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ESRI India
GIS and Mapping Solutions

ArcIndia News

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Event Coverage

10TH ESRI INDIA USER CONFERENCE 2009 – "ROADMAP TO GEOGRAPHY IN ACTION"

India the surge ahead
GIS Stimulus

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From the President's Desk

Dear Friends,

As all of you are by now aware, I took over the reigns of NIIT GIS Limited (ESRI India) as its President and Chief Operating Officer (COO) in April, 2009 (after I joined ESRI India as its COO in August, 2008) from Rajesh Mathur. Today, ESRI India is one big GIS enterprise that is prime in India and is also very active in GIS solutions offerings in Asia Pacific, Middle East, Americas and Japan and other places. Thanks to the solid effort of Rajesh Mathur – who is a pillar for ESRI India and is a great veteran in the GIS business. He has grown this enterprise from early beginnings to a very successful Indian GIS enterprise now. For me it is a privilege to have known Rajesh for many years now and also of having closely worked with him in the last few months and I am happy to be taking over the lead of ESRI India from him. Be always available, Rajesh - we will need you!!!

As I very quickly settled down in my new role, many thoughts have been coming to my mind and I intend to share some of this with all of you in brief:

- India is on a great growth-path and it is time to make this path – as geographic as possible. Within ESRI India we have done a thorough study of how GIS can get a stimulus from some of the important national developmental programmes of the new Government. GIS solutions is now all about "design" (as Jack Dangermond emphasises) – Designing the Future, Designing Human behaviour, Designing Nature – all of which will require an intricate understanding of geographical processes and relationships and where GIS will become more and more embedded and assimilative. We propose "designing" GIS in as many of these national endeavours and, in our own way, help contributing to efficiency and success of these programmes to be more productive, help make better decisions, and be more efficient in reaching the benefits to the grass-root and the needy. We identify 14 such GIS stimulus to national programmes and we plan to launch a major drive towards these with the Government. Many of you will be a part of these endeavours and we look forward to work as a INDIA GIS TEAM. Read on in this issue!!!

- ArcGIS 9.3.1 is out in the market and ArcGIS 9.4 is not far away. ArcGIS 9.3.1 has high-performance dynamic map services; easier procedures for creating map caches; better sharing of geographic information via layer packages and many other features. ArcGIS 9.4 will be superior with a strong model-builder, python interface, great improvements in Spatial Analyst/3D/network, enhanced fuzzy logic and 3D processing, raster interface and processing etc. Very exciting times for GIS users and for solution-building – imagination will be the limit!!!

- Images and maps processing is becoming a single solution – just as in ArcGISServer with image processing and serving capability. In addition, ENVI technology is integrated with ArcGIS for image processing and geospatial workflows - providing a full spectrum of remote sensing data types to ArcGIS Desktop and ArcGIS Server users, including electro optical, multi-spectral and, SAR and Lidar. It makes a lot of meaning to combine images and maps in and avail it for any combined or individual processing – with the best of compression and serving efficiency. A great time ahead for both Image and Map Portals!!!

- SDI is more relevant than ever before – more on services-oriented architecture. The Indian and other SDI vision involves the creation of a common and shared library of geo-spatial services - created from multiple holdings of geographic data that are managed and maintained by different generators. These Geo-spatial services are then used by various applications across organizations and for citizen access. Hopefully, the Indian NSDI is near reality!!!

- Enterprise GIS solutions are the order of the day. Many of you are now on way establishing GIS solutions in your enterprise – be it power, governance, urban/municipal, retail, telecom, defence/security, land management, rural development, farmers and so on. What is becoming vivid is that GIS is getting assimilated into work-flows and processes of organisations and in many cases driving the enterprise solutions. A case for strong focus on the enterprise solutions on ESRI products!!!

While these challenging things happen in the GIS scene, I also want to bring some very special and unusual aspects of ESRI India to all of you – traits that are built on high value systems (we strive to bring the same value systems in our work with you and for all of you):

- ESRI India, I think, is one of the very few Indian GIS companies (maybe the only!!!) that has successfully had a leadership succession – not many have such a succession planned and executed like done by NIIT-GIS. Succession of leadership is a challenge in most cases and I am happy that the succession has gone on smoothly and completely – more a great credit to the founding principles of ESRI and NIIT – the 2 great international ventures that make ESRI India complete. Also a great credit to Rajesh and his acumen at situational awareness. So, dear ESRI users, good enterprises bring good GIS to you and good GIS means value to all of your activities and enterprise.

- ESRI India now has a FRESH senior management team – all its top senior persons are fresh and new to their role – though many have been with the organisations for quite some time and have risen up in rank and responsibility. It is only an organisation of great vision and acumen that rises its own people up and gives a perfect chance to be stable and strong. From a vertical point of now, we have very strong focussed GIS Solutions for the power sector, land records, urban and municipal, defence and security, natural resource management, environment and global change and SDI development. Our whole team feels that the onus is on each of the team to ensure that the ESRI technology is best utilised and its capabilities are best available to society – thus realising that going that extra-mile is very important to bring value and success to all of you.

In summary, great GIS technology, great GIS applications, large demand and need for GIS, a great and experienced GIS team, high commitment to bring value and success in GIS solutions and always believing that YOU, our GIS user, is always the final supreme for us. To end, I would like to commit myself to all of you in the GIS community. ESRI India has adopted a motto for itself – that is to provide "much more for much less" which essentially means position ArcGIS products and solutions to all our customers as a most cost-effective requirement and bring in an extreme efficiency in process of GIS delivery, thinking ahead, acting ethically and delivering what you all want in a schedule that is expected by you - all of which, we believe, will make you very satisfied and comforted of getting more value for your investment. Our future vision is founded on this principle and we are going to work on this and we believe we shall be successful.

Mukund Rao
President & CEO

Mobile GIS for Field Mapping

ArcPad is designed for GIS professionals who require GIS capabilities in the field. It provides field-based personnel with the ability to capture, edit, analyze, and display geographic information easily and efficiently.

With ArcPad, one can

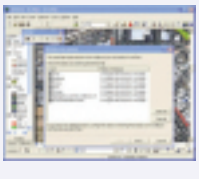
- Perform reliable, accurate, and validated field data collection.
- Integrate GPS, rangefinders, and digital cameras into GIS data collection.
- Share enterprise data with field-workers for updating and decision making.
- Improve the productivity of GIS data collection.
- Improve the accuracy of the GIS database and make it more up to date.

Key Features

Designed to be easy to use, ArcPad provides an extensive set of tools for mobile GIS applications and tasks.

GIS Data Collection—Create, edit, analyze, and display GIS data in the form of industry-standard vector and raster image files. ArcPad can also act as a client to ArcIMS, ESRI's Internet mapping software, or to the Geography Network.

ArcGIS Server ArcPad Extension—Publish ArcPad projects to ArcGIS Server using the ArcGIS Server ArcPad extension. Any device that can connect to the Internet (by cradle, USB, WIFI, or phone connection) can synchronize ArcPad edits directly with the enterprise geodatabase via ArcGIS Server Advanced Enterprise edition.



Integrate External Hardware—ArcPad supports field devices, such as GPS receivers, rangefinders, and integrated digital cameras with GIS data collection. Input from these devices is stored within the GIS.

ArcPad Data Manager Extension for ArcGIS Desktop—A mobile component of ArcGIS, ArcPad integrates with desktop GIS technologies to allow field edits to be incorporated into a geodatabase through disconnected editing. It replaces the ArcPad Tools for ArcGIS Desktop that came with previous versions of ArcPad.

Symbology and Style Sheets—ArcPad enables high-quality mapping on mobile devices through supporting ArcGIS symbology and style sheets.

Language Support—ArcPad accommodates localized languages. The ArcPad user interface is available in a number of languages, making it easier for mobile field workers whose native language is not English.

Customization—Create custom solutions for mobile GIS applications and tasks with ArcPad Studio.

StreetMap Extension—The StreetMap extension is based on ESRI StreetMap Premium data derived from the Tele Atlas dataset and now includes data for Europe in addition to North America. This extension is part of core ArcPad functionality and is included at no extra cost. It supports the Smart Data Compression (SDC) format and enables display, address geocoding, reverse geocoding, and routing capabilities.

What's New in ArcPad 8

ArcPad 8 is now available and includes new capabilities, performance improvements and quality enhancements. ArcPad Studio, the development framework to customize ArcPad, is now included with every ArcPad 8 license. With the release of version 8, ArcPad became a maintenance-based product. Customers may subscribe to annual maintenance to get ArcPad updates and technical support.

Highlights of ArcPad 8 include:

New User Interface

ArcPad 8 has a new look and feel with modern icons and toolbars that use less screen real estate than in previous versions. Toolbars can be docked, minimized and maximized by the user, and a new desktop tool called the ArcPad Toolbar Manager can be used to either modify the out-of-the-box toolbars or to create your own.

Synchronize Edits with the New ArcGIS Server ArcPad Extension

The new ArcGIS Server ArcPad Extension allows users to publish an ArcPad project to ArcGIS Server. Any device that can connect to the Internet (by cradle, USB, WIFI, or phone connection) can synchronize ArcPad edits directly with the enterprise geodatabase via ArcGIS Server.

Improved GPS User Interface

The GPS position dialog has been replaced by the new GPS status bar, which is a translucent toolbar that appears at the bottom of the map screen. It shows much of the same detail from the previous position dialog, but now uses color visual cues to indicate the quality of the GPS fix.

Enhanced ArcPad Data Manager Extension

The ArcPad Data Manager extension gives users more options when preparing data for ArcPad. Users can configure an ArcPad project for repeated use with geoprocessing tools, or author an ArcPad project for publication to ArcGIS Server for subsequent use in ArcPad.

Improved StreetMap Capabilities

The StreetMap extension included with ArcPad 8 now provides an easier method to find addresses and locations using the new lookup index. The extension is based on ESRI StreetMap Premium data derived from the Tele Atlas dataset and now includes data for Europe in addition to North America. The extension is included at no extra cost and supports the Smart Data Compression (SDC) format and enables display, address geocoding, reverse geocoding, and routing capabilities.

For more details, please visit http://www.esri.com/software/arcgis/ arcpad/index.html Ndex.html

GIS for Everyone - ArcGIS Explorer

ArcGIS Explorer is a free, downloadable GIS viewer that gives you an easy way to explore, visualize, and share GIS information. ArcGIS Explorer adds value to any GIS because it helps you deliver your authoritative data to a broad audience.

With ArcGIS Explorer, you can

- Access ready-to-use ArcGIS Online basemaps and layers.
- Fuse your local data with map services to create custom maps.
- Add photos, reports, videos, and other information to your maps.
- Perform spatial analysis (e.g.,visibility, modeling, proximity search).

Combine local data with Web services to create custom maps.

What's expected in ArcGIS Explorer 900W

- New User Experience—Better organization and management of tools and content, intuitive and easy-to-use ribbon interface.
- Integrated 2D and 3D Display—Integrated 2D/3D display, allowing users to choose their display mode.
- Presentation Tools—Help you create compelling interactive presentations that include your own maps and data.
- Easy to Configure and Customize—New tools provide an easy way to tailor applications to a specific audience or to specific needs.
- Do not require programming
- Multiple configurations can be authored and managed centrally
- Software development kit (SDK) lets developers build custom tools and add-ins to extend ArcGIS Explorer's capabilities
- Bing Maps for Enterprise—Continually updated basemaps and layers from ArcGIS Online.
- Includes Bing Maps imagery, streets, and hybrid layers.
- Available as a subscription-based service to standalone ArcGIS Explorer users. However, if you are an ArcGIS Desktop (ArcInfo, ArcEditor, ArcView) user, you can use the same Bing Maps content for free in ArcGIS Explorer that you use in ArcGIS Desktop.
- Internationalization—Support for multiple languages in both the ArcGIS Explorer user interface and in the online Help.
- ArcGIS Online Sharing—Search for, discover, and use additional content.
- Improved Data Support—Includes:
- Full support for the new layer packages that can be created using ArcGIS Desktop 9.3.1. Layer packages enable ArcGIS Explorer users to leverage ArcGIS Desktop cartography.
- Improved support for KML/KMZ files, including support for regionated KML.

ArcGIS Explorer 900 is expected to be publicly available after the release of ArcGIS 9.3.1 in Q2 2009.

For more details, please visit : http://www.esri.com/software/arcgis/explorer/i

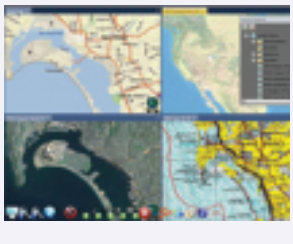
ArcGIS API for Microsoft Silverlight

Building Cross browser Cross platform Rich Internet Applications

ArcGIS API for Microsoft Silverlight

The ArcGIS API for Microsoft Silverlight is a powerful API for building cross-browser and cross-platform rich Internet applications (RIAs) on top of ArcGIS Server and Microsoft Virtual Earth™ services.. ArcGIS API for Microsoft Silverlight allows developers to use any .NET framework supported language (e.g., C#, Visual Basic) to add GIS capabilities and consume services from ArcGIS Server and Bing Maps for Enterprise in a Silverlight application. The API takes full advantage of GIS services such as mapping, geocoding, geometry, image, and geoprocessing capabilities of ArcGIS Server.

The API is built on the Microsoft Silverlight/WPF platform which is integrated with Visual Studio 2008 and Visual Web Developer Express 2008. The Microsoft Silverlight platform includes a lightweight version of the .NET Framework CLR (CoreCLR) and the Silverlight runtime - all hosted via a browser plug-in.



With ArcGIS API for Microsoft Silverlight, you can

- Display an interactive map of your own data.
- Execute a GIS model on the server and display the results.
- Display your data on an ArcGIS Online basemap.
- Search for features or attributes in your GIS data and display the results.
- Locate addresses and display the results.
- Add toolbars to draw polygons and points, zoom in and out, or pan on your map.

The ArcGIS API for Microsoft Silverlight™/WPF™ Release Candidate is now available.

To use the API you simply download the ArcGIS API for Microsoft Silverlight/WPF libraries and start creating your Silverlight or WPF applications using Visual Studio or Visual Web Developer.

For More details, please visit http://resources.esri.com /arcgisserver/ apis/silverlight/

ArcFM Solutions

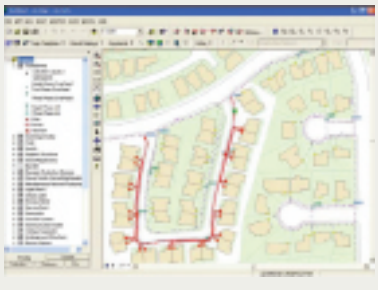
When utilities face tighter information technology (IT) budgets, reduced in-house development staff, and the need to quickly deliver business benefits through applications, they can significantly benefit from a more cost effective use of distribution assets for maintenance and growth. ArcFM provides a complete, out-of-the-box solution for facilities management designed to meet the needs of the utility business.

Telvent's ArcFM, a powerful extension of ESRI's ArcGIS platform, is a complete enterprise utility solution for editing, modeling, maintenance, and management of facility and land base informationfor electric, gas, and water/wastewater utilities.

