NAVAYUGA

GIS Technologies

Introduction

Spatial Technologies (ST) are the emerging paradigm in the Information and Communication Technology (ICT) domain. The vision is that Spatial Technologies will get seamlessly integrated into conventional Information Technology solutions and services and the demarcation between these two distinct elements will disappear. The world is getting more graphically and visually oriented - needing the backbone of spatial technology and application solutions.

Technologies of data acquisition - satellite remote sensing, aerial remote sensing (from a variety of instruments and cameras) and ground-based surveys are becoming more and more sophisticated and automated -even providing spatial data in a regular manner. GIS Databases are becoming object - oriented and provide seamless integration of volumes of layers and datasets. The computerization of conventional maps - land records, survey maps, thematic maps etc are yet another major and essential requirement. Precision Positioning Systems - both from satellite based instruments and ground instruments are making it possible to associate location information to any dataset. The modeling and application opportunities are immense and cut-across applications, supporting governance, society, business environmental monitoring and many others.

Navayuga aims at serving the needs of the national and global markets through focused, innovative, efficient & quality products and services in all areas of spatial technology and applications. Navayuga brings horizontal and vertical integration of satellite/aerial Remote Sensing, Photogrammetry, Positioning applications, GIS databases and applications, GIS web-services and networking of GIS databases.

Navayuga has experience in seamless integration of spatial technology and conventional ICT and solutions - thus opening up new vistas and niche - areas of applications services. Navayuga has the best professionals in this technology and boasts of a top technical team (drawn from some premier Indian institutions and industries) - who bring with them more than 25 years of experience in spatial technology fields. The team has professional contacts with some of the best international companies and agencies and partners at national and international level to leverage business solutions and benefits.

The Navayuga team, with its vast experience and expertise, provides the company the strength to offer innovative, quality and effective solutions to all sectors of government, private enterprise, academia and non-governmental organisations.

Navayuga also has the best of computing facilities for remote sensing applications and data integration, photogrammetry, GPS applications, GIS development and software development.

Navayuga Group

Navayuga Group is a conglomerate organization that is built on strong foundations of quality, trust and dedicated professionalism. Navayuga Engineering Company Limited is the flagship company. The group has diversified into multi-disciplinary areas of heavy engineering, construction, marine structures, infrastructure, exports, shrimp farming and processing, quarrying of granites, mining of minerals and semi-precious stones, information technology solutions, medical transcription, software development and now has embarked on a focused initiative offering innovative solutions in the Spatial Technology sector.

Spatial Competencies

Capabilities includes innovative and quality spatial technology and application services with a focus on developing powerful and effective solutions that can leverage governance, society, business and academia.

Our strength is in systems design and implementation - where we understand user needs and develop a systems design to meet the requirements. The technology is a means of achieving the end and users are assured of an end-solution that will be operational, robust and quality certified for their operations. Our capabilities includes innovative and quality spatial technology and application services with a focus on developing powerful and effective solutions that can leverage governance, society, business and academia.

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“At Navayuga, our focus is on delivering enhanced value to our customers and partners. From the beginning we have strived for continuous improvement in our processes and practices. A great team and loads of enthusiasm & dedication have ensured that we have consistently surpassed client expectations.”

- C.V. Rao, Chairman, Navayuga Group

Innovative GIS for Industry Verticals

Navayuga has significant domain expertise related to different segment requirements and can also bring in other national and international expertise, as required, to serve any unique requirement. We link and partner with many agencies and thus can bring in cross-cutting expertise to serve industry verticals like Enterprise GIS, Engineering GIS, Natural Resources Management, Infrastructure Development and GPS Technology/ Wireless.

Our motto - Quality and Innovation

The Navayuga team is very conscious and sensitive to the requirements of quality and its importance for spatial technology solutions and services. With our rich past experience of implementing national and major GIS projects by the team of Navayuga, we assure consistent Quality Control (QC) and continuous quality improvement processes. Innovation is yet another strength of Navayuga. We strive to innovate and bring newer and newer solutions that can make a difference.

GIS Solutions and Services

Our experts have vast experience in developing, launching or implementing a Geographic Information System (GIS) for organizations and solutions that are applications-oriented. Our team can work on any GIS platform and provide final solutions. A strategic approach in meeting user needs can even break-down tasks to just GIS database creation, GIS standards implementation, maintaining and updating GIS archives, implementing total systems design for organizational GIS and even building applications on GIS databases as per user requirements.

Taking a holistic approach of spatial data creation, GIS ingest, GIS database organization and maintenance and GIS applications development can relieve users and organization of the "technology assimilation" curve and enable them to benefit from spatial technology solutions more effectively.

