS points in combination with SOI topomaps are used for improving accuracy in geo-rectification.

SOI topo sheets of 1:25000 and 1:50000 were rectified and these are used as reference image for rectification. GCPs are also collected in the field with highly accurate handheld GPS where topo sheets are not alone sufficient.

The registered maps were exported to geoTIFF formats on which digitisation was done using AutoCAD in dwg format, features captured include quarry, goaf, coal seams, coal dump inclines, faults, shafts, road network, rail network, water bodies etc. The final maps were then converted to shape (.shp) file format and corresponding attribute data is added to the features. Finally spatial database was created in Oracle 10g by importing all the shape files and demonstrated to the client by making various spatial queries with this database.





Implemented Location: Kharagapur and Ranchi, India

Resource Base:

Total number employee deployed for the project	10
Total number of computers, scanners and plotters used in the project	Computers: 15 A-0 Scanner: 1 A-0 Plotter: 1
Name of software used in the project	AutoCAD map 2004, ERDAS 8.1, Arc GIS 9.0 & Oracle 10g



Particulars of Contract:

Project Value (INR)	Rs. 53,62, 000.00
Date of award	16 th July' 2004
Project duration	Sept 2004 / 2005 (extended till March 2007)
Remarks	March 2007
Client contact Details	IIT, Kaharaghpur , WB





Case Study 3: REIS, NY

Client: Land base creation for REIS, NY

Description: Vector data creation from Ortho-photo & Integration of Town/Village Cadastral Maps (2172 Sq. Km) for Orange County, NY State, USA, 20 Towns & 132 Village Parcel Maps digitization on 1: 1200 scale. Total GIS database creation with 96 layers, attribution, annotations, geo-database creation.

Scope:

1. Input data verification
2. ECW to Geo-tiff conversion
3. Digitization
4. Geo-rectification of cadastral data
5. Digitization of parcels
6. Integration of parcel data

Methodology:

The registered maps were exported to GeoTIFF formats on which digitisation was The input orthophotographs supplied in ECW format were converted into GeoTIFF format and these geotiff's were used for digitization in AutoCAD environment. Information derived from ortho photographs was made into 54 layers like Paved road, Paved shoulder, Unpaved road, Major trail, Fence line, Major stream, Wooded area Hedge row, Tree row, Deciduous tree, Coniferous tree, Athletic field, Building, Patio Deck, Pool, Shed, Mail box, Railway line, Power transmission line, Light pole, Driveway, Parking area etc. Digitization errors were removed and topology was created in AutoCAD map.

Property lines (Parcels) were generated for the entire town area from the cadastral maps and integrated with the derived data.

These cadastral maps were geo-referenced with available tics in the map and orthophotographs.





Implemented Location: Orange County, NY, USA

Resource Base:

Total number of Cadastral Maps Digitized in the project	20 Towns & 132 Village Cadastral/ Parcel Maps digitization on 1: 1200 scale.
Total number employee deployed for the project	25
Total number of computers, scanners and plotters used in the project	Computers: 30 A-0 Scanner: 1 A-0 Plotter: 1
Name of software used in the project	AutoCAD map 2004, Arc GIS 9.0, Global Mapper



Particulars of Contract:

Project Value (INR)	Rs. 55,00, 000.00
Date of award	Feb 2006
Project duration	Feb 2006 to Aug 2007
Remarks	Completed successfully in March 2007
Client contact Details	Mr Dave Washburn, President REIS 137 Oakland Ave., Suite 1-B Email: washburn@bestweb.net Phone/Fax: (845) 782-4979





Case Study 4: GIS Services for HDMC

Client: HDMC, Hubli Dharward, Karnataka

Description: Main objective of the project is VTS implementation with GIS interface & Maps for HDMC. On-line Vehicle Tracking System (VTS) was implemented for garbage trucks & other hired vehicles of HDMC. Vehicles were fitted with GPS system & Sym cards; data is transformed to central server for every 10 seconds from the vehicle and generated day wise trip reports along with bins lifted information.

An application was developed with GIS interface for viewing maps and track the route of the vehicle. City GIS maps were developed along with land marks and bin locations.