ArcFM takes advantage of an industry-standard architecture and programming environments, an easy to-use interface, and powerful cartographic tools, giving utilities an optimized solution for the entire organization.

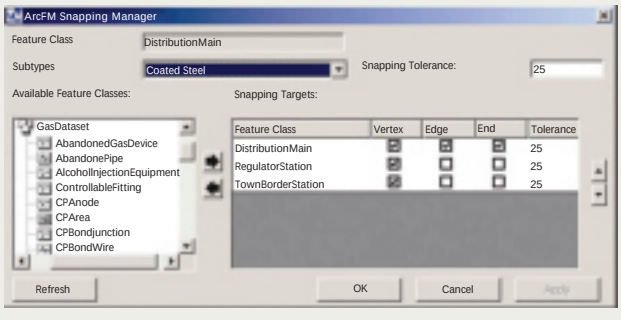
The ArcFM Solution allows utility businesses to make use of a single integrated environment to manage and map multiple assets, leveraging all the power of ArcGIS's object-oriented system.

ArcFM fits into the overall information technology vision of modern utilities through the use of open databases, industry-standard programming environments and COM architecture. Its unified strategic platform makes it configurable and easily aligned to multiple processes; its scalable architecture, targeting the full range of utility business needs, can be used for a single departmental installation or as a multi departmental enterprise configuration for creating, managing, and disseminating utility information.



ArcFM consists of a family of models and a set of sophisticated tools that provide a comprehensive enterprise solution for energy and water/wastewater utilities. ArcFM allows maintenance and viewing of data, using company wide business rules, and includes applications to configure thedata models and tools to work together.

- Enterprise Models – ArcFM provides a comprehensive utility object model which clearly defines the feature classes and relationships required to model the network and infrastructure of electric, gas, and water/ wastewater utilities.
- Enterprise Implementation – ArcFM provides a collection of tools to assist the utility in deploying the object model quickly and easily to all users. Tools for defining and storing map symbology, page templates, and system favorites are also included.
- Geodatabase Extensions – ArcFM provides tools necessary to successfully implement ESRI's Geodatabase for utilities including persistent snapping, business rules for feature classes and individual fields and data validation.
- Map Production – ArcFM provides the ability to quickly define and recall map sheet collections for map book production. Plots can be sent immediately or scheduled for a specific date and time.



- Composite Favorites – ArcFM provides tools to allow the user to easily place and manipulate composite favorites such as switchgear, substations, or regulator stations.
- Productivity Tools – ArcFM provides a full suite of editing tools from automated template layouts to attribute inheritance, to creation of user favorites.
- Utility Specific Tracing – ArcFM enhances the standard tracing tools to automate utility operations such as identifying cathodic protection zones, performing per phase electric tracing, and locating protective devices, pressure systems, and valves to be isolated.
- Feeder Management – ArcFM allows users to easily manage complex feeder systems. Users may generate a circuit map, update feeders based on new installations and modifications, select all features or tie devices associated with a specific feeder, and show feeder identity graphically in a map display.
- Abandonment – ArcFM provides tools to support pipe abandonment including abandon, remove, or convert to conduit. These tools will work for gas pipe, water pipe, as well as electric duct bank and conduit features.
- QA/QC – ArcFM provides an intuitive interface to validate features based on geodatabase rules and will identify invalid features. Users can then generate a report and correct the errors.
- Session Manager – ArcFM provides the ability to establish and enforce specific workflows by providing tools to set permissions, define user roles, create subtasks, and execute a predefined approval process.

Flexible Web Environment for ArcFM Solution

Today's utility information technology (IT) environment requires solutions that can support multi-disciplinary requests and be available in distributed locations. Telvent's ArcFM™ Server provides the key components for addressing these IT requirements for electric, gas, and water/wastewater utilities.

Complements ArcFM Solution, Supplements ArcGIS Server

ArcFM Server allows spatial enablement of ArcFM Solution, to provide an enterprise utility GIS. ArcFM Server consists of four components:

ArcFM Viewer for ArcGIS Server - an out-of-the-box web viewing application for viewing and analyzing utility GIS data in a web environment

Out-of-the-box ArcFM Server tasks and tools - including

tracing, bookmarks, and ArcFM identity tools, integrate with ArcGIS Server's Web ADF (Manager); they are added selectively, allowing a GIS Administrator to rapidly build utility-specific web applications without writing any code

ArcFM Server developer kit - a rich set of development tools that allows a developer to extend the viewing functionality and access ArcFM's framework of editing and business rule enforcement objects, including ArcFM Properties, ArcFM AutoUpdaters, ArcFM Model Names, and ArcFM GeoObjects

ArcFM Web Services - key components to supporting a service-oriented architecture (SOA) within business operations

More Data Available to More People

ArcFM Server web services enable GIS information to be accessed across multiple departments within an organization by both traditional GIS clients and non-traditional clients in a variety of environments, including: web browsers, PDAs, smart phones and 'thick-clients' such as ArcMap or ArcEngine – all with one license

ArcFM Server Editions

The two editions of ArcFM Server (Standard and Advanced) correlate with ESRI's ArcGIS Server editions and are defined by their functionality:

Standard - provides utilities the ability to view and query ArcFM information from a centralized server environment. This edition features an out-of-the-box viewing application, out-of-the-box task and tools, and a software developer kit for developing custom web applications.

Advanced - ArcFM Server Advanced Edition provides utilities the ability to edit an ArcFM geodatabase from a centralized server environment. ArcFM Server Advanced Edition features a software developer kit (SDK) for creating web based applications that access the ArcFM editing framework and supports the ArcGIS Mobile functionality.

ArcFM Server Tasks

All tracing results are available in the Attribute Viewer or are displayed on the map, where the user can define a buffer to highlight results:

Electric Traces allows users to trace electric distribution systems – upstream or downstream – and optionally return protective devices.

Gas Traces allows the user to display connected natural gas features in the distribution system as well as trace pressure systems and cathodic protection systems and identify valves and squeeze-off points for the emergency isolation.

Water Traces offers a variety of water distribution tracing capabilities such as the ability to trace a pressure system, cathodic protection system and distribution system.

ArcFM Mobile - Scalable end-to-end Solution

Utility users need flexible, scalable solutions to support various needs when "going mobile" with GIS facility data. No matter what the field task is, ArcFM Mobile solutions give you everything you need, from viewing and querying facility information, tracing your network, making redline changes and markups, and editing features and attributes, to creating and as-builting work order designs.

ArcFM Mobile solutions contain the products and features to support this entire range of functionality, plus the ability to tailor the user experience to support any type of user skill set. Mobile deployment options within ArcFM Mobile solutions are listed in the table below.

Benefits

It is important to understand the objectives of ArcFM Mobile solutions and the advantages of these products over the competition. Our technology:

- Is easy to use
- Provides a Single Computing Environment for field and desktop
- Leverages component architecture (both ArcGIS and ArcFM Solution) for maintenance and training
- Leverages ArcGIS versioning on an enterprise geodatabase
- Provides a configurable interface to support a range of user skills
- Makes data synchronization fast and transparent to the end user
- Ensures flexibility to support various process flows

Objective	ArcFM Solution	ArcGIS
View	ArcFM Viewer	ArcView or ArcGIS Engine
Simple Graphics/ Redlining	ArcFM Viewer with Redliner	ArcView or ArcGIS Engine
Attribute Updating	ArcFM Viewer with Inspector	ArcGIS Engine & ArcGIS Geodatabase Update
Edit features in the field, supplement graphics and digital ink	ArcFM, Session Manager	ArcEditor
Design in the field, supplement with graphics and digital ink	Designer, Workflow Manager	ArcEditor

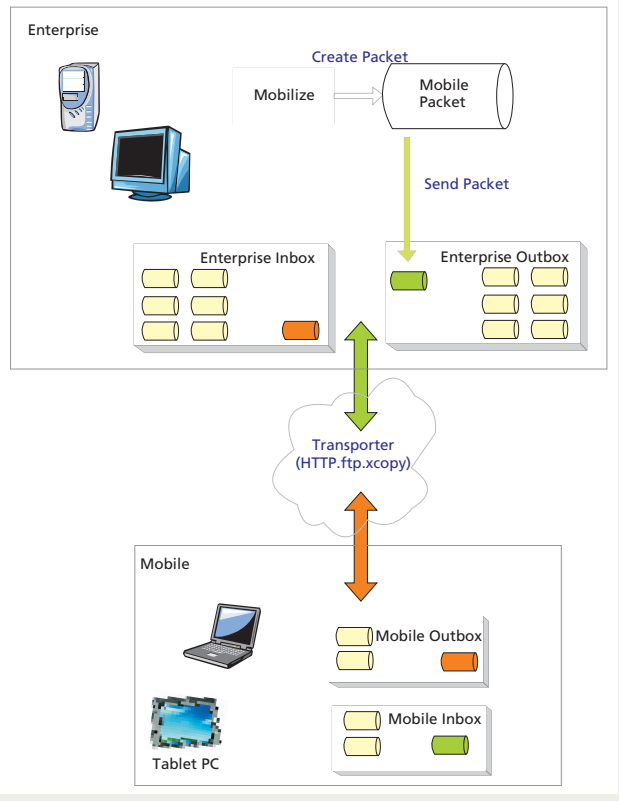
Geodatabase Replication

Geodatabase Replication provides Mobile users of ArcFM, Designer, ArcFM Viewer, Inspector or Redliner with access to the most recent data in the enterprise ArcSDE geodatabase. The tool allows users to synchronize geodatabases quickly by limiting the updates included in the replica to changes since the previous update.

Administrators have the ability to configure multiple replica processes to support a variety of business needs including enterprise ArcSDE to personal geodatabases and filters to limit the replica to a dataset, a spatial area, specific feature classes, or any combination thereof. Clients may subscribe to specific replicas, receiving updates at a specified interval or on request, allowing different clients to be given only the features or geography they require.

Mobile Components

- Backdrop Geodatabase is a personal geodatabase on the field units that contains a snapshot of in-place facilities made from an as-built version. It is kept current by regular extractions. Users can create subsets of the entire service territory to support specific administrator areas.
- Mobile Packet contains the information that needs to go to and from the field and includes the features, graphics, and other relevant data (e.g. compatible units).
- File Transport is the transport mechanism to send and receive via FTP or network file copy. The files are compressed and only contain delta changes.



- Data Synchronization is the means to synchronize the data contained in the packets with the enterprise and field geodatabases based on a configurable workflow.

ESRI India announces new organization structure

After twelve successful years at ESRI India; building and establishing ESRI as the leading technology in India; Mr. Rajesh C Mathur has been positioned as Vice Chairman, ESRI India, passing on his operational responsibilities to Dr. Mukund Rao. Mr. Mathur has also been given additional role in NIIT Technologies Ltd. as Head – Government Practice. In his new role in NTL he would focus on NTL business activities in the Government Sector and create synergies between NTL's technology solutions and GIS business. ESRI India has also restructured the leadership team that will continue to build on this foundation and drive the next phase of growth. Dr. Mukund Rao has been appointed the President and Chief Operating Officer, ESRI India. Dr. Rao with his impeccable credentials and over 28 years of vast experience mainly in Remote Sensing and GIS technology would provide ESRI India with fresh insights to take the organization to greater heights. Mr. Vatsal G Dave, who was earlier the Zonal Head for West, would be driving the domestic sales business and Mr. Prakash N Menon, earlier Zonal Head for South will Head the Marketing Division. Widening and adding depth to ESRI India's portfolio and to focus on specific segments, Power and Defence have been added as strategic verticals. Reflecting on his tenure and future, Mr. Mathur said "The industry has grown substantially over these years. There has been a major technology transformation that we have witnessed moving from desktop applications to enterprise applications. Not just has the awareness of GIS grown over the years but also the usage of GIS within India in these years has gone up considerably.

With the increased emphasis on infrastructure and the capacity building initiatives by the Government and Industry the usage of GIS will continue to grow. I am confident that under the new leadership team, organized into Sales and Marketing Group; Technical Services Group and specific Practices, ESRI India is well prepared to be a catalyst in this evolution." Commenting on the road ahead Dr. Rao said " We have adopted a motto for ourselves – to provide much more for much less, which essentially means to position ArcGIS products and solutions to our customers as a most cost effective solution for their requirements. This is possible by bringing in extreme efficiency in the process of delivery, thinking ahead, acting ethically and delivering what the customer wants in a schedule that is expected. We believe, this will make the customer very satisfied and make him come back to ESRI India again and again and again. That is the principle we are going to work on and we shall be successful."

10th ESRI India User Conference 2009 – "Roadmap to Geography in Action"

Recapitulating the key events at the 10th ESRI India User Conference of the like minded people of the GIS Community who had come to share their experiences; best practices, applications, difficulties and successes. The User Conference offered a wealth of information regarding software and technology from ESRI Inc (USA), ESRI India, exhibitors and business partners. Two days (28-29 April 2009) of user conference was inaugurated by lighting of lamp with august gathering of eminent personalities such as Dr. K. Kasturinrangan, Hon'ble Member of Parliament; Mr. Rajendra S Pawar, Chairman NIIT; Dave Byers, ESRI Inc. USA and Dr. Mukund Rao, President & CEO ESRI India.

The two day conference drew a diverse audience of several hundred attendees across the country with a fascinating mix of delegates and bureaucrats from the government agencies and the private sector one that is hopefully representative of the future role of GIS in their respective organisations across the nation. The Theme of the ESRI India User Conference 2009 was "Geography in Action", where GIS has a huge role to play The conference discussed the importance of geographical understanding of relationships and object-entities that bring more meaning and value to our decision-making process related to water, land, atmosphere, oceans and even planetary outreaches. A concept that means enormous work to standardize the specifications necessary for users to communicate with each other, transfer meaningful geospatial information and, in essence, form a common operating picture of the Earth environment.

The conference was opened by Dr. Mukund Rao, President & CEO, ESRI India who welcomed the august gathering of ESRI users and the eminent dignitaries. Sharing his views and user perspectives towards the need for a User Conference as a platform for all to meet, interact and discuss the new developments in ESRI technology. He also went down the memory lane expressing his gratitude to three eminent personalities who played an important role in his like – Mr. Rajendra S. Pawar, Dr. Jack Dangermond and Dr. K. Kasturirangan. He also praised Mr. Rajesh Mathur, former President, ESRI India who has been the pillar of ESRI India and shares the passion for GIS. Concluding his address he urged he user community to interact so that ESRI can rework and better services to the GIS community at large.

Followed by a message from Dr. Jack Dangermond, Founder & President, ESRI USA which was conveyed by Dave Byers. In his message Dr. Dangermond gave an insight to the vision about ESRI and working opportunities at ESRI India, he also talked about the quality of projects being implemented by ESRI India which are phenomenal and diverse in their application. He mentioned GIS has been very important in stabilizing for human action and will play a key role in development of a nation. ESRI has been committed to India and its government to address the various challenges in implementing the GIS technology and will support & facilitate ESRI India in all its activities. He also acknowledged the contributions made by Dr. K. Kasturirangan to GIS Community.