We can establish and maintain GIS portals for organizations with a back-end spatial data repository and middle-layer applications on a front-end web-GIS. We also offers GIS consulting and can even prepare feasibility reports, project assessment reports and conduct market and research surveys in this field.

Our expertise can benefit organizations to implement GIS standards that comply with their own needs and integrated into national (NNRMS Standards, NRIS Standards, NSDE Standards etc.) and international standards (ISO, OGC-GML) and others.

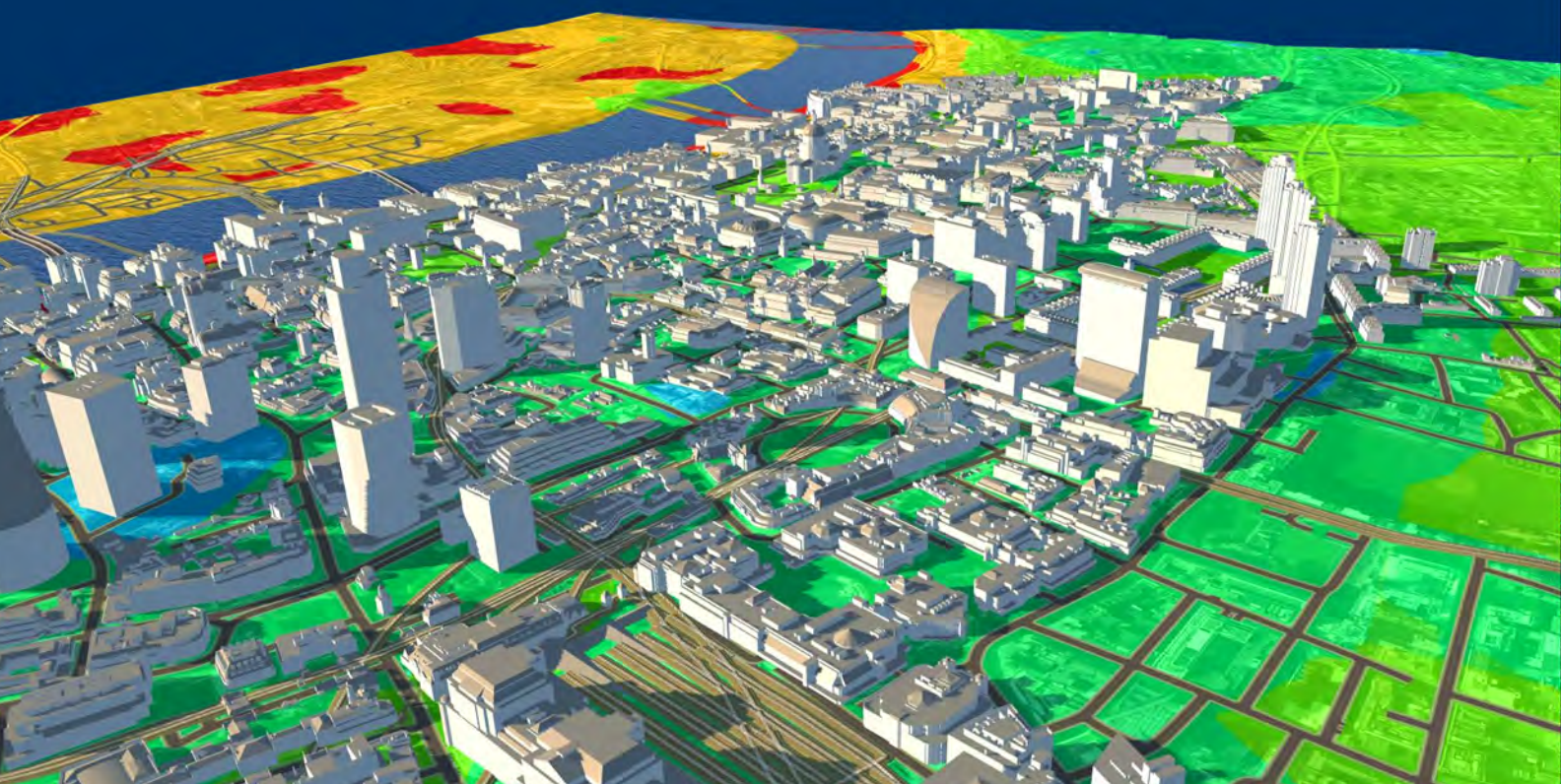
Remote Sensing Solutions

Our team can process, analyse and convert aerial and satellite images to generate thematic maps, Digital Elevation Model, cartographic quality maps, predictions and estimation (of crop production, forest stock and so on) and generate perspectives of systematic change. Data fusion technologies are used to create new perspectives of images and create systematic image sets for applications - agriculture, landcover and landuse mapping, urban landuse, forest mapping, terrain modeling, disaster management support (floods, landslides etc), groundwater targeting, coastal landuse mapping, environmental assessment, cartographic mapping and many other areas. Our experts can "simulate" spatial information perspectives from images of IRS, Landsat, SPOT, Envisat, IKONOS, OrbView, QuickBird, aerial images, aerial survey data and "reduce" these images into meaningful information for users.