Scope:

Activities performed in the project are

1. Needs assessment
2. Application design
3. Application development
4. Creation of city base maps
5. Testing of Sym cards
6. Collection of bin location
7. Hardware supply
8. Implementation of the project

Methodology:

A VTS application was developed after careful analysis of the requirements of HDMC. Application was developed in .net environment and SQL server as database system. Functionality includes Map view, Pan, Zoom, Add bins, Add land marks, view vehicle traverse route on the map, month wise distance report generation, stop reports etc. City maps were prepared from existing plans, bin locations were collected with high precision GPS.

Online monitoring of the vehicles is the aspect in the project and a control center was established at HDMC premises to track the vehicle movement.

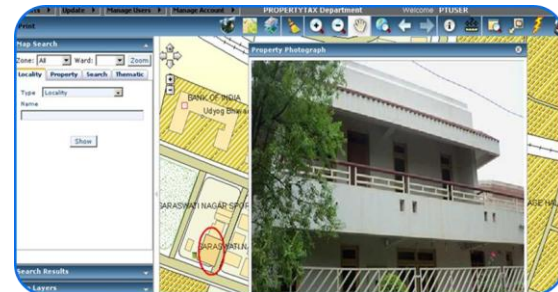




Implemented Location: Hubli and Dharwad, Karnataka

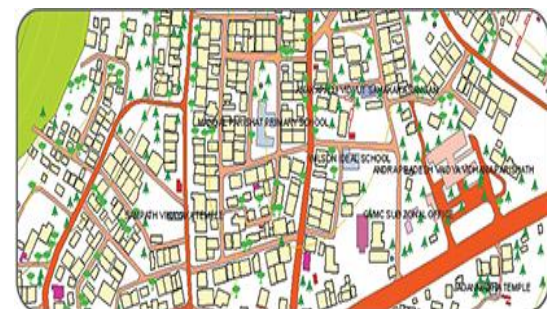
Resource Base:

Total number of Cadastral Maps Digitized in the project	12 villages for the HDMC (134 Sq Km)
Total number employee deployed for the project	15
Total number of computers, scanners and plotters used in the project	Computers: 8 A-0 Scanner: 1 A-0 Plotter: 1
Name of software used in the project	AutoCAD map 2004, Arc GIS 9.0, ERDAS 8.1



Particulars of Contract:

Project Value (INR)	Rs. 97,10,000.00
Date of award	Aug 2006
Project duration	Aug 2006 to April 2007
Remarks	Completed successfully in April 2007
Client contact Details	Commissioner, Hubli-Dharwad Municipal Corporation, Hubli





Case Study 5: Creation of Spatial Database (Digitization) of Maps

Client: Commissioner Land Records, Govt. of MP, Gwalior

Description: Commissionerate of Land Records & Settlements, M.P has decided to create digital cadastral database for the entire state of Madhya Pradesh with the help of central funds. This project had tasks ranging from collection of input maps to getting verification of printed sheets from patwari. For better administration of the project tasks have been divided as onsite and offsite activities and according resources are allocated.

Every map sheet is identified with a unique 16 digit number. Scanned image, rectified image, Raster check prints, vector check prints, Raster archive print, Vector Archive print and vector data in DWG, Shape file /Geo-database are the deliverables of the project .

Around 40000 sheets in 2 divisions have been allocated to Xinthe.

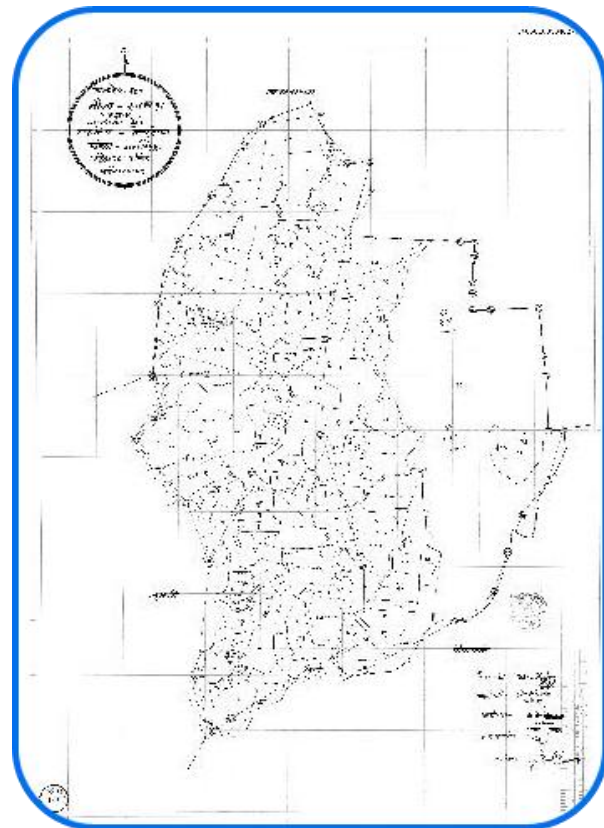
Scope:

Activities involved in this project is listed bellow

1. Collection of input sheets
2. Scanning
3. Indexing with 16 digit number
4. Grid reference
5. De-speckling
6. Raster QC
7. Digitization & Annotation
8. Vector QC
9. Verification of check prints
10. Incorporation of updates / corrections
11. Q.A
12. Archive printing
13. Village wise mosaic
14. Geodatabase creation
15. Training to revenue staff at district level

Methodology:

Methodology adopted for this project is described bellow briefly.





Master Database creation: Village list master database was created for the allocated districts in SQL server. This database is using for completeness of input collection and indexing.

Scanning: This task is carrying out at SLR office of each district. Output is creating in tiff format with 300 DPI in grey scale mode. Grey scale mode preserves minute details wit out any information loss

Indexing: 16 digit unique number (unique in entire state) consists of District, Tehasil, Patwari halka, Village and Sheet number is assigned to every sheet with the aid of specially designed software. Facility was created to make file name with index number, stored in specific location and SQL database is update with the record automatically. Thus this file available for the subsequent tasks like despeckling, gird reference, digitization etc.

Grid reference: Scanned tiff file is grid referenced by using standard 1 inch grid developed in AutoCAD with the aid of AutoCAD software.

De-Speckling: This task is performed for removing noise such as fold marks, torn marks and others. Adobe Photoshop is using for this task.

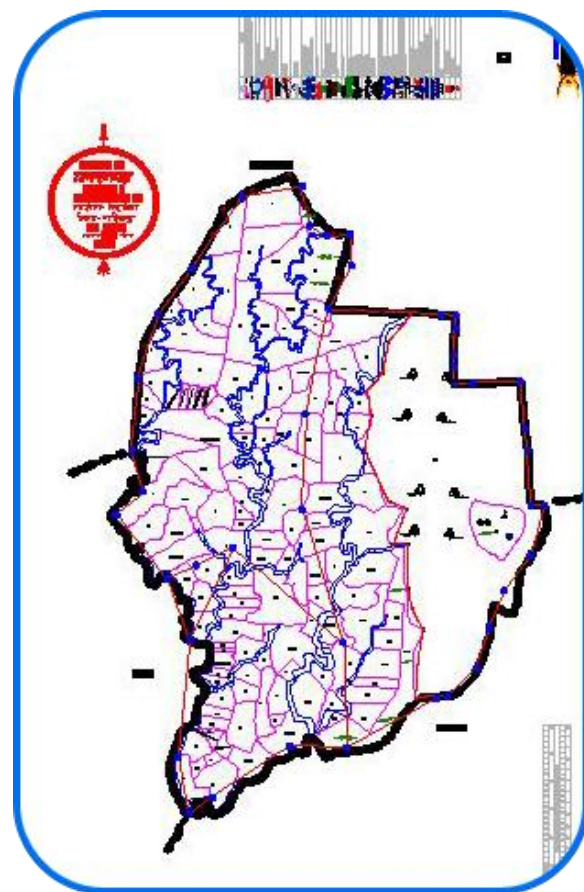
Digitization: Digitization includes tasks like line work, annotation, placing symbols, placing title blocks, cleaning to remove digitization errors etc. special AutoCAD LISP programs were created to maintain data accuracy and integrity. AutoCAD map software is using for digitization.

Quality Control: To maintain the quality of the data, QC is implementing at each and every stage. Special tools were created for auto checking of errors and manual checking is employed for certain cases only manual intervention is required. QC is done at completion of De-speckling task and digitization task. QA will be done at after verification of check prints by client and updation of comments.

Check prints verification: Raster check print is submitted to check the correct ness of scanning and vector check prints will be provide to verify digitization accuracy. Both these check print will be verified by the client representative at district level.