Delivering the Guest Address Dr. K. Kasturirangan, Hon'ble Member of Parliament and former Chairman ISRO, said that its time we look at the new trends in GIS technology for future and how the commendable work done by our Space agencies for decades can be beneficial to the GIS users and community

at large. He added Earth is undergoing change in environment and we should look at Geo-engineering which is the future. Today's GI agenda is to observe, collect information, modeling and support the information. He also said that we need to integrate these GI agenda within the word systems to observe, predict and finally reach out for effective management. He concluded by saying that "India provides a challenge and it is not whether we need GIS , but can we afford to ignore it".

Addressing the gathering Mr. Rajendra S. Pawar, Chairman, NIIT in his Keynote address focused on GIS for National Development special focus on Elections and how GIS can play an important role in effective leadership. He also emphasized the need for GIS computing and imagery capability for a parliamentarians and legislators to have fair elections in their constituency. Mr. Pawar said "An image is indeed a thousand words", by which he meant that GIS can help a politician with what is and how it should be. He also emphasized that the computing capability and imagery can actually communicate information in simple terms that can be projected geographically and explained in their manifesto.

The Plenary Session was kicked started by Lawrie Jordon, Director- Imaging ESRI, USA presenting his views on "GIS – A New paradigm" focusing on the need of imagery in various GIS applications. Mr. Richard Cooke, President ITT VIS in his presentation focused on the Road Map of Image processing Suite integrated within ArcGIS system. Accentuating on the data interoperability and standards and their need, Mark Reichardt, President & CEO, Open Geospatial Consortium Inc. USA discussed the ESRI contributions to OGC Standards and its benefit to various applications worldwide. Lastly Dr. Shailesh Nayak presented his views on "Enterprise GIS Solutions for Earth Sciences: A perspective for Indian User Community. He also highlighted the use of GIS systems in exploring ocean mineral resources and continental shelves.

The ESRI Technology exposition showcased the latest features of ArcGIS technology and the peep into future versions of ArcGIS 9.3.1. During the technology session Mr. Satish Sankaran the technology expert from ESRI gave an insight on how to use the ArcGIS technology to enhance the user experience along with satellite imagery and software tools for optimum utilization of available resources and data within an organization. The technology session also focused on the ArcGIS Image Server and its capability to cover up the imaging solutions along with the integration of ENVI Image Processing capabilities. The session also looked at the Geography in Action – Immense possibilities in the Indian environment with various application domains such as infrastructure, urban development, irrigation and agriculture, asset management, cadastral/ land application systems, defence intelligence, utilities, e-governance, health management and real time applications during disaster management.

ESRI India always believed in the vision of moving ahead the geospatial technology for the development of the mankind. Keeping this vision alive we had HP Nvidia as Strategic Partner and Accenture as GIS Utility Track Partner who participated along with ESRI India, Forest Survey of India, Digital Globe, Cadd Centre showcasing the cutting edge development in the geospatial domain. Stating the art of exhibition as a large single family of GIS users, exhibitors had an opportunity to display their hardware, software, datasets, data services, application products and GIS information to the user community. The user conference witnessed an attendance of 410 delegates from 70 + organizations.

Along with the plenary session User Conference also had the technical sessions on the technology, GIS applications and poster session. These technical sessions featured ESRI GIS technology being used by the varied communities in the Indian subcontinent focusing on the major GIS applications. 32 technical papers and 12 posters were presented during the conference along with the display of GIS technology at the exhibition. The most exciting was the GIS Utility Track focused on Power which was sponsored by Accenture and conducted by Miner & Miner.. The audience attendance at the track were mainly from government agencies and system integrators who are involved in the energy and power sector implementation sector. Mr. Bob Lyhus from Miner & Miner and Vatsal Dave, ESRI India gave a glimpse of Enterprise Utility Solutions focusing Power Sector.

The Best Paper and Poster Awards were honored to the GIS professionals using ESRI GIS technology. The first best paper award was given to Kolagotla Vijay, Gammon India Ltd., Mumbai for Geographical Information System And Its Application To Project ManagementIn Construction Industry; the second best paper - T.Hemalatha from , Amrita Vishwa Vidyapeetham, Coimbatore, Tamilnadu for Robust Watermarking Of Remote Sensing Images Without The Loss Of Spatial Information; the third best paper was shared by two presenters - S Subash, NeST Information Technologies (P) Ltd.,Cochin for SIGNETS-An ArcGIS Server Add-on and Dr.L.R.Yadav, NIC , MCIT, Lucknow for GIS Applications in Statistical System and Micro Level Planning Strengthening. The first Best Poster awards was given to ATKINS ; second – WWF, New Delhi and third - GSI

As always, the User Conference was a hotbed of new ideas with conversations about trends that are occurring in the GIS world. The Panel Discussion was conducted on second day on "Geography in Action – Relevance to India", the panelists were, Mrs. Vandana Sharma, DDG NIC; Mr. Y V N Krishnamurthy, Daye Byers, ESRI USA and Dr. Mukund Rao, who was the moderator of the discussion forum. The forum discussed the various aspects geographical domains such as Panchayti system, capacity building for various field information, availability of data based on standards, enabling GIS tools to share geographic information, interaction with stake holders for future development of software technology and solutions. The other hot topic of discussion was the giant killer application and most of them had their own perceptions for the various applications such as mashups, web based for easy interface and data sharing being the key aspect for futuristic development in GIS.

The conference concluded by the closing address by Mr. Arvind Thakur, CEO, NIIT Technologies Ltd. He discussed the need to look out for opportunities during the time of global recession and how GIS could be a beneficial factor in achieving these opportunities. Thus the conference concluded with the hope to meet back at the 11th ESRI India User Conference in January 2010.

As the new Indian government is sworn in, it has charted out a 100-day action plan to get the nation back on the growth path and address immediate priority areas. The bottom line of the new mandate is to have better governance through inclusive growth and equitable development to construct a secular and plural India. India has endeavored to bring economic and social change through development in various sectors. The effort has been both on upgrading the traditional skills to make them relevant and competitive and developing advanced capabilities in frontier areas. Technology has been an important driver of economic growth and development in the contemporary world.

GIS is critical to many aspects of the governance areas – it saves money, helps government administrators make better decisions and increases collaboration. Past evidence suggests that over the current and past downturns, GIS is a tool that is seen by management as progressive and important for running government. GIS started as a research technology in the 1970s, when academics ran applications on mainframes for geospatial science research. In the 1980s, a few government agencies pioneered the use of GIS in more practical applications such as urban development and forestry. Commercial GIS products running on workstations emerged in the early 1980s, which allowed systematic creation and sharing of geographic data for multiple applications outside the academia. In the 1990s, GIS moved into PCs and became more affordable. It also created the foundation for GIS professionals, which number in millions today. As Jack Dangermond, President of ESRI believes the fourth phase is just beginning, with the implementation of GIS in a server/web services environment. Simple web mapping became available in the late 1990s, and the first GIS server came on the scene a few years ago. "This allows the creation of geographical knowledge by a professional, which is put onto a server that serves millions of users," notes Dangermond. "The result of this is more open government."

The Surge Ahead

A continuing priority of the government has been to consolidate the ongoing flagship programmes for re-energising government and improving governance. The chartered version of the 100 days action plan of the new manifesto covers a wide variety of programmes and challenges for the next five year plan. The challenges identified by the new government are

- Internal security
- Economic growth in agriculture, manufacturing and services
- Consolidation of flagship programmes in employment, health, rural infrastructure, urban renewal, food security and skill development.
- Governance reform
- Creation and modernization of infrastructure
- Energy security and environment protection
- Prudent fiscal management
- Promotion of culture of enterprise and innovation
- Concerted action of the welfare of women, youth, children, other backward classes, SC/ST, minorities, the differently abled and the elderly along with the strengthened social protection.
- The above focus-sectors are an addendum to the existing Bharat Nirman programme which was one of the biggest infrastructure development programs in India's history.
- Rural housing scheme for below poverty line to one crore twenty lakh houses in the second phase
- Rural water supply programme to be completed by 2011 and handed over to be managed by panchayats in the next Plan
- The rural telecommunication target will be at 40 % rural teledensity in the next five year plans and expanding the broadband coverage to connect every panchayat to a broadband network in next 3 years.
- New targets for electrification, irrigation and road connectivity.

We Identify 14 major programmes that can benefit from GIS

The Action – 100 days plan is becoming the flagship programmes that will help the country to move ahead in the surge of inclusive development

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and endeavour to consolidate these programmes in the next five year plans.

Will the Government enable a GIS-stimulus in the country by embedding a GIS component in these 14 programmes?

Here is a snap view of the 14 'flagship schemes' action plan that GIS can support:

1. National Rural Employment Guarantee Scheme (NREGS) - an effective social protection and largest programme in the world for rural reconstruction. It is supposed to provide 100 days of work at minimum wages to all registered individuals in rural areas. There is an opportunity of improving land productivity and maximized benefit through convergence of NREGS with other integrated programmes ensures employment to rural sector.

   GIS can play a role of enterprising the NREGS programme by geo-tagging all rural works, beneficiary-tagging, administrative sectoring, financial geo-tagging, monitoring implementation and availing

NREGS
MIS on a GIS framework of a National GIS.
What is needed is an integrated GIS solution on a basic GIS frame and linked to NREGS attributes.

2. National Rural Health Mission (NRHM) - to upgrade the health infrastructure, appoint medical personnel and address key issues like infant /maternal mortality and immunization in every village. Expansion of Rashtriya Swasthya Bima Yojana as an insurance cover to all the families below the poverty line.

   A National Health-GIS can serve as a foundation of the NRHM. The Health GIS can not only serve the needs of NRHM from both health infra-management, immunization related geo-tagging and also on rural health insurance – apart from geo-enabling a NRHM-MIS based on a geo-framework of a foundation GIS. The Health GIS can also assimilate the needs of Integrated Child Development Services (ISDC). Queries to monitor the programme on administrative units and clinical data relationing can be the wide- range of applications.

3. Sarva Shiksha Abhiyan (SSA) - to provide access to children to elementary schools and to universlise access to secondary education and also expansion of in Higher education through institutions to meet the challenge of education in all measures. The Government is also considering re-structuring graduate level technical and collegiate education.

   A Bharat Gyan GIS can be the element of the education thrust that the Government attempts to provide. Educating school and collegiate/technical students with the Geography knowledge and preparing them for a geo-enabled society can be the foundation. Combination of mass and large-scale GIS education at schools thru Class-X GIS kits; specialized technical courses in engineering/arts/science graduate courses on GIS and also specialised Centres for GIS Research and Excellence can be some major activities to integrate GIS in education reforms.

4. Jawaharlal Nehru National Urban Renewal Mission (JNNURM) - to build and reshaping our city infrastructures, basic facilities, improve governance and upgrade transportation system. Coupled with Rajiv Awas Yojana for the slum dwellers and urban poor in lines of the Indira Awas Yojana for rural poor, the aim is to assign property rights to people living in slum areas, thus making slum free India in next few years.

   GIS must and is forming a founding part of JNNURM – we encourage that any JNNURM proposal must be based on GIS data and applications. Further, going on to expand the National Urban Information System, the core of "Each City Its GIS" must be the basis for any urban planning, management and development. Special focus on Urban Slums and Amenities and Alternatives can be the focus. The effort can be easily based on systematic mapping for each of the 5000+ urban areas, organizing a basic GIS infrastructure and developing GIS Applications that help it to develop its Master Plan and its Management Plan – which in turn can enable it to JNNURM support.

urge ahead
imulus

5. Safe Drinking Water Mission has been the ongoing scheme of the Bharat Nirman Programme with the aim to provide safe drinking water to the populations in the rural areas With hand pumps covering more than 6 lakh villages water sources are back to unsafe category as hand pumps fail, groundwater level falls and population increases. The need is for total water balancing and management at macro- to micro-level.

   A Water GIS is the order of the day to support this programme. Mapping all potential of ground water sources, the dark zones must be coupled with a water harvesting strategy – identifying sites and plans for water harvesting. This can be easily done by a GIS system of mapping as a national effort. Spatialising water sample quality data can help determine maps of water quality in a GIS. The existing locations of pumps and wells can be geo-tagged into the GIS. The geology, hydrology and morphometry can also be included in the GIS. What the national can have is a GIS based National level Water Resources Information System (WRIS) that can be the foundation for siting ground-water sources, siting water harvesting and actual harvesting to recharge aquifer systems and then planning for water balance at macro- to micro-level for optimum usage of water resources.

6. Agriculture sector is equally high on priority, especially when farmers need the fullest support for agriculture. The loan waiver scheme is like a write-off insurance cover to farmers to offset losses. Advising farmers to agriculture requires a integrated strategy to maximize agricultural output and to manage them thru distribution and marketing systems to leverage the farmer.

   GIS can be the foundation of a Agri-Services system that can integrate natural resources of soils, water, fertility etc with ownership/cadastral data and also to agri-facilities data that includes credit, seeds, fertilizers etc and have a farmer's knowledge engine that can advise farmers to maximize outputs, support the farm loan waiver scheme and also enable a GIS-enabled farming community in India.

7. Modernising Land Records – NRLMP programme – which is aimed at modernizing the archaic land records in India and to enable a systematic process of accurate survey/GIS based mapping of all properties and creating a Land Information System. While accuracy of measurements is of prime importance accuracy of representation must be as high as possible.

   GIS and spatial technology MUST form the foundation of NRLMP – based on the principle of "whole to part" and maintain precision and accuracy of multi-tagged data to enable a seamless Land Records GIS for large areas (district/states and then to national-level). While a pragmatic approach to "something to best thing: should drive the GIS to enable a LIS of what is available and progressively ingest accuracy and precision to an evolving LIS (what has not been done in 100 years cannot be done in 1 year but in 1 year we can have a FIRST LEVEL LIS and then evolve). Technologies of surveying, mapping, Geo-databases, Web-Mapping etc are most essential for this.

8. Disaster Management Support of NDMA – a national programme of being prepared for disasters and position a effective mechanism for managing disasters and create the resilience that is required to combat disasters. An assimilation of research for prediction/warning, disaster alerts/communication, damage assessment and rehabilitation/relief support is required.

   GIS technologies and Applications can be the foundation of this NDMA endeavor. Whether droughts, floods, earthquake, landslides, cyclones etc the spatial dimension is very prominent and maps play an important role. We propose a National GIS-based Disaster Portal that can provide access to an integrated system of disaster information – all linked from individual department GIS servers of maps, images etc into a National GIS frame. The GIS-Portal can serve images, maps on real-time basis and be the source of communication on web, mobiles, hand-held in an instant.

9. Accelerated Power Development and Reforms Programme (APDRP) – for actual, demonstrable performance in terms of sustained loss reduction and establishment of reliable and automated systems for sustained collection of accurate base line data, and the adoption of Information Technology in the areas of energy accounting are essential for taking up the regular distribution strengthening projects.