Photogrammetry Solutions

We have an experienced Photogrammetry team equipped with the latest in digital soft copy Photogrammetry systems. We offer leading edge, professional mapping services which are time and cost effective with 100% client satisfaction. We offer's comprehensive services in the field of Digital Photogrammetry where we are capable of handling Stereo aerial including airborne-lidar and satellite images (in digital or "scanned" formats) to generate:

- High precision large and small scale mapping
- Generation of Digital Elevation Models
- Ortho-rectified image mapping using high precision orthorectification techniques
- Infrastructure mapping
- 3-D modeling
- Variety of value-added products



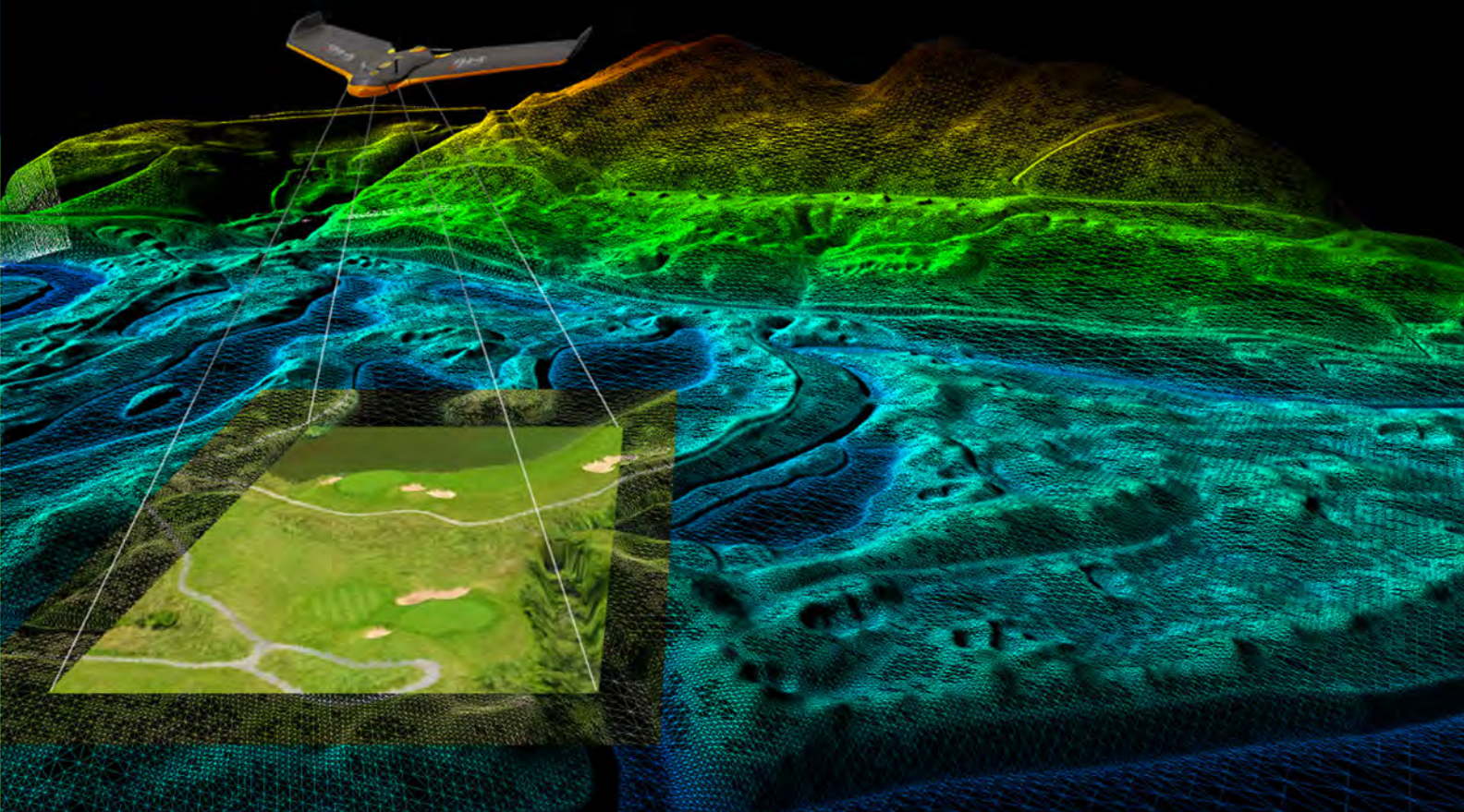
Surveying and Mapping Services

Conventional ground surveying using Total Station equipment, GPS, electronic surveying equipment and other survey equipment for preparing survey maps is a strength at Navayuga. Integrated with the parent Navayuga Engineering Company (who have more than 20 years of engineering and surveying experience), the Navayuga surveying team has vast experience in surveying and mapping large areas. When integrated with advanced GIS technology, new tools - specifically created for surveyors and engineers, can allow direct ingest of survey data into GIS and developing Survey Information Systems.

We have knowledge of innovative surveying using Ground Profiling Radar (GPR) for underground asset mapping and also in processing data from Laser Terrain Mapping (ALTM) instruments.

Database Services

The core of any ICT or spatial technology solutions is the database. Generating databases forms the important element of spatial technology services. Whatever the need of projects - scanning paper drawings, maps, aerial photos or satellite images and creation of document archives; vectorizing solutions on the scanned products to organise GIS databases; tabular database creation from text/ tables on various database engines; documentation solutions - Navayuga offers quality and assured services that can need any project requirement. We can even work with users to ingest these database services into “seamless” GIS databases that can form the back-bone of GIS solutions of any organization. In all these activities, We adopt stringent quality checks and standards.



Positioning and Navigation Applications

Precise Position information are available from satellite positioning systems - like GPS, GLONASS and the future Galileo and India's SBAS system. The position information can add high-value to spatial databases and images and thus Navayuga integrates these into spatial technology solutions. Position information is an essential element for image and GIS applications. Dynamic position information, integrated to GIS databases, offers enormous possibilities for solutions in aviation sector, transportation, ship navigation, geo-dynamics etc. Navayuga can offer solutions in these areas.

Web GIS and Wireless Systems