Updation: After verification of Raster and Vector check prints corrections/errors found out in checking will be eliminated by updating data files generated.

Archive Printing: Final printing will be made on 75 Micron matt polyester film. This printing is made sheet wise.





Mosaic: Mosaic is made for those villages having more than 1 sheet. Edge matching is done to make data integrity.

Geo-database creation: Once all the activities are completed data is exported to the shape file and Geodatabase will be created.

Training: Training is conducted at district to the revenue officers to perform updation, modification, deletion, querying, printing etc activities.

Language: Hindi is the language used for all the maps. C-DAC ISM publisher software is used to create complex annotation.

Deliverables: Following are the deliverable of the project.

1. Scanned maps (Tiff)
2. De-speckled maps (tiff)
3. Raster and Vector check print
4. Raster archive print
5. Vector check and Archive print
6. Vector data in DWG, DXF and ESRI shape file or Geodatabase format.
7. Training

Implemented Location:

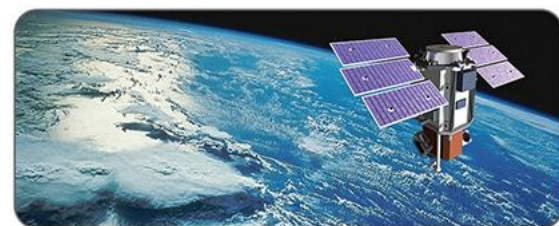
13 Districts of Jabalpur and Sagar Divisions in Madhyaradesh.

Resource Base:

Total number of Cadastral Maps Digitized in the project	42511
Total number employee deployed for the project	110
Total number of computers, scanners and plotters used in the project	Computers: 120 A-0 Scanner: 4 A-0 Plotter: 6
Name of software used in the project	AutoCAD map Series 2008, Adobe Photoshop

Particulars of Contract:

Project Value (INR)	Rs. 5,21,04,389.00
Date of award	5 th April 2008
Project duration	May 2008 to Aug 2010
Remarks	Successfully completed with maintenance
Client contact Details	Mr.Vindo Kumar Singh Deputy Commissioner O/o. The Commisioner, Land Records,MP Moti Mahal, Gwalior. Ph.:+91-94253-38594





Case Study 6: Comprehensive GIS for GVMC, Visakhapatnam

Client: Greater Visakhapatnam Municipal Corporation, Visakhapatnam

Description: Implemented a Comprehensive property survey and GIS mapping project for GVMC which includes mapping of all Civic Services offered to households and also developing and implementing an appropriate Door Numbering System, by rationalization of existing door numbering system for all houses in the City of Vishakhapatnam. GIS mapping will enhance the decision making capabilities of the GVMC officers and benefit to the departments of Revenue, Town Planning, and Public Health etc. Making centralized database is the key component for this enterprise system; this eliminates data redundancy and make available of current version of data to all the departments

Scope:

The activities taken up for the project were

1. Property Survey
2. Electrical network survey
3. Door Numbering System
4. Installation door number plates
5. Installation of street sign boards
6. Integration of existing network data with base map
7. Supply of software
8. Supply of hardware
9. GIS application development
10. Annual maintenance for one year
11. Training to GVMC officials

Methodology:

Satellite Image – 0.5 M resolution for 32 villages and Gajuwaka municipality areas Aerial photographs - 0.5 M resolution for core city Details like Roads, Railway lines, Building footprints, and water bodies, Land Use/Land Cover were mapped and made seam less mosaic of entire city.

After creation of base map, a detailed fieldwork was undertaken to create attribute data for the entire GVMC 72 wards with the GVMC approved form.

Utility network data creation for all 72 wards4 Web based GIS application development using .NET with ArcGIS Server API 9.3.1.





Implemented Location: GVMC IT Cell

Resource Base:

Total number of Cadastral Maps Digitized in the project	
Total number employee deployed for the project	60
Total number of computers, scanners and plotters used in the project	Computers: 50
Name of software used in the project	AutoCAD map 2004, Arc GIS Server 9.3.1.NET, ERDAS 8.1, Oracle 11g

Particulars of Contract:

Project Value (INR)	Rs. 3,49,60,000.00
Date of award	21 st Apr 2008
Project duration	Apr 2008 to April 2012
Remarks	Completed successfully in September 2014 with Maintenance
Client contact Details	Commissioner, GVMC





Case Study 7: Visibility Analysis, Visakhapatnam

Client: Scetaroute International, France

Description: Main objective of this project is generation of a Visibility map along the highway of A63 located in the boarder of France and Spain. DEM has been generated along the highway by projecting the Topographic files, Woods and Buildings.