   GIS must power the APDRP and provide solutions across the entire enterprise for applications in business, engineering, environmental management, and other disciplines neces¬sary for comprehensive and effective power generation and transmission management. GIS must be used for planning and monitoring power generation resources. Sophisticated GIS analysis can deter¬mine optimum generation potential, formulating what-if scenarios, studying environmental impact, and manag¬ing facility assets. GIS is used to spatially analyze network congestion, consider growth opportunities for renewable energy sources, determine site feasibility, and create energy resource market scenarios.

10. Infrastructure sector has been a fundamental enabler for the modern economy and development of a nation and will be in focus for the next 5 years. Public-Private Partnership will be the key element of the strategy to avoid the all the tailback and delays in the implementation of the infrastructure projects especially in railways, power, highways, ports, airports and rural telecom.

    GIS can be the foundation for infrastructure development – be they in roads and highways, rail systems, airport infrastructure or other social infrastructure. A National GIS frame can be the foundation for a Road Information System, an Airport Management System etc a wide variety of enterprises.

11. Environment and Global Climate – where the focus must be on an Environmental Sensitivity Analysis and development of an effective Environmental clearance of development projects. In addition, the global climate change will have to be addressed aggressively by the new government and take up a good metrics of carbon credit analysis, framework Environmental Diplomacy and enable the arming with GIS and information for Global Conventions and negotiations.

    A National GIS base Environmental Information System and a GIS based Global Change Support system must be

organized and established. With GIS one can manage multiple types of environmental data (water quality, air quality and land quality) and global change data (carbon emissions, ozone, climate data, carbon credit etc); assess environmental sensitivity based on an integration of these data and improve workflow processes, from data gathering and analysis to publication and distribution of findings.

12. Unique ID Programme – to provide unique identification numbers or UID numbers to all citizens for accessing various government services and to own and operate a database of the UID numbers and be responsible for its updating and maintenance regularly. The UID will serve as a means to access a variety of government-related activities it will be used for providing services under government schemes such as the public distribution system, and the National Rural Employment Guarantee Scheme for families living below the poverty line. It will also be used for delivering financial and other assistance to the needy.

    We suggest that the UID programme be founded on GIS right form beginning – linking all administrative frames with citizen-ID which can be geo-tagged based on an address system. Thus, a GIS enabled UID can be linked to spatial assets – land, property etc and linked to geo-tagged public assets – PDS, NREGS, banks etc. This would be the first of its kind UID project that would be GIS enabled.

13. National Image Portal – a Portal that allows a single, seamless, most updated satellite/aerial image view of India and environs. With plans of Bhuvan by ISRO, the need for the hour is to have a seamless Image view from IRS images immediately. Such an Image Portal is most essential when IRS images are available at resolutions upto 1m and this must emerge as service to the nation.

    The GIS must be the foundation of this Image Portal and must have seamless IRS images of 1m or 2.5m and provide a "view hierarchy" based on multi-resolution images. The Images can then be registered to national GIS to provide an integrated map and Image view. Such a Portal can be valuable content for many citizens and applications.

14. Securing and Protecting the nation – one of the primary focus of the government is providing for the safety, security, and welfare of its citizens, communities, and assets. Protecting the homeland and its citizens is paramount for the government agencies of all sizes. Especially, after the Mumbai 26/11 episode the focus has to be on powering security internally and enabling a system that helps in detailing a plan of action for police and security agencies. An integrated system of pre-defined information, intelligence integration, communication system and auctioning systems are called for that will enable Police and Security agencies to be prepared.

    GIS has a proven track record for helping government agencies perform traditional tasks more efficiently and for carrying out previously impractical or seemingly impossible tasks - Analyze and improve response capabilities; Locate personnel, assets, and resources; Identify critical infrastructure and vulnerabilities; Develop training and education scenarios; Establish real-time situational awareness; Improve the timeliness and quality of decision support; Develop higher-quality contingency plans that are easy to access; Conduct data fusion and intelligence analysis.

Foundation of a national GIS

In India, ESRI India looks forward to the new government to provide a GIS STIMULUS thru its grand plans amidst the global economic scenario. While demand for GIS technology appears to be resilient, the challenge is that GIS applications work in silos within each department, with lots of resource duplication and not much meaningful sharing. We believe the need is for a India GIS Vision – which is Societal GIS - with multiple agencies sharing common a geospatial infrastructure with technology that allows sharing to occur thru server-based GIS.

A National GIS is of utmost importance ever now. The National GIS must pre-defined basic layers of information and be available that anybody would want – thus providing the common framework for further building of Applications and Solutions (rather than many users creating and re-creating this GIS foundation). For example, if anyone wants to take up any developmental activity in some district in India, at least if the basic layers of the existing administrative state/district/taluka/village boundaries, roads, rail network, rivers, water bodies, satellite images etc are available, then the same can form the base for any further Mapping and GIS activity. In fact, it would be a very good service to the citizens, private sector and government agencies.

The focus must be to allow each department to build its own data sets (on the National GIS) within its databases and integrate them through web services, and through server-based architecture. So data sets are shared with each department. This calls for an infrastructure for integration based on standards and a strong network. We believe that such a SDI is already on paper plan and can be implemented.

The 14 programmes that we identify would clear the path for an "active mashup" – a collection of mapping applications and web services that are combined into a single mapping application. Taking advantage of a variety of pre-developed services and functions, agencies can dramatically decrease development costs and data costs for their applications. In addition, performance is greatly improved.

"Server based enabling technology must be the foundation and this must evolve using mashup technology into a GIS farm of server based enterprise systems," says Mukund Rao, President of ESRI India. "This can still allow departments to "have their own systems" but when all "their own systems" are plugged to connect into a GIS Systems of Systems a federated national system can emerge that can address all government enterprise."

ESRI India believes that a National GIS would serve a nationalistic goal and that it would be good for the country and the government to promote the concept of a uniform and common National GIS at different scales – mainly as a uniform, single GIS for the whole country - thus clearly promoting India as it should be (and not as one wants to make of its boundaries, features and details in their own way). The government must take lead in this and could pay for establishing the National GIS, the cost of maintaining it in the cloud remains controversial. ESRI calls it a 'free way' or 'toll way' issue.

ESRI India – Committed to National Development

ESRI India is a joint venture of 2 major international cultures – ESRI and NIIT and together we offer the best practices in GIS that can strengthen governance and bring meaning and visibility to national development. We believe that the new government must look at GIS as a base frame and use its capability to stimuli its various programmes – thereby not only strengthening its programmes but also catalysing the nascent GIS industry in the country and charge it to commit to national development in a suitable model of implementation.

ESRI India is committed to and offers to take the FIRST STEP and provide its world famous ESRI suite of products, its world-renowned technical expertise and its nationally committed professionals to develop and nurture these national programmes by ingesting into it the GIS stimulus that will make the governmental endeavour bring visible benefit to government, enterprise and citizens as a whole – thus SURGING INDIA AHEAD.

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GIS Enabling Better Governance: A tool for Parliamentarians

R S Pawar, Chairman, NIIT, rspawar@niit.com

I was wondering what to speak about this time and how to bring that difference that will make GIS more meaningful and relevance today. The fact that we are having elections is one difference I see this time when we are having this UC. Soon we will have a new set of Parliamentarians readying themselves to build and drive India to further heights. We will have a new government that will make the best of plans for better governance and holistic development at various levels and thrust for improving the quality of life of its citizens. The focus nowadays is on Governance – governance basically meaning better managing and enabling geographies and its entities or stake-holders, geographies of villages or constituencies or districts or state or finally the nation. So I decided to address our elected representatives – be they Members of Parliament or Members of State Assemblies or Municipalities – in a sense whatever geographies they represent and address governance issues for their geographies.

According to me, managing geographies will call for being able to best understand and map the variability and disparities, assess its strengths, relate these to near-by geographies (districts or states) in a geography and be able to make a sound and correct decision of the development and governance issues. It is clear that if we are to achieve a transition into a sustainable society, we have to create a geography where every individual has an opportunity for a productive, secure and healthy life. The need of the hour is thus adopting sustainable strategies for an geographically benign and socially forward-looking development process.

I must emphasize here that managing geographies is not just managing statistics or numbers as it has proven that these do not give a correct visualization of the geography-assets or entities but what is more important is to be able to visualize the locations, entities, assets and see their inter-relationships. A statistic or table is too static and rigid but a geographic visualization through images, maps, charts, graphs etc makes it immediately more comprehendible and very useful to bring an assessment of disparities, gaps, strengths and its potentials.

Thus, managing geographies will be fundamental to bring equity – equity of development, equity of opportunities and equity of quality of life.

I feel that such a GIS must be a part of each MP or MLAs governance kitty and with such a product available they will be best able to make sound and scientific decisions for their constituencies (geographies) and bring better governance.

The nation has best of images from its satellites, it has maps for all geographies available, it has village-wise census data available digitalized, it has developmental data at each village, it has tremendous developmental programmes, it has beneficiary data in many cases and ESRI India would bring the best of GIS solutions. By making a collaborative process, we hope to promote and build a GIS product that will be easy-to-use and would enable citizens, administrators, elected representatives and policy-makers.

What an impact such a product can make in the constituency management and governance to ~800 MPs, ~4500 MLAs and almost more than 10,000+ Municipal corporators in India!!!

My pitch is covering three scenarios that I present below – mainly linked to elected representatives and how the geographies of constituencies matter most.

There could be many more such examples that can be provided – all of which could be the foundation for good governance and for our new leaders to assess and evaluate their geographies and make best judgement of governance and development in their constituencies.

Through this paper, I wish to raise the call for our newly elected Parliamentarians to adopt GIS and promote its widest use – both within their constituencies and within the government. They would benefit from the technology and transparency and scientific assessment that they can get from GIS and bring more direct and successful benefit to the people of India.

Both NIIT and ESRI would work on these lines and this would be a major agenda for us this year to MAKE THE DIFFERENCE OF GIS.

Scenario 1: For Getting Elected – the GIS Solution	Scenario 2: During 5-year Tenure: Plan for development in Constituency	Scenario 3: After Tenure
1. Analyze the demography of the geography in terms of socioeconomic status (education, religion, caste, sex, economic status etc) and map them 2. Identify demand and aspirations in a spatial context 3. Map and analyse resource excess and gaps 4. Analyze strengths and weaknesses with respect to above data. Plan campaign and focus areas. 5. Understand critical needs and past issues in the constituency 6. Based on the above prepare election manifesto and poll agenda 7. Represents data geographically, which is easy to comprehend and analyze. It provides data in layers such as population, financial health, literacy, service availability etc. 8. GIS will highlight and indicate critical areas which require focus. It will do so by the use of indicators. The indicators form the business logic for analysis of the data.	1. Micro level mapping of needs/ aspirations for the constituency 2. Identify development areas vis-à-vis present issues in map form 3. Map the resources and map gaps 4. Prioritize geographic areas of resources conservation, development and sustainability 5. Understand various national and state level programs being implemented and map their impact to the geography 6. Identify, plan and map solutions to issues. Allocate funds and map funds allocation and usage 7. Map execution of plans and their progress temporally 8. Monitor plans of development and re-assess disparities temporally 9. Provide the elected representative with complete maps for his constituency 10. Help quantify and map the quality of life of the citizens using indicators such as Mobility, Water, Electricity, Public Health, Public Safety, Public Amenities, Environment & Ecology etc. 11. Apply these indicators to identify problem areas. 12. Prioritize the issues based on severity. Areas having lowest indicator score get maximum priority.	1. A map view of all development schemes undertaken during his tenure. 2. Status of schemes such as completion status, fund outflow, etc. 3. Identify achievement and failures 4. Perform root cause analysis of failures and plan strategies 5. The GIS provides a spatial inventory of all development schemes executed. 6. Status of schemes, fund outflow etc are also available in the spatial database 7. It provides a snapshot in the form of a maps showing projects executed, success and failures 8. Change Analysis temporally and improvements map. 9. Identify new developmental projects based on the above inputs.

Power - The GIS Thrust for R-APDRP

Ministry of Power, Govt. of India, has launched the Restructured Accelerated Power Development and Reforms Programme (Restructured APDRP) in the 11th Five year Plan with a major thrust for modernizing and boosting Power distribution and usage to bring about the efficiency and improve financial health of the power sector.

With the initiative of the Government of India and of the States, the Accelerated Power Development & Reform Programme (APDRP) was launched in 2001, for the strengthening of Sub – Transmission and Distribution network and reduction in Aggregate Technical & Commercial (AT&C) losses. The main objective of the programme was to bring AT&C losses below 15% in five years in urban and in high-density areas. The APDRP programme has been restructured by the Government of India, so that the desired level of 15% AT&C loss could be achieved by the end of 11th plan.

However, due to lack of adequate investment on Transmission & Distribution (T&D) works, the T&D losses have been consistently on higher side, and reached to the level of 32.86% in the year 2000-01.The reduction of these losses was essential to bring economic viability to the State Utilities.

High technical losses in the system are primarily due to inadequate investments over the years for system improvement works, which has resulted in unplanned extensions of the distribution lines, overloading of the system elements like transformers and conductors, and lack of adequate reactive power support.

The commercial losses are mainly due to low metering efficiency, theft & pilferages. This may be eliminated by improving metering efficiency, proper energy accounting & auditing and improved billing & collection efficiency. Fixing of accountability of the personnel / feeder managers may help considerably in reduction of AT&C loss.

While GIS has been a very important technology for various organizations, the awareness of the immense value that GIS can bring to Power Utilities is rapidly increasing amongst Power Utility organizations. Power Utilities are increasingly looking to GIS as an integral component of their Enterprise Infrastructure. Integrated with other Enterprise Systems like ERP, Network/Distribution Management System (NMS/DMS), SCADA, GIS helps utilities in efficiently managing assets, designs and outages. There are a large number of tangible and intangible benefits that utilities, large and small, are gaining through GIS.

Power distribution companies in India are looking to reducing losses, improve commercial viability, minimize outages and improve customer satisfaction. The R-APDRP initiative aims to leverage strength of information technology for creation of authentic base line data and support utilities in IT enablement of their business processes. The key components in this initiative have been identified as Consumer Indexing, GIS Mapping, Metering of Distribution Transformers and Feeders, and Automatic Data Logging for all Distribution Transformers and Feeders and SCADA / DMS system. The complete solution will be an integrated one with data sharing between the various components.

GIS is one of the major thrust for R-APDRP solutions as it will aid:

- Reduction of AT&C losses
- Reduce outages & interruptions
- Bringing about commercial viability in the sector
- Increase consumer satisfaction
- Investment component for up gradation & strengthening of distribution network with focus on urban & high density areas
- Incentive component to motivate state utilities to reduce their cash loss

The GIS work for R-APDRP envisages creating centralized datacenter housing the network, consumer, assets database and application layer for bringing efficiency for R-APDRP. Together with IT infrastructure, GIS would form the core of the database

and applications layer. So the Power Discoms will have to:

- Implement an Enterprise GIS based application integrated with other business process application such as Energy Audit, Billing, Network Analysis, Customer Care Center, SCADA / DMS etc.
- Create indexed customer and asset data base and mapping on GIS platform.
- Use Satellite imagery as base map and physical survey map using DGPS/ Total Station shall be geo referenced and digitized to create accurate representation of utilities assets and customers.