The future of spatial technology is in its integration with web and wireless systems that can offer GIS services on a variety of devices - internet, desktop, hand-held, mobile etc. GIS on small hand-held terminals (like Simputers and PDAs) will be the order of tomorrow. Location Based Services (LBS) through mobile and internet on a revenue model can be developed. Organizations and agencies wanting to offer Web-based spatial solutions on internets or closed intranets can be well served by the team at Navayuga.

Strategic Consulting

Navayuga can undertake Strategic Consulting services in GIS to organizations that require system-efficiency and cost-effective GIS solutions - especially by understanding the client needs and focusing on how their core business needs to provide customized spatial technology and GIS solutions. Navayuga is well equipped to provide Strategic and Technical Consultancy to various industry verticals - aiming at strategic alignment of spatial technologies into agency objectives and prioritise for providing cutting edge geospatial solutions.

Navayuga can provide unbiased, platform independent and cost effective consulting services in all leading GIS systems, technologies, business domains and handle geospatial data in any format that is customized to specific customer requirements. Our special focus can be on:

- Formulating spatial strategies and preparing detailed project reports
- Planning and feasibility studies for GIS
- Customer needs requirement, study and analysis
- GIS cost benefit analysis and Market Research and Analysis
- GIS Database systems and Warehousing
- Spatial Data Infrastructure establishment
- Integrated GIS applications design
- Migration and implementation strategies for GIS

System Integration in GIS

Navayuga can undertake customized or special systems integration and training activities for organizations on the different horizontal and verticals of GIS.

Navayuga's system integration and software testing processes deal with systems design, systems implementation, integration testing and operationalisation, quality control checking etc. Our systems integration expertise helps you implement and integrate GIS technologies to achieve your specific business objectives. Through a powerful blend of management and technical expertise combined with deep industry knowledge, we collaborate with your business and technology leadership teams to implement the systems and applications that deliver results to your business. With our technology capability, we can help build and establish challenging spatial information systems.

GIS Software solutions development and integrated IT solutions

Navayuga will provide best practices for GIS solutions development and can provide a businesscritical software development platform that can successfully incorporate quality design and proven management techniques into client software projects. Navayuga can provide seamless software for integrated GIS and IT solutions - that can be niche for conventional IT or specialized GIS requirements. Navayuga can undertake, build and deploy spatial technology and applications software, design and architecture GIS systems and systematically take up GIS applications testing and quality assurance.

Navayuga can also develop customized GIS applications utilities that can enhance productivity and client operational needs.