A visibility map gives us a clear picture about the area, which is visible to a person when standing at a point considering the topography of the area. The requirements for the project are obtained from the client through a series of meetings and discussions, and simultaneously going through the existing versions of the software and getting to know its functionality. A Requirements definition document is prepared which includes all major and sub requirements.

Scope:

The data provided by the client has elevation information within it. The Layer '20' which is otherwise called as Level lines (Contours) stores information about the elevation. Taking this into consideration DEM has been generated and from the DEM a View shed analysis report has been developed. Customization has done to facilitate dynamic selection of observation point.

Methodology:

Contour data was provided by the client and the application was developed using VB6 and Map objects.

The map of visibility in a grid format containing information ' visible' - ' not visible' for each cell the number of points of the axis seeing the cell

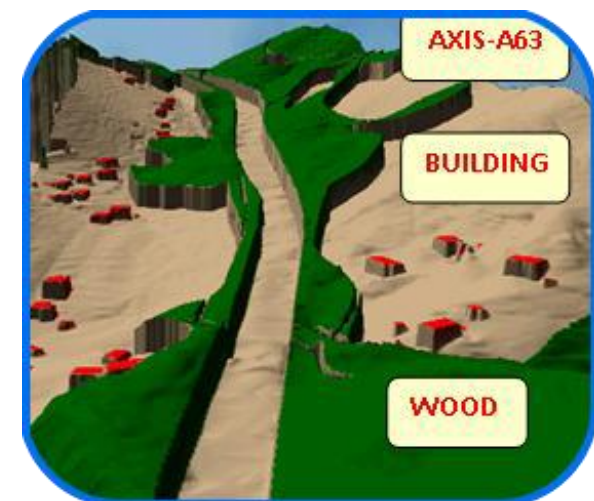
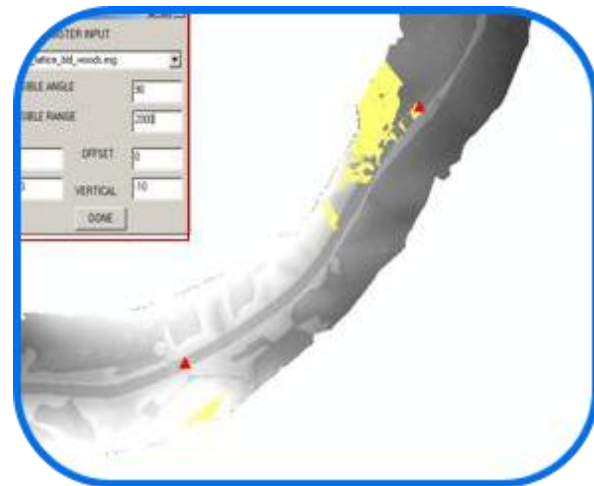
Implemented Location: Xinthe's Premises

Resource Base:

Total number employee deployed for the project	4
Total number of computers	4
Name of software used in the project	VB and MapBasic

Particulars of Contract:

Project Value (INR)	Rs. 6,40,000.00
Date of award	Jun 2006
Project duration	Aug 2006
Remarks	Completed successfully
Client contact Details	Scetaroute International, France





Case Study 8: Comprehensive GIS Application Development

Client: SMKMC, Sangli

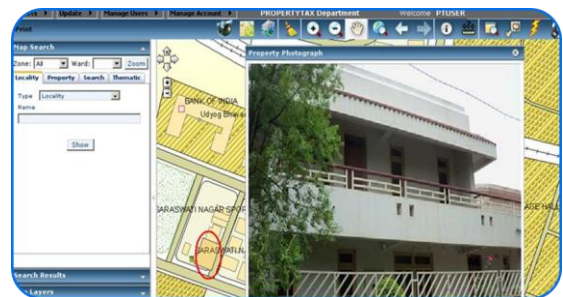
Description: A comprehensive enterprise wide GIS application intended and developed for SMKMC which is being used as a productive tool as an intelligent Decision Support System.