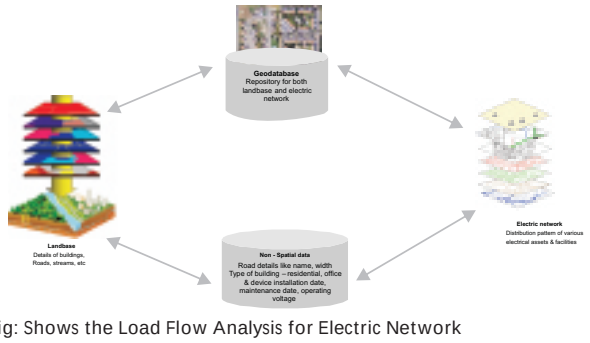

Fig: Shows the Load Flow Analysis for Electric Network

GIS in Power Utility captures information in various layers and represents it in the form of a map. These layers correspond to the distribution network, land base detailing including roads, landmarks, buildings, rivers, railway crossings etc. Going further, it also maintains information on the equipment viz. underground cables, conductors, transformers, towers etc.

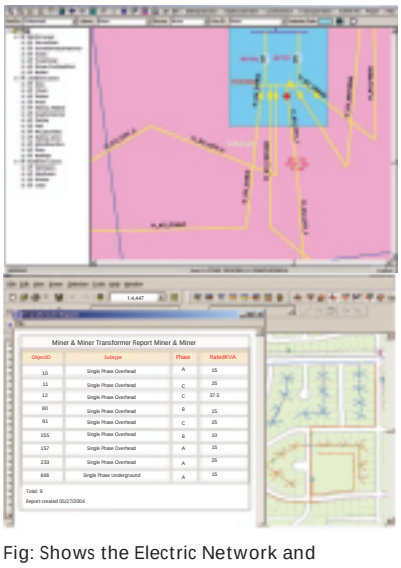

Fig: Shows the Electric Network and Transformer details in GIS

The GIS implementation will make it easy even for a new electrical engineer at the Power Discoms to understand the network on a division/ sub-division / section basis, thus reducing the dependency on the lineman. Moreover, GIS maps the network on a feeder-wise basis (feeder is a circuit that carries a large block of power from the service equipment to a sub-feeder panel at which the block power is broken into smaller circuits). As a result, just by clicking the consumer location in the GIS map, the electrical engineer is able to find its complete feeding path including its feeder identity, feeding substation, specific switch in that substation and cables/ conductor connected to that consumer. This functionality will help Power Discoms to easily trace affected consumers in cases of planned and unplanned outages and load shedding.

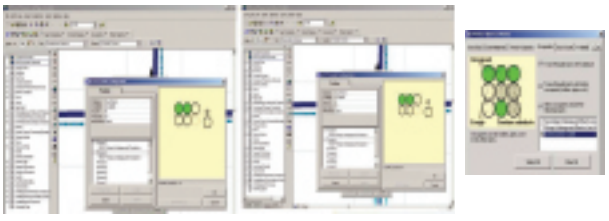

Fig: Shows the underground cable in GIS

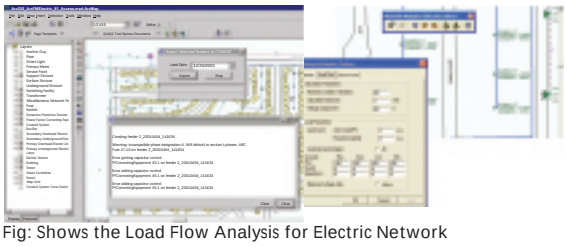

Fig: Shows the Load Flow Analysis for Electric Network

The GIS will also aid to pinpoint underground cable faults that occur due to the damage to the cable by external authorities while carrying out road excavation work. GIS helps the crew working on the field to locate the fault in the defective feeder section (cable) within a shorter time. In most cases, cable faults are not visible as the cables are placed underground.

GIS enabled Energy Loss Mapping solution will help Power Discoms to identify suspicious/ loss areas. This problem could arise due to the overlapping of different feeder distribution networks. This energy accounting information along with the service point (Customer Delivery Point) meter tampering data on top of the GIS map will facilitate the detection of probable area/ service points of pilferage.

The energy audit report presented in GIS will display the network loss in percentage and units on GIS background. The application will provide a proper mechanism to draw a boundary of the network for which the loss is calculated. Thus, loss calculated at a particular point in the network can be aggregated to the particular area or cluster (viz. industrial, commercial or residential) and can prompt the Energy Audit department to take specific actions like identification of unauthorized connections/ removal of pilferage etc.

In Power utility life-cycle management, GIS based Network Planning plays a significant role. Planning for growth of the Electrical Network can be made easier by providing visibility of prospects on land-base with the Network features in the proximity. The planning making use of GIS based Network Analysis helps the planner for the current and accurate network data for load flow, short circuit analysis, new connection and contingency management.

In emergency situations such as floods, water logging etc, logistics needs to be tackled. Geospatial solution helps the users to identify their assets/facilities in the low lying areas and take a proactive action on the same.

Decision makers at the Power Discoms can leverage the GIS to get a geographical analysis of revenue realisation for better understanding of loss and profit areas. The GIS analysis can give area-wise change in sales revenue as compared to previous month sales. This will help them to focus on particular areas for improving collection efficiency and minimizing pilferage enabling overall improvement in the financial health of the power sector which in turn will result in better power distribution to the Community.

ESRI India, a GIS company that endeavors to provide end-to-end GIS based solutions ranging from software products, application development, training, data conversion and technical support. ESRI India today enjoys market leadership in the field of GIS with largest installation base across different vertical segments in India, Nepal and Bhutan.

We at ESRI India have the credentials to add value to every project, every design, and every effort. We consistently make a commitment to invest in reaching technologies. ESRI India has excelled with its capability to utilize GIS as a tool to solve our client's problems in a very broad spectrum of markets including utilities. Our service offerings include consulting, multi-lingual geospatial software application development, image processing and interpretation to include photogrammetry and LiDAR, spatial modeling, database development and training.

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GIS for Rural Upliftment

"India is a nation with over 300 million poor people, a number that has barely declined over the last three decades of development. It is clear that rapid growth will be essential to reduce the number of the poor and for sustainable poverty reduction, but for growth to benefit the poor disproportionately, it will have to be accompanied by more rapid employment expansion than hitherto, greater investment in health, education, water/sanitation, and child nutrition than so far, and directly targeted poverty-reduction programmes". (Source: Planning commission of India)

The above statements are from the planning commission report for the XI five year plan, the rural development section. Rural development has obviously a very important sector with a focus on the need to uplift the standard of living and provide basic needs such as health care, education, sanitation, water, nutrition etc. The unique thing though is the focus on employment. Why? Simple answer employment leads to income, which leads to better nutrition, water, health, education etc. In other words; while health, education, nutrition etc are important the catalyst for the development of rural population lies in providing employment. Employment brings sustainability, self reliance and security which in turn will boost the economic well being and the overall quality of life of the citizens.

The second issue which is clearly highlighted by the planning commission in its report is the need for security and clarity of land rights. "Access to land and legal security of tenure are strategic prerequisites for the provision of adequate shelter for all and for the development of sustainable human settlements affecting both urban and rural areas." Land is the prime resource of the vast majority of the poor in India deriving livelihood from agriculture. The Land Administration is plagued by many infirmities. Unclear titles, informal tenancy arrangements, and other related problems have not only affected productivity of agriculture, they have also forced migration of people, both landless and marginal farmers, in search of employment to urban areas as well as of the landed gentry, giving rise to absentee landlordism, who do not lease out land for fear of losing the land titles. Therefore, an efficient and corruption free land administration, coupled with a dynamically adaptive land policy, has a vital role in increasing agriculture growth and poverty reduction.

Fig 4.1
Panchayat Villages Satisfying the criteria for JGSY scheme,Salem District

Fig 4.2
Panchayat Villages where JGSY is to be first implemented, Salem District

The key elements of an effective land policy are the following:

- Modernization of management of land records.
- Reforms relating to land ceiling.

- Security of homestead rights.
- Reforms relating to tenancy laws.
- Protection of the rights in land of tribals.
- Access to agricultural services.

(Source: Planning Commission of India)

Thus a clear focus is on education to empower our rural community and on the other had issues related to land rights needs to be streamlined so as to bring in transparency, security and stability.

How can GIS help?

GIS is a computer aided system or tool to generate, manipulate, analyze spatial/ map data. Visualize a scenario where we see spatial layers of Area/Block maps, Road network, present schools/institutions point layer, etc. You will be able to comprehend information faster and in much more efficient manner as compared to seeing numerous tables in scattered sheets.

The objective of rural employment scheme is to improve the quality of life of the rural poor by providing gainful employment. In doing this GIS can assist in two ways:

1. Planning: Identifying areas where these schemes need to implemented as per priority.
2. Monitoring: Monitor the progress of plan through certain measurable indicators

In terms of planning GIS helps identify and prioritize the villages requiring implementation of scheme. The identification can be done using various parameters such as number of unemployed people, SC/ST, economic status, number of handicapped persons etc. GIS helps collate all this information and analyze into results helping decision makers make efficient informed decisions.

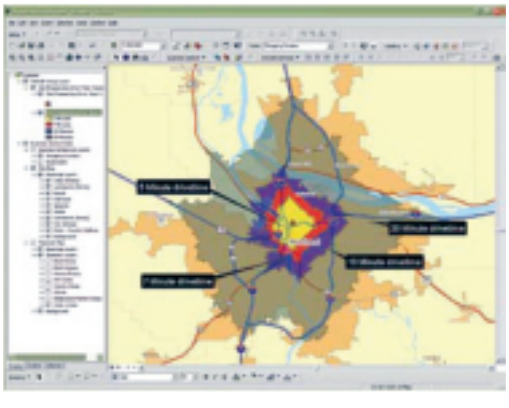
Similarly GIS also help monitor plans. It can make use of the indicators as mentioned above to display the status and effectiveness of plans. It can inform the implementing agencies well in time of the positive/ negative progress of plan, cause of delays and changes/ variations implemented.

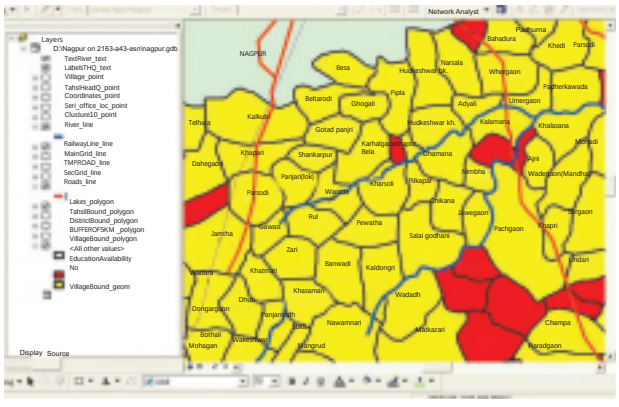
The greatest enabler of employment is education. We will not do justice to this paper if we do not discuss education and the role of GIS in the same. Now if we need to find out where a new school needs to be set-up a GIS based system can suggest potential areas based on criteria's defines which will further help in analyzing and thus eventually giving solutions for strategically setting up schools. Furthermore adding Census data will give an idea of the distribution of total population in the area, the total number of males and females, age wise classification of population (males and females), etc.

As a planner you need to know critical information such as:

- Where are my schools presently located?
- What is the population of students in the area?
- How much portion of the local population can they service?
- How are they equipped?
- What is drive time to the school?
- Where are the drop-outs happening?
- Etc…

Close observation of these questions revel that the questions are spatially and non-spatially oriented. Secondly you may not get all data in one single visualization environment. In other words the ability to analyze and visualize all data in one go. GIS is a tool with the capability to collate data from various disparate sources analyze the same and display results in a comprehendible manner. The above questions when answered in such a manner lead to well planned decisions of where to invest critical resources and derive





outputs as per targets. With GIS applications one can plan the development and implementation of existing and new schools:

- Prioritize schools for development
- Identify site for new schools
- Perform Drive time analysis
- Plot service areas
- Generate charts and reports of schools based on various parameters like:
  - Grade of schools
  - Equipment and staff availability
  - Student strength
  - Male to Female ratio
  - Schools under Grants/ schemes
- Etc….

In terms of our second issue pertaining to land records management GIS has a very critical role to play in the development of the system. Today many organizations today, have realized the importance of mordenisation and automation of land information and are taking steps for implementation of a Geographic Information Systems (GIS) based Land Information System. GIS is a tool that can be effectively used for better visualization and spatial analysis applications. Maps are a powerful medium for planning, analysis and monitoring.

The development of an effective Land Information System involves primarily three components i.e. data generation, data management and data dissemination.

1. Data Generation

   In most Land management agencies generation of latest data has become the most critical need of the hour. In fact in many of the case there is no alternative but to resurvey and generate fresh data.

2. Data Management

   Creating and maintaining an effective land administration system is a multifaceted process often managed by many disparate agencies and organizations. Duplicated efforts and data quality problems are common. Although separate GIS applications have been used to manage individual aspects of land records in the past, the full potential of GIS can best be realized when applied across the entire cadastre workflow.

3. Data Delivery

   One of the key initiatives of any Land management agency is also to disseminate the data for the end users. More so data needs to be disseminated in manner which is easy to search, analyze and visualize. Using the later GIS server technology, data available in the LIS can now be published on the internet in a highly secure way. The users can this land information portal to retrieve information using a standard web browser, without actually having to visit the office. Information with regards to any parcel can be made available to the end user on the click of a mouse. This would in turn save taxpayers a significant amount of money and add value to their experience with government as their needs are better serviced.

In summary, GIS is a very effective decision support tool for making sound decisions, clear implementation plans and effective monitoring of these plans leading to the upliftment of our rural communities.

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Spatial Data Infrastructure: Future's Direction Initiative

Decision-makers today sieve through a large amount of data. Perception of "spatial" information – information in map format, with proper scales, legend, symbolization, colors etc, enhance the understanding of "information inter-relationships" and thus contribute to a more appropriate locale-specific developmental strategy definition. To maintain such a volume of data from a variety of different sources, a Spatial Data Infrastructure provides a framework to collate standardized information from many identified and selected sources. It is a framework of spatial data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way and thus aid in optimized and rationalized use of spatial data.

In the wake of rapid changes taking place in the fields of Surveying and Mapping, a SDI acts as a central authority under the direction and supervision of government administrative machinery for the multifarious development activities.

As an example, the NSDI India initiative acts as a single window mechanism for providing access to the spatial data being generated and managed by various agencies in the country. It is visualized as a network of databases consisting of the domain specific databases created and managed by various agencies like Survey of India, Geological Survey of India etc. to cater for data at community,local, regional and rational level for sustainable development which can be utilized to model and analyze the desired information in various scenarios and different levels as shown below :

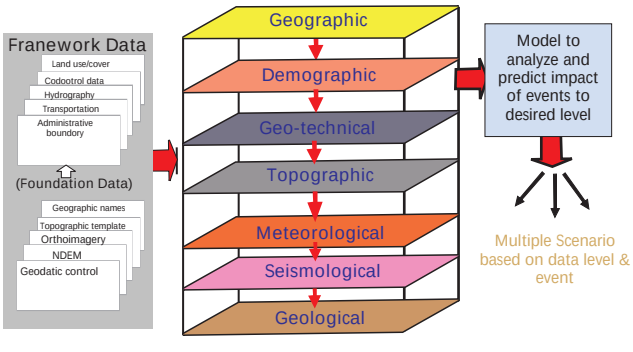

Figure a: Multilayered geospatial data from various sources

Spatial Data Infrastructure has a fundamental role to play at the national and regional levels in ensuring the successful implementation of regional SDI initiatives and in facilitating sustainable development. Hence emphasis should be given to standardization, specification and production processes of spatial data, and should be supported with policies, metadata, dictionaries, format of data exchange, establishment of databases and networks.