GIS Education and Training

Customised instructor-led or off-line GIS training is essential for application programmers and critical technical staff, for those who have specific technical or application questions, and for those who are new to GIS or do not have the full support of skilled staff on the job. Navayuga is geared to take up such basic and specialized training.

Applications Development

Navayuga can undertake applications development on GIS platforms. Some of the GIS solutions and services we can support include the following:

- Natural resources management - inventory and management of agriculture crops, land cover and land use, forestry resources, water resources etc. Establishing a natural resources information system, around a GIS core, will be key for many government needs
- Disaster and emergency response - where applications of GIS for response and rehab/ relief works is the core
- Land records with a Land Information System (LIS) - where land records computerization with the cadastral maps can provide innovative land management solutions and public enterprise
- Urban management, property and taxation applications as part of an urban GIS where multi-scale GIS solutions for planning and administration of urban areas and optimizing tax-collection can be enabled
- Insurance applications to support the needs of insurance agencies for crop and property insurance management
- Port GIS to support planning and management of Ports - both already operational and new ones being taken up
- Aviation GIS to support Airports Asset management and air-traffic control requirements
- Traffic and Road management - mainly as road infrastructure planning and management
- GIS in energy and power sector
- Telecom GIS to support fixed and mobile telecom services (including Location Based Services)
- Transport GIS for optimizing fleet operations and transportation networks
- Police GIS to support police and security requirements
- Defense applications and services (handles in a separate division)
- Engineering GIS to support construction, architectural and landscaping applications
- Enterprise GIS to support retailing requirements, business geographics, real estate requirements
- Unique solutions for energy sector applications
- Host of applications front-ending spatial technologies on conventional IT back-ends

Key Projects

- **Delhi State Spatial Data Infrastructure (DSSDI):** One of the largest **"GIS Project"** in terms of Technology, Size & Order Value (valued at USD 30 Million), 3D Texturing & Visualization, Photogrammetry mapping, Over & Under Ground Utility survey.
- **Federal Electricity and Water Authority (FEWA):** Field Survey of over ground and underground electrical and water utilities. The project covers emirates of Umm Al Quwain, Ras Al Khaimah, Fujairah and Dhaid Area (Central region).
- **Abu Dhabi SDD GIS:** Search Plots, Address and Building Data, Quick Identification of Feature, Download Data and Print Data.
- **RAK & Ajman:** Aerial flying using latest new generation large format digital camera. Cadastral Demarcation Surveys using GPS, Asset Mapping and Inventory, Base GPS for Kinematic GPS processing for LIDAR, Enterprise GIS.
- **Public Authority for Electricity & Water (PAEW) - Water Utility OMAN:** Underground asset detection, mapping and data collection.
- **RAPDRP program implementation** covering Asset Management and Consumer Indexing, GIS Mapping of the entire distribution network, New Connection, Disconnection and Dismantling, Meter Data Acquisition, Metering, Billing and Collection, Energy Audit, Customer Care for **key states in India**.
- **eMunicpality implementation for Itanagar Municipality**.
- **Vadodara and Ahmedabad Municipal Corporation:** Base Map Creation, Survey, Property Tagging, Supply, Implementation & Post Implementation Support of Geographical Information System Solution.
- Mapping of 3 places (Belgaum, Gulbarga, Hubali-Dharwad) by photogrammetry for **Urban Mapping Cell, Govt. of Karnataka**.
- Consultancy services for providing 3D base maps services for **City of Noida:** 3D mapping, DEM generation and Ortho-rectification, Organizing 3D GIS Database and Terrestrial Laser Scanning (TLS).
- **Mobile Inspection Management System (MIMS):** Web based inspection, auditing and complaints management application (Bilingual English/ Arabic) for **Abu Dhabi Municipality**.
- **Al-Ain Survey:** Underground LV cable survey using the state-of-the-art Cable Trace equipment.
- **Annual Survey Services for RAK:** To carryout GPS/ Total station based plot boundary demarcation.
- GRP Survey for underground detection of storm water and irrigation networks for **Abu Dhabi Municipality**.

Highlights

- Over **35,000 sq. km** of **Aerial Survey**
- Over **58,000 km** of **GPR Survey** for **Under Ground Utility mapping**
- **3D Mapping** using **Photogrammetry** technique for over **55,000 sq. km**
- Door to Door **Property Survey** of over **20 million Properties**
- **Cadastral Mapping** of **6,00,000** Urban Cadastral Maps Digitized
- **High Resolution Satellite Mapping** of over **10,000 sq. km** using 0.6m, 1m, 2.5m, 5.8m
- **GPS Control Data Survey** of over **1,00,000 points**

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