Scope:

- I. Creation of final up to date Base map preparation.
 - a. Processing of Satellite image
 - b. Preparation of base map with city survey maps, land use map, revenue maps etc.
 - c. Additional maps for
 - i. Property tax
 - ii. Water Supply
 - iii. Town Planning
 - iv. PWD
 - v. Health Planning
 - vi. Drainage
 - d. Collection of Attribute information for Property tax
 - e. Creation of database and integration with land base map
- II. Software platform to run GIS software
 - a. To supply and install GIS platform software – ArcGIS server Enterprise edition
 - b. Training
- III. Customize GIS Application software
 - a. Application software development and Installation
 - b. UAT (User Acceptance Test)
 - c. Training

Methodology:

1. SRS Preparation and submission
2. Field survey data sheet design and approval
3. Satellite image procurement and processing
4. Source map collection
5. Base map preparation
6. Field survey



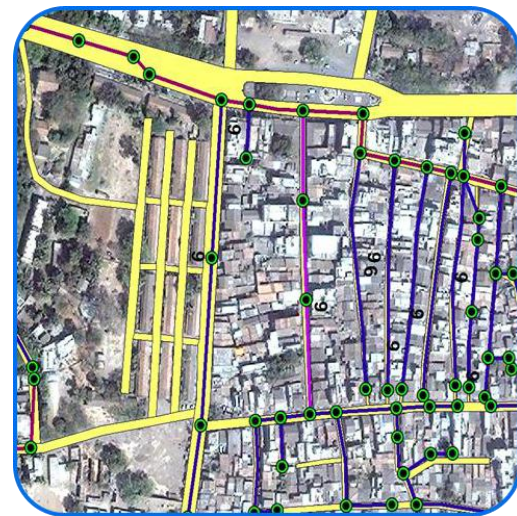


7. Submission of base map
8. Submission of field survey data
9. Application development and installation
10. UAT
11. Training

Implemented Location: SMKMC IT Cell

Resource Base:

Total number of Cadastral Maps Digitized in the project	
Total number employee deployed for the project	45
Total number of computers, scanners and plotters used in the project	Computers: 40 A-0 Scanner: 0 A-0 Plotter: 0
Name of software used in the project	AutoCAD map 2004, Arc GIS Server 9.3.1.NET, ERDAS 8.1, Oracle 11g



Particulars of Contract:

Project Value (INR)	Rs. 1,33,00,000.00
Date of award	27 th Aug 2010
Project duration	Dec 2010 to Apr 2012
Remarks	Completed successfully and is under Maintenance for another 3 years
Client contact Details	IT Head, SMKMC, Sangli. Mr.Nakul Jakate Phone:91-233-2373721/22/23





Case Study 9: Android Application Development for Mobile GIS Data Collection

Client: Forest Department, Madhya Pradesh

Description: Developing a native Android mobile application, to map and capture assets, work sites and update work site progress, utilizing GPS and GIS data. The captured data will later be uploaded to a server where centralized spatial data is stored.

Scope:

1. Downloading the respective master data along with the map using existing XML web service
2. Uploading the collected information to the server using the existing XML web service.
3. Using GPS, collecting the coordinates of the Assets, Work sites, taking photographs or video of the same, giving some text input and saving the data along with the time and date stamp
4. The GPS coordinates will be taken using 2 methods – Averaging and Streaming.
5. Updating the work site progress by giving Physical and Financial progress. This functionality includes taking photographs or video of the progress along with giving some text input.
6. Storing all the data in the mobile and uploading the same to the server.
7. The application is designed with bi-lingual (Hindi and English) support. Contents should be in Unicode format.
8. On request of the Client and as the download functionality in Mobile device using 2G Sim, Desktop Sync tool has been developed for Downloading and Uploading the MIS and GIS Data.



Implemented Location: Local Facility

Resource Base:

Total number employees deployed	2
Name of software used in the project	Arc GIS Runtime SDK for Android 10.1.1, Google Android SDK 2.2

Particulars of Contract:

Project Value (INR)	Rs. 8,00,000.00
Date of award	30 th May 2014
Project duration	1 st Jun 2014 to 31 st Aug 2014
Remarks	Completed successfully in time.
Client contact Details	IT Head, GIS Division, M.P.Forest Department, Satpuda Bhawan, Bhopal. Mr. Indra Bisen, Ph: 91- 755 - 2674302