The adoption of standards and specifications will lead to a much wider applications in the government, industry and private sector applications, as well as the ease of GIS implementation processes. The standardization aims to develop a new more efficient and more functional automated system for mapping, records management, planning and other functions. This will help improve countries ability to accomplish the goals of the new standardization Plan.

Also, sharing of data requires common standards and interoperable practices meeting the needs of all nations. Many organizations need a GIS capable of integrating services and data from multiple sources and in different formats. ESRI's technology and products support this level of interoperability, and its active role in the development of open standards has helped ensure that ESRI® data can be easily accessed by other technologies and applications. ESRI products support numerous data converters and direct read access including Spatial Data Transfer Standard (SDTS), Vector Product Format (VPF), imagery, computer-aided design (CAD) files, digital line graph (DLG), and TIGER®. In addition to supporting standard data formats, ESRI also supports a standard metadata representation which is crucial to build a strong spatial data infrastructure.

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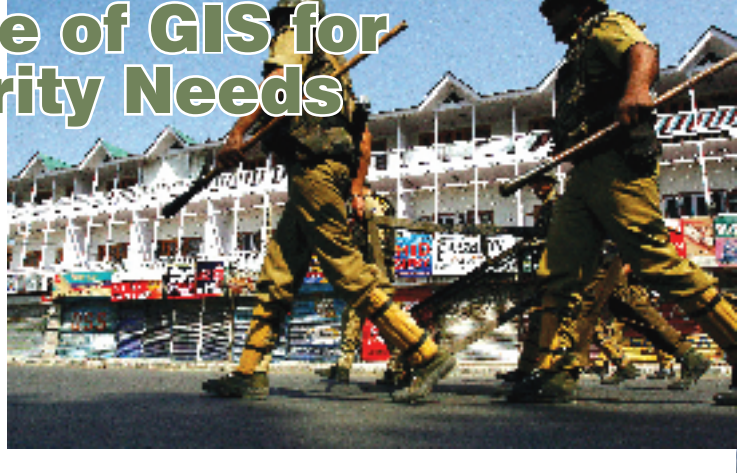
Maximising the Use of GIS for Defence and Security Needs



India's security concerns are defined by a dynamic global security environment. The continuing presence of terrorist and fundamentalist forces all around has prompted India to maintain a high level of defence vigilance and preparedness to face any challenge to its security. The defence forces need to set up new real time software systems. Indian Defence is in the state of creating an integrated force operating in a unified battle space; with seamless communications; highly sophisticated space based and terrestrial surveillance systems and with operational C4I2 systems. This convergence of various technologies and capabilities can impart the forces with force-multiplier benefits through enterprise systems.

Enterprise GIS is now widely used during the wars, businesses, and strategic intelligence domains in many nations around the world. By definition, an enterprise GIS must necessarily conform to IT industry standards. This creates a fundamentally open and interoperable infrastructure that doesn't just serve C4ISR needs or just defence needs or even just national needs, it provides a common framework for collaboration within and between all communities of use. This common infrastructure is critical in today's security climate.

A key part of a defense wide infrastructure is the spatial information and spatial tools-the enterprise GIS. As a defense wide infrastructure, the enterprise GIS is simultaneously able to support war fighting missions such as command and control,

business missions such as installation management, and strategic intelligence missions such as spatial data production.

The network creates the bearer to connect sensors to databases to decision support systems. In the past, the connector from sensor to database has often involved off-line, manual processing - temporal distortion has occurred as changes monitored by the sensor are delayed. Today, the power of computing platforms, increasing bandwidth and smart commercial IT companies are coming together to more directly linked sensor to database to decision support. Real time video feeds from UAVs can be ortho-rectified in real time into the common operational picture; automated target recognition algorithms are being developed to run on COTS GIS platforms.

An enterprise infrastructure cannot be built on old technology platforms with interoperability and openness added on as afterthoughts. Interoperability has to be engineered into the core of an enterprise IT platform and from the fundamentally open perspective of a cross platform, multi-DBMS, multi-architecture information system.

Interoperability must be engineered into the GIS platform based on the premise that system designers should be free to define the enterprise IT architecture and implement GIS capabilities as part of it. This approach to interoperability demands embracing open industry standards that define all modern computing platforms-XML, SOAP, SQL, and others-in an inclusive manner. A vendor's support for services-oriented architecture (SOA) must not preclude the adoption of stand-alone, peer-to-peer, and client/server architectures and should permit interoperability with legacy systems.

GIS technology is a critical part of the information technology infrastructure for defense and intelligence. It integrates data from intelligence, surveillance, and reconnaissance to create spatially aware databases (geodatabases) across multiple networks. Spatial context and relationships between sensors and other battlespace entities and actions are maintained within these geodatabases, providing an integrated platform for military planners, intelligence analysts, and decision makers to better understand common operational and tactical situations.

GIS is rapidly moving from its historic niche usage within defence to becoming a critical defence wide infrastructure. The assessment is based on the fact that defence operations of all kinds depend on a sound understanding of terrain or geography. This involves more than an understanding of location—geography is a science that creates a framework for understanding the relationships between all entities in an area of interest. This, in turn, nurtures the development of spatial knowledge from the pool of data.

Since almost everything military personnel do, particularly on the battlefield, involves some kind of spatial relationship, the ability to manage information about these relationships and perform analyses on this data is critical. GIS integrates the factors of geography and terrain into IT support for military and intelligence decision making. GIS enables this type of information to be created, queried, analyzed, and displayed in real time – in a variety of formats – and tailored to the specific needs of each user. Spatial data can not only be easily and quickly integrated with other defence relevant data, but it can also be readily shared and refreshed, ensuring that all concerned individuals have the benefit of the best, most recent, and most valid information. GIS, in short, is integral to the Common Operational Picture.

GIS has long been used in the Defence sector - but historic usage has been focused on specific domains such as terrain analysis, map production or facility management. A new breed of GIS technology is emerging, which is critical to defence infrastructure. Enterprise GIS platforms are taking their place in the defence information infrastructure and forming an interoperable foundation for the transfer of battlespace knowledge.

New strategic imperatives are driving the uptake of GIS as a critically important technology. The battlespace is unpredictable; forces are more dispersed; decisions need to be faster; the consequences of poor decisions immediately catch the headlines. It used to suffice to factor time and space into the decision cycle on an ad hoc basis the occasional glance at a map, the infrequent provision of an analysis result. The historic niche usage of GIS as a specialist's technology met this need well. Today, information centric operations demand that time and space are an integral part of information infrastructure. Thus is the role of enterprise GIS platform to become an integral part of a broader information infrastructure.

This marks a fundamental shift in the nature of GIS as a technology and one that has caused some degree of confusion in the industry. The confusion stems from misunderstanding the nature of an information system. An information system is about more than just data - it encompasses the business logic of an organization (including the workflows, data flows and processing of information) and the presentation of information. So the argument that the handling of spatial data within a DBMS constitutes an enterprise GIS is missing the point. Of course an enterprise GIS handles spatial data within a range of DBMS and file environments - but much more importantly, it also manages data models, process models, visualization templates (the maps and globes) and metadata.

The raw data that measures time and space come from a wide range of sensors. Perhaps the most important role of an enterprise GIS is to connect to these sensors in a manner that ensures minimal temporal and spatial distortion - sensor measurements arrive in the decision support environment fast and accurately. Because they are accurate and timely, fusion is a natural result of maintaining the geographic context from sensor to decision maker. The enterprise GIS platform enables the breaking down of stovepipes that divided systems in the past to provide a common framework for handling spatial information across all defence systems. This is important because the government avoids paying repeatedly for developing the same core functions for each system - the magnitude of licensing costs would certainly be lower than building systems from scratch. It also ensures that the defence user receives the latest capabilities from the commercial off-the-shelf software community.

ESRI's support for SOA adopts stand-alone, peer-to-peer, and client/server architectures and permits interoperability with legacy systems. This critical strength enables one platform to support web service capabilities for network operations and fall back to stand-alone operations in case of network failure. Also, it supports application migration from file-based data during prototyping to peer-to-peer in initial deployment to full services-oriented network architecture—the same application can support all phases of new architecture development.

ESRI offers the world's most open, interoperable geospatial solution in use within the Defence and National Security community today, with mission-critical applications as diverse as command and control, base operations and facility management, force protection and security, environmental security and resource management, intelligence, surveillance, and reconnaissance systems, logistics, mission planning, modeling, simulation, and training, terrain analysis, inter-visibility and threat analysis, 3-D mission planning, line of sight analysis, trafficability and supply routes, DTED Generation and target detection/ change detection.

Since 1969, ESRI has been helping people solve real-world geographic problems in a wide range of domains. For the last 15 years, ESRI's software has been used in the most demanding of domains—the defence and intelligence community. Today, the ArcGIS platform is helping users in every service, throughout most defence domains, and in many nations around the world.

Enterprise geospatial solutions and Web services from ESRI help governments and businesses solve complex problems and create new business value—higher productivity, doing more with less, better product or service differentiation, and improved customer loyalty.

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Urban Sector Management In India – Prospects

Urban India has now come to be recognized as a significant contributor to the country's economic development the contribution of the urban sector to the national economy in terms of the GDP has increased from 29% in 1950–51 to 47% in 1980–81 and currently the contribution stands around 63% of the GDP. This is further estimated to increase to 75% by 2021. Though the degree of urbanization in India is about 28% which is lower than many of its neighbouring countries about 70% of this urban population is concentrated in its large cities and city agglomerations. On the contrary the formation of new towns as well as rural settlements growing up to move into an urban status is very low.

Management of such a magnitude and distribution of the urban population calls for extra efforts by city planners and managers to cope up with the ever-growing strain on the urban infrastructure. Special attention is needed for planning, monitoring and governance of urban areas which are at present fragmented between different State-level agencies and urban local bodies (ULBs), with lack of co-ordination. Planning activities involving spatial databases are not correlated with the sectoral/departmental data generated as a result the data generated at various levels for urban planning and management remains uncoordinated and redundant to support decision-making.

Spatial information like images and maps, form the foundation and basis for most planning and implementation of developmental activities; infrastructure development; disaster management support; environmental monitoring; natural resources management; business geographic and many other national activities.

Government's Initiatives

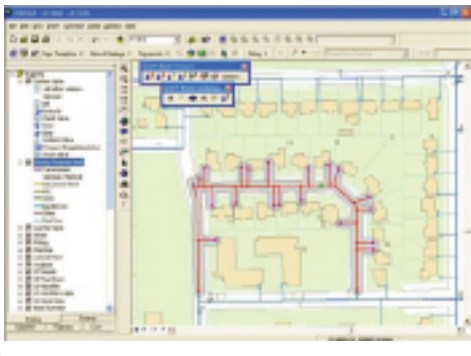
The Govt. while on one hand is finalizing a National Urbanization Policy it has gone ahead and introduced major programmes to meet the changing economic scenario, reform agenda of Jawaharlal Nehru National Urban Renewal Mission (JNNURM), and National Urban Information Systems (NUIS) among other national schemes and programmes. Eventually the objectives of balanced and sustainable development are to be achieved by reducing spatial disparities.

The Government of India is constantly emerging as a facilitator in various reform initiatives such as property tax reforms, municipal accounting reforms, model municipal law, guidelines on private sector participation, etc. The State Governments play a similar role to facilitate the Urban Local Bodies (ULBs) in order to provide an enabling environment for the ULBs to function as effective units of self-governance at the local level. Urban poverty alleviation, slum up gradation, and basic services to the urban poor will continue to remain as functions belonging to the public domain.

The role of private sector in urban sector also is steadily growing as basically service provision in municipal infrastructure, utilities, sanitation, property cadastre database and GIS based Master Planning.

National Urban Information System (NUIS)

The major objective of the NUIS is to establish a comprehensive Geographic Information system (GIS) in the ULBs for planning, management, and decentralized governance in the context of implementation of the 74th CAA. The major activities that are included under this project are as follows:



I. Mapping at 1:10000 scale from satellite images, 1:2000 scale from aerial photos, and 1:1000 scale utility mapping for 24 towns being taken up by Survey of India.

II. Establishment of NUIS cells in State nodal agencies.

III. Setting up of National Urban Databank and Indicator in each State nodal agency.

IV. Capacity building among town planners for use of modern automated methods.

Implementation of National Urban Information System (NUIS) with above objectives is expected to result in following achievements:

- Planning and Management of urban settlements will be based on updated and scientific database as a decision support system, employing modern planning methods using Geographic Information System (GIS) technology.
- Data generation, storage and manipulation using spatial and attribute information base supporting development of urban indices for NUO.
- Standardised GIS database, methodologies and procedures to enable easy integration and sharing of information and replicability of procedures.
- Build capacity among town planning and allied departments and create a cadre of professionals for the use of modern automated methods, envisaged under NUIS.

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM)

JNNURM though initiated during the 10th Five Year Plan covering 63 towns it has assumed a prominent position among the Govt. schemes in the urban sector. With a clear emphasis on upping the spend on infrastructure and social sector, the administrative ministries are seeking more than double the allocation of funds under the UPA government's flagship Jawaharlal Nehru National Urban Renewal Mission for the next fiscal. They have proposed an allocation of Rs 17,054 crore for the next fiscal as against Rs 6,890 crore allotted in Union Budget 2008-09.

This JNNURM programme seeks to fulfil the Millennium Development Goals, and is envisaged to operate in a Mission mode by facilitating investments in the urban sector. The Mission seeks to achieve the objective of integrated development of cities, for which the cities are required to formulate a City Development Plan (CDP), bringing out long-term vision for the cities and support their efforts through funding of project proposals. The essential requirement of the Mission is implementation of urban reforms, within the Mission period. The Mission also aims to leverage and incorporate private sector efficiencies in development, management, implementation, and financing of projects, through PPP arrangements, wherever appropriate.

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) will continue to focus on infrastructure, basic services and governance reform and increase support to cities to upgrade public transport. The JNNURM with its two simultaneous objectives - urban infrastructure governance and basic services to the urban poor hold great promise in an opportunity for improving the conditions of the urban poor while launching the urban renewal mission. Often, the economic liberalisation and globalization policies of governments worldwide are blamed for the worsening condition of the poorer sections of society. Some parts of reforms agenda like the compulsory computerisation of land records data, changing accounting norms are good, the experiment of letting local bodies will be market friendly and competent to attract direct funding. The mission also takes care of all related aspects like transportation, environment management, land use.

How GIS can be useful in implementing these ongoing Government Initatives.

National regional, state, district and local planning agencies have realized the power of enterprise GIS to identify problems, respond to them efficiently, and share the results with the public. GIS solutions provide tools to help you reach your agency mission while doing more and spending less. GIS solutions aid the requirements of urban planning and management by:

- Creating a spatial database at ULB(Urban Local Body) level for monitoring and management
- Map assets such as electric, water, gas and telecom utilities.
- Enabling preparation of Master plan and zonal plan.
- Integrates conventional data sources and legacy systems and brings all data together in a geographic framework
- Creates a common operating framework for various departments and agencies
- Support collaboration and cooperation among and across departments and organizations, regardless of GIS platform.
- Seamlessly integrates with existing geospatial business processes
- Assists use of urban indicators for National Urban Observatory

- Provides a common spatial envioronment for generation, storage and manupilation at various levels of planning and implementatio n and monitoring.

Today state-of-the-art GIS technology along with application development, meet the requirement of not only development of GIS databases; but also design and execute Municipal enterprise GIS applications extending over multiple departments in a local government providing end-to-end solutions such as:

Town and Country Planning

Every day, planners use geographic information system (GIS) technology to research, develop, implement, and monitor the progress of their plans. GIS provides planners, surveyors, and engineers with the tools they need to design and map their neighborhoods and cities. Planners have the technical expertise, political savvy, and fiscal understanding to transform a vision of tomorrow into a strategic action plan for today, and they use GIS to facilitate the decision-making process.

Municipal Administration / E-Governance

E-government is using the Internet and GIS to create more effective government. The combination of readily available Internet access and maps lets governments provide a new level of service to both businesses and the public. It is making collaboration between government agencies possible in new and powerful ways. The strong data integration abilities of GIS let governments truly capitalize on data existing in legacy systems. GIS-enabled Web sites can provide services, such as online mapping, fee payment, and application submission, that were not previously available. Three categories of e-government applications have developed: government to business, government to citizens, and government to government.

Property Tax & Revenue

Tax collection towards property forms a key revenue source for any ULB. The key issues in most cities is that considerable number of properties have not be accounted for and those that are included are inaccurately assessed. GIS solutions enable storage of the records of each and every property and tracking of the payment status, and display of tax collection status as a report as well as on map.

Land Administration / Management

The Land Administration is plagued by many infirmities. Unclear titles, informal tenancy arrangements, and other related problems. Building of a Land Information & Management System involves three major components namely Data, application and process. ESRI India provides end-to-end solution from data creation to management to delivery.

Traffic & Transportation Management

Public works professionals use GIS to design and maintain safe, clean roadways. GIS routing software improves return on investment (ROI) and customer service by addressing critical issues such as road status, maintenance and repair.

Use GIS for more efficient

- Asset and pavement management
- Work order management
- Infrastructure evaluations
- Maintenance and repairs
- Construction
- Landscaping
- Striping and sign maintenance

To sum up Urban Sector in the country has come to be recognized as a key development sector that will induce economic growth with its outreach impacting several ancillary sectors as construction, utilities, Cadastre infrastructure etc. particularly in the times of slowdown.

Parallel to the national initiatives the states to have their priorities for urban development who generate their own programmes and policies form their own budgets. Use of spatial technologies for urban management and governance has taken a greater precedence at the state level from their independent initiatives.

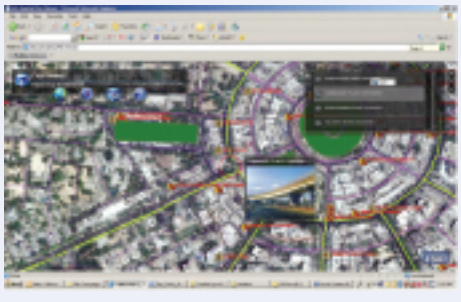
For More Details Contact:
Mr. J Premnath Singh (premnath.singh@niit-tech.com)

Tips & Tricks – APIs made Simple

Building Rich GIS Applications using ArcGIS Flex API

The ArcGIS API for Flex enables you to build dynamic rich Internet applications (RIAs) on top of ArcGIS Server. Create interactive and expressive Web applications leveraging ArcGIS Server resources—such as maps, locators, and geoprocessing models—and Flex components—such as grids, trees, and charts. In order to have a quick Demo on capabilities of ArcGIS Server Flex API, please visit

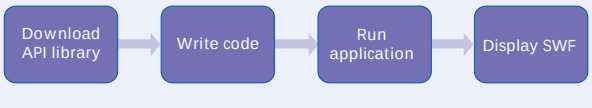
http://mapapps.esri.com/serverdemos/FlexViewer/index.html



The ArcGIS API for Flex provides the following resources for use in your Web applications:

- Maps—The API supports all map projections as well as dynamic and cached (tiled) map services from ArcGIS Server.
- Graphics—Enhance your Web applications by allowing users to draw graphics or providing pop-up windows when users click or hover the mouse.
- Tasks—The API includes classes and methods for common GIS tasks:
- Querying
- Locating addresses
- Finding attributes
- Identifying features
- Geoprocessing
- Access to Flex components—The ArcGIS API for Flex is built on the Adobe Flex framework, which allows the use of rich Flex components such as data grids, trees, panels, and charts. Learn more about the Flex framework on the Adobe Web site (http://www.adobe.com/products/flex/).

To begin working with the ArcGIS API for Flex, follow the steps below:



1.Download and unzip the ArcGIS API for Flex ZIP file using link below :

(http://resources.esri.com/arcgisserver/apis/flex/index.cfm?fa=downloadDisclaimer) Inside, you will find the ArcGIS API for Flex library (.swc), a samples directory, and a readme file.

Be sure to either store the .swc file in the libs folder in your project or specify the library path in Flex Builder. To specify the path in Flex Builder

a. Right-click the project.

b. Click Properties.

c. Click Flex Build Path.

d. Click the Library Path tab.

e. Add the ArcGIS API for Flex Library using the Add SWC button.

2. In your Flex environment, create an application by writing code to access the ArcGIS Server resources. You may also start by exploring the samples (http://resources.esri.com/help/9.3/arcgisserver/apis/flex/samples/index.html).For instance, the following is the source code for accessing a tiled map:

```
<?xml version="1.0" encoding="utf-8"?>
<mx:Application
   xmlns:mx="http://www.adobe.com/2006/mxml"
   xmlns:esri="http://www.esri.com/2008/ags"
   pageTitle="Example #1">
   <esri:Map>
      <esri:ArcGISTiledMapServiceLayer
 url="http://server.arcgisonline.com/ArcGIS/rest/services/ESRI_StreetMap_World_2D/MapServer" />
   </esri:Map>
</mx:Application>
```

3. Compile the code to create your application.

When you compile your application in Adobe Flex Builder 3, a debug version is created. While useful for development purposes, this is not optimal for deployments.

When you are ready to deploy your application, use Adobe's Flex Export Release Build process to create an optimized release-quality version of your SWF file:

1. In Flex Builder 3, click Project > Export Release Build from the main menu.

2. Click Finish.

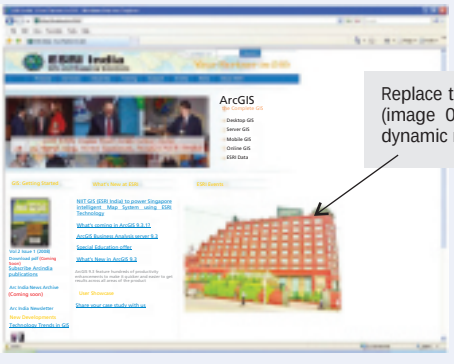
The compiled application (SWF file), its HTML wrapper, and its related files (e.g., shared libraries) can be moved onto any Web server. There are no dependencies on any additional files hosted by you, or ESRI, at runtime because the compiled SWF contains all the necessary code.

Building Mashups using the ArcGIS Javascript API

1. Author a map document (.mxd) using ArcGIS Desktop and apply the geographic coordinate system as WGS 84

Building Mashups using the ArcGIS Javascript API

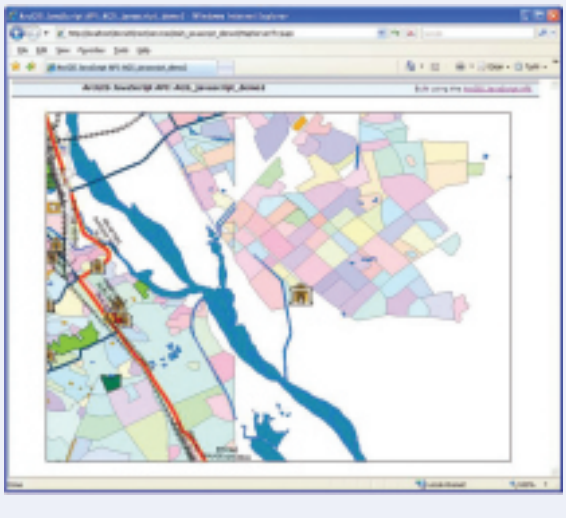
1. Author a map document (.mxd) using ArcGIS Desktop and apply the geographic coordinate system as WGS 84
2. Publish this map document as a map service using ArcGIS Server.
3. Create a map cache using the ArcGIS Online tiling scheme.
4. Now in the next steps , we will replace the static image (see image below) with the dynamic map service



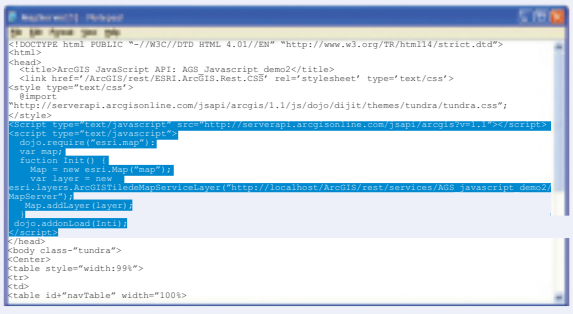
5. Open the web page in the text editor where we need to replace the static image with the dynamic map service
6. Find out the html tag in the code where reference of the static image (e.g.image011.jpg) was mentioned.

```
</td>


     <td class="conference" style="width: 450; height: 450" >

<div id="map" style="width: 450: height: 450">

     <font color="#000080" size="2">

     <p class="msonormal"> :</p>
     <p><img border="0" src="image011.jpg"><br>|

</div>

</td>
 </tr>
</table>
<p align="center">
```

7. Open the ArcGIS Services Directory.
8. Click on the ArcGIS service you have created.
9. Click the ArcGIS JavaScript link under the View In options .We can view our map service in the ArcGIS JavaScript client.

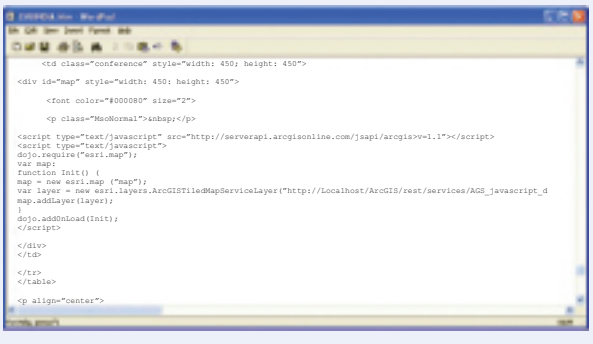


10. We can view the source of the above web page.
11. Copy the following lines from the above page



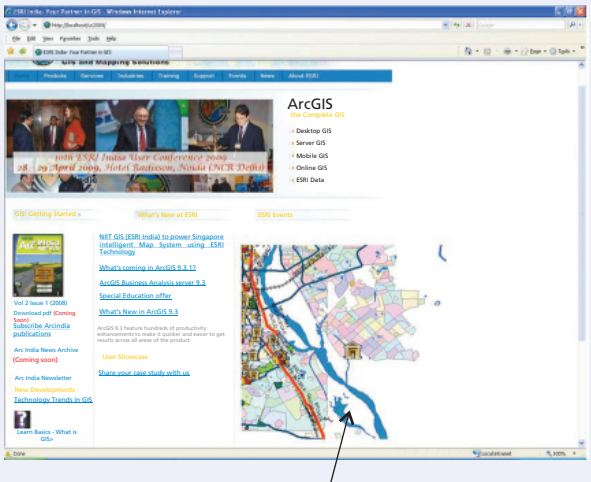
```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html14/strict.dtd">
<html>
<head>
  <title>ArcGIS JavaScript API: AGS_Javascript_demo2</title>
  <link href='/ArcGIS/rest/ESRI.ArcGIS.Rest.CSS' rel='stylesheet' type='text/css'>
<style type="text/css">
  @import
"http://serverapi.arcgisonline.com/jsapi/arcgis/1.1/js/dojo/dijit/themes/tundra/tundra.css";
</style>
<script type="text/javascript" src="http://serverapi.arcgisonline.com/jsapi/arcgis?v=1.1"></script>
<script type="text/javascript">
  dojo.require("esri.map");
  var map;
  function Init() {
    Map = new esri.Map("map");
    var layer = new
esri.layers.ArcGISTiledMapServiceLayer("http://localhost/ArcGIS/rest/services/AGS_javascript_demo2/
MapServer");
    Map.addLayer(layer);
  }
 dojo.addonLoad(Init);
</script>
</head>
<body class="tundra">
<Center>
<table style="width:99%">
<tr>
<td>
<table id="navTable" width="100%>
```

12. Replace these lines in the previous website page at the location where there is a reference for the static image e.g. image011.jpg.



```
     <td class="conference" style="width: 450; height: 450">

<div id="map" style="width: 450: height: 450">

     <font color="#000080" size="2">

     <p class="MsoNormal"> </p>

<script type="text/javascript" src="http://serverapi.arcgisonline.com/jsapi/arcgis?v=1.1"></script>
<script type="text/javascript">
dojo.require("esri.map");
var map;
function Init() {
map = new esri.map ("map");
var layer = new esri.layers.ArcGISTiledMapServiceLayer("http://Localhost/ArcGIS/rest/services/AGS_javascript_d
map.addLayer(layer);
}
dojo.addOnLoad(Init);
</script>

</div>
</td>

</tr>
</table>

<p align="center">
```

13. Save and then refresh the HTML page of the website.
14. Now our static image is replaced by fully functional map in our existing website.



ArcScripts

Function Name: ShowMaptips

Environment: Windows,Adobe Flex MXML & Action Script)

Version: ArcGIS Server 9.3

Description:

The function generates map tips for the underlying features on the mouse over event. Map tips are displayed as a separate callout and are based on the specified attributes. The following libraries are required to be referenced:

```
import com.esri.ags.events.QueryEvent;
import com.esri.ags.Graphic;
import mx.controls.Alert;
import com.esri.ags.tasks.FeatureSet;
import mx.rpc.AsyncResponder;
import com.esri.ags.symbol.Symbol;
import mx.rpc.events.ResultEvent;
import mx.rpc.events.FaultEvent;
import com.esri.ags.symbol.Symbol;
import mx.core.UIComponent;
import mx.managers.CursorManager;
```

Code Snippet :

```
<! - Action Script Code
private function showMapTips():void
 {
queryTask.execute(query,new AsyncResponder(
onResult, onFault);
 CursorManager.setBusyCursor();
      function onResult( featureSet :
      FeatureSet, token : Object = null ) : void
        {
         resultsGrid.visible = true;
         btnClassify.enabled = true;
         lyrSlider.enabled = true;
         var features:Array =
featureSet.features;
 for each (var graphic:Graphic in features)
            {
    graphic.addEventListener(MouseEvent.ROLL_OVER
    , graphicRollOverHandler, false, 0, true);
    graphic.addEventListener(MouseEvent.ROLL_OUT,
    graphicRollOutHandler, false, 0, true);
                // Glow Effect Ends
               graphic.toolTip = "Constituency :
    " + graphic.attributes["UP_PC.PC_NAME"] +
    "\n"
 graphic.attributes.Votes + "\n"
 + "Candidate : " +
graphic.attributes["UP.NAME"] + "\n"
 + "Lead Party : " +
graphic.attributes["UP.Lead_party"] ;
 }
 CursorManager.removeBusyCursor() ;
 graphicsLayer.graphicProvider = features ;
                  }
        function onFault( info : Object, token :
Object = null ) : void
 {
  Alert.show( info.toString() );
 }
        }
 //Functions For Glow Effect private
functiongraphicRollOverHandler(event:MouseEvent)
:void
 {
 glowEffect.play([event.target]);
 }
<! - MXML Code
<!-- Glow effect -->
        <mx:Glow id="glowEffect"
 alphaFrom="0.9" alphaTo="0.5"
 blurXFrom="0.0" blurXTo="50.0"
 blurYFrom="0.0" blurYTo="50.0"
 color="0x0000FF" inner="true" />
<!-- Glow effect ends.-->
```

Function Name: DisplayMapOnMobile

Environment: Windows

Version: Visual studio 2008, windows pocket pc 5.0, ArcGIS Mobile 9.3

Description:

This function describes how to display a map (published as mapservice having mobile data access capability with ArcgisServer 9.3) on windows pocket pc 5.0 device emulator.

```
using System;
using ESRI.ArcGIS.Mobile;
using ESRI.ArcGIS.Mobile.Geometries;
using ESRI.ArcGIS.Mobile.MobileServices;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Text;
using System.Windows.Forms;
using System.Threading;
```

Code Snippet:

```
Code Snippet:
private void DisplayMapOnMobile ()
   {
     try
       {
          //Specify the path of mapChache
            mobileService1.CacheStoragePath =
@"\My Documents\MapCache5";
          //set the URL property of mobile
service
mobileService1.Url = @"http://2273-a43-
gis/ArcGIS/services/MobileTest/MapServer/MobileS
erver";
          //Create the mapchache if it doesnot
exist else overwrite the same

mobileService1.Open(CacheOpenMode.Create );

mobileService1.GetDataAsync(map1, true, null);

             }
            catch (Exception ex)
            {
           MessageBox.Show("Cannot open map
cache: " + ex.ToString());

            }

        }
```

GIST IN HIGHER EDUCATION: THE KUMAUN UNIVERSITY INTERVENTION

Introduction

Considering the human resource requirements for the application of Geographic Information Science and Technology (GIST) in government, industry, business, surveying, natural and human resources planning/implementation/monitoring/evaluation, communication and academic sectors, the Kumaun University has launched a professional course on Master's Degree in Geographic Information Science and Technology (MGIST) since the academic year 2008-09 in which 29 students of 6 different States (i.e.,Uttarakhand, Bihar, New Delhi, Himanchal Pradesh, Assam and Haryana) of our country are presently enrolled in MGIST Part-I class.Two years MGIST programme initiated by the Kumaun University through its newly established Centre of Excellence (COE) for Natural Resources Data Management System (NRDMS) in Uttarakhand (India) is the latest form of the oldest education programme , viz., Mapping Awareness (MA) started in 1991 by David R. Green (2001) in U.K which subsequently became Mapping Awareness and GIS in Europe on GIS in Education.

Coe for Nedms in Uttarakhand

Genesis To develop GIS as per needs of the stakeholders of local level planning, a district level Natural Resources Data Management System (NRDMS) Centre at Almora was setup in 2003 in the Department of Geography, Kumaun University SSJ Campus Almora under the financial and technical support of the NRDMS Division of Department of Science and Technology Government of India (DST GOI).Over the years, the Centre developed GIS infrastructure for different sectors as per needs of the stakeholders of local level planning and trained a number of scientists, government officials, line department officials and civil society organizations through its research programmes on i) empowering youth through geo-informtics, ii) upgradation and applications of NRDMS technologies, and iii) development of geo-hydrometeorological database for the stakeholders of local level planning funded the NRDMS Division DST GOI. Based on the outputs of this Centre, the Department of Geography was recognized by the DST GOI and established a well equipped GIS/RS laboratory under its FIST Programme in 2005. In 2008, the NRDMS Centre Almora was upgraded as the Centre of Excellence for NRDMS in Uttarakhand by the Kumaun University. The vision, objectives, GIS/RS Laboratory Infrastructure, and ongoing research and education programmes of the Centre are as follows.

The Vision

To build professional education and applied research compatibility in Geographic Information Science and Technology (GIST) for various stakeholders, viz., academia, governance, industry and civil society with special reference to the Uttarakhand State.

Objectives

- To conduct Master's Degree, PG Diploma and Ph.D. Programmes, and Certificate Courses on Geographic-Information Science Technology (GIST).
- Need based capacity building of various stakeholders in Geographic Information Science and Technology (GIST).

GIS/RS Laboratory Infrastructure

The Centre has well equipped GIS/RS laboratory consisting of the following major hardware/software, RS data and GIS Modules. Hardware- Server-2 , Workstations with LAN-20 , Pam Tops or Personal Digital Assistant (PDA)- 3, GPS-3, Plotter A0 size.-1, Scanner A0 size -1, Printer A3 size-2, Lazier Printer -1, LCD Projector with motorized screen.-2, Laptop-2, UPS: 4KVA with one hour backup-1, UPS: 5KVA with one hour backup-1. Fax Machine, Internet, Internet Data Card (wireless).

Software- ArcInfo, Arc GIS, Arc Pad, Geomatica Prime 9 , Map Source (Digital Atlas of the World), GRAM++., Vec Viewer, Oracle 9i, Oracle 10g Spatial, ERDAS, XML Spy, GML (Geographic Marked Language) Viewer, Net Beans, DEGREE.

Remote Sensing Data – LISS-III, LISS-III PAN merged, CARTOSAT -1, QUICKBIRD

GIS Modules Developed by the Centre-GIS of District Road Networks, GIS of Streams and Rivers, GIS of District Health Centres, GIS of District Education Centres, Village GIS for Disaster Management, Election GIS, District GIS, Tehsil GIS, Block GIS (all at 1:50000 scale), Village GIS, Household GIS (at 1:2000 scale), Plot GIS (at Cadastral scale), Watershed GIS (at 1:12500 scale), Web GIS, Geo-Informatics, Hydro-Informatics, Weather-Informatics, Biodiversity-Informatics.

On Going Research Programmes

Currently, the with help of its research group constituted of the Scientists, Senior Research Fellows, Junior Research Fellows and Technical Assistants, the Centre is implementing the following GI Science and Technology (GIST) research programmes funded by the DST GOI:

1. Upgradation and application of Natural Resources Data Management System (NRDMS) Technologies in District Almora.
2. Empowering youth through Geo-Informatics for Planning and Local Area Development (EGIPLAD)
3. Development of geo-hydrometeorological database management system (DBMS) for a lesser Himalayan representative watershed.

Master's degree in Geographic Information Science and Technology (MGIST)

Programme Structure – The MGIST is a four semester study programme spread over two years aims at imparting state-of-art knowledge in Geographic Information Science and Technology to meet the emerging demands of geospatial knowledge in different sectors of development.

Eligibility - Candidates should not have less then 45% marks in aggregate at the graduate examination in Science/ Engineering/Social Science stream. Preferences will be given to those students having Geography, Geology, Botany and Forestry at Graduate level, and Certificates of GIS/RS/GPS training/work experience.

Selection Procedure -Selection of candidate is done by merit/written test/oral test.

Total Numbers of Seats - 30

Some Glimpses of Centre's Activities

Data Capturing by Palm Top


Hands on Training in Lab

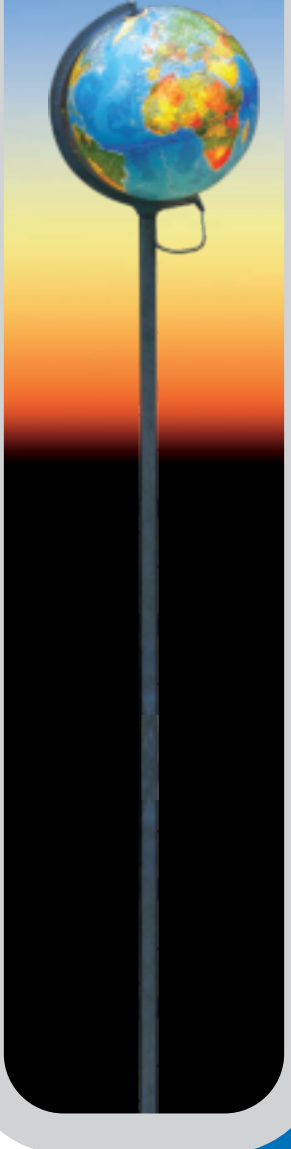

Training Workshop


Training in Field

Dr. J.S.Rawat, Director, Centre of Excellence for NRDMS in Uttarakhand & Professor in Geography, Kumaun University, SSJ Campus Almora-263601, Uttarakhand (India), nrdms_Almora@yahoo.com, jiwan_rawat@yahoo.co.in

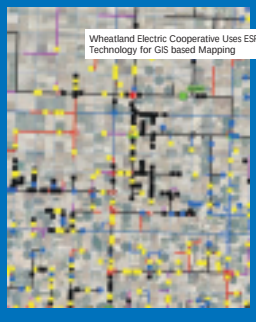
ESRI

Global Page



Small Utilities Improve Network Mapping with Affordable Access to GIS

City of Wauchula, Wheatland Electric Cooperative, and Central Alabama Electric Cooperative Join ESRI's Small Utility Enterprise License Agreement Program


Wheatland Electric Cooperative Uses ESRI Technology for GIS based Mapping

Three utilities recently joined ESRI's Small Utility Enterprise License Agreement (SU-ELA) program with plans to expand the use of geographic information system (GIS) technology. Wheatland Electric Cooperative in Kansas, the City of Wauchula in Florida, and Central Alabama Electric Cooperative are now working to increase the accuracy of network data with GIS-based digital mapping capabilities for desktop, server, and mobile devices.

ESRI designed the SU-ELA program to make GIS more affordable for small utilities in the United States with 100,000 meters/connections or fewer. Through the SU-ELA program, utilities are assured unlimited deployments of ESRI's ArcGIS platform over a three-year term. Additional program benefits include maintenance and support for products, staff training, and passes to the ESRI International User Conference.

Mark Dinkel, GIS administrator for Wheatland Electric Cooperative, said, "During the last ice storm, our crews were able to use GIS-based maps to highlight areas with poles down. They could look up construction material, order it, and have it delivered right on-site. The use of GIS significantly improved our response time during that storm. Expanded mobile GIS technology through the SU-ELA program makes it easier for our crews to locate the problem and create an outage report."

John Gibney, network administrator for the City of Wauchula, commented, "With the use of GIS, we have been able to create an accurate pole count and an up-to-date land base map to help with maintenance, customer service, and joint use tracking. The SU-ELA program also enables us to expand GIS into our water and sewer operations."

Mack Wainwright, GIS supervisor for Central Alabama Electric Cooperative, said, "We are using GIS to maintain a digital inventory and visual representation of our equipment. With unlimited deployments of ESRI software, our crews are able to make updates in the field. From a financial standpoint, the ELA saves us money over three years. Plus, we can take advantage of the additional support and training from ESRI."

At the heart of the SU-ELA program is ESRI's ArcGIS software, an open, scalable, and interoperable platform that provides a complete system to create, serve, and use geographic information. An enterprise GIS based on ArcGIS technology benefits designers, analysts, decision makers, field staff, and customers through mobile, Web server, and desktop applications.

Young Explorers Study an Unmapped Region of the Himalayas - Students Scale New Heights with GIS

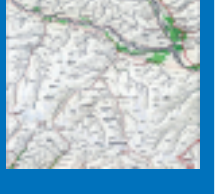
Thirty-eight British students have named mountains for a new mountaineering and trekking guide for the remote and semidesert Ladakh region of the Himalayas. Ladakh is regarded as the "land of high passes." It is a region in the Indian state of Jammu and Kashmir between the Kunlun mountain range in the north and the main Great Himalayas to the south. The highlights of this expedition was to use GIS was used to enter distribution data in the field. These young explorers used ArcGIS to identify and analyze the distribution of plant species in the Thanglasgo Valley. The mountaineering & tracking guide of Ladak used by these young explorers contains maps generated by ArcGIS.

Computer-based mapping of this remote region using GIS in the field underpinned the core purpose of a challenging monthlong research expedition organized by the British Schools Exploring Society (BSES) in July–August 2008 for British students aged 16–20. Maps of the Ladakh region had previously been unavailable.

BSES is a nonprofit United Kingdom-based charity, established at the Royal Geographical Society in London, which has been providing opportunities since 1932 for young people to take part in adventurous expeditions that involve environmental science research in wilderness areas.

Aims of the Ladakh Expedition

Creating and interpreting mapping and geospatial data supported the expedition's two aims—scientific outputs and adventure activities. The Young Explorers (YEs) were able to combine the excitement of climbing in an unmapped region of Ladakh while researching their environment and analyzing findings on digital maps in GIS. The Hundar peak, for example, has no previously recorded ascents and was summited by the BSES team in August 2008. The students ran ArcGIS Desktop software on laptops provided by ESRI (UK) Ltd., ESRI's distributor in the UK, to log and analyze geographic data.



The region had been uncharted territory until the students used GIS.

Matt Bridgestock, BSES Ladakh expedition leader, says, "The main Thanglasgo Valley in Ladakh has become well known to hikers, but the area beyond it had been uncharted territory until the students used GIS. One of the peaks in the northern valley and two in the southern valley had never been ascended before the group arrived. The students were able to plot mountains on maps and name them. Everyone had a fantastic time on what was a dream expedition."

Botanical Projects

The Young Explorers' Palzampiu Valley base camp.

As part of the expedition, the students also engaged in science and botanical projects using ArcGIS to identify and analyze the distribution of plant species in the Thanglasgo Valley and side valleys. No one has ever recorded plant species in these valleys, so the YEs initiated a species list for the region and sampled the vegetation at 200-meter intervals between 4,200 meters and 5,200 meters (approximately 14,000–17,000 feet).

GIS was used to enter distribution data in the field and will be built on to show graphs of plant distribution. This will provide a baseline measure for recording the response of these species to climate change. As global temperatures increase, it has been predicted that plant species in mountainous areas will shift their altitudinal ranges upward.

For more information Visit http://www.bses.org.uk