esri India

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GIS transforming our world

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The 14th Esri India User Conference with the theme "GIS: Transforming Our World" was held in New Delhi on 11th & 12th December, 2013. It was attended by more than 800 professionals and that made it the largest ever gathering of ArcGIS users in the country. I would like to thank our users, partners and sponsors for their contributions and making this event a grand success.

GIS is transforming into Web GIS and that is triggering a change in the way we use GIS and interact with maps. Web GIS is the best way for GIS professionals to share their ArcGIS work with non-GIS users who use consumer devices like smart phones and tablets. Web GIS is a new medium for delivering GIS capabilities and is at the center of Esri's strategic direction for implementing GIS as a platform. Maps on the web provide a new paradigm for how people everywhere access and use geographic information. They use GIS maps on their desktops, the web, on tablets, and smart phones for a sophisticated range of activities to apply advanced geographic information.

Web GIS reduces the need to create custom applications. The wide variety of ready to use applications and application templates included with Web GIS let you tailor simple and to the point user experiences to let people get the job done quickly and intuitively. It makes the integration of GIS with other business systems much easier. Web GIS enables cross organizational collaboration, facilitating communication and optimizing the use of information throughout organizations by creating a participatory environment.

Location Analytics, enabled by Web GIS is also transforming the way organizations can utilize the data they already have. Location analytics combines geographic data on assets, infrastructure, transportation, and the environment with data on an organization's operations and customers to discover powerful answers to any business challenge and share those insights with the rest of the organization. Organizations create, manage, and analyze vast quantities of data in business systems they use every day. Information about location is pervasive in this data. Customers and constituents have a location. Assets, whether fixed or mobile, have locations, as do staff members and suppliers. With the ubiquitous use of mobile devices and social media, location data is becoming even more pervasive. By using the location data in business systems, organizations can make the most informed decisions and create the best business outcomes.

In this issue, we bring to you some articles and stories about how GIS is transforming the world. I hope you find these interesting !!

Agendra Kumar

INSIDE

Designed by:

Creative Bowl

Esri India partners with MapmyIndia to offer a Comprehensive GIS Platform in India

Esri India (a joint venture between NIIT Technologies Limited, and Esri Inc.), country's leading Geographic Information System (GIS) Software & Solutions provider announced a strategic partnership with MapmyIndia, India's leader in quality digital map data, Navigation, Tracking, Location Based Services, and GIS based applications. As a part of the partnership both the Companies will collaborate to offer cutting edge GIS solutions along with rich map data to enterprise and Government customers. Commenting on this strategic partnership, Agendra Kumar, President, Esri India, said, "Earlier Government sector and industries like Retail, FMCG, Banking and Insurance, were not able to fully leverage the benefits of GIS due to lack of data. This partnership combines technology with content which opens up endless possibilities to drive value across all these segments."

This new and powerful platform is custom made for the Indian environment. MapmyIndia maps will now be available through Esri's ArcGIS Online (AGOL), a cloud based GIS platform that can be readily adopted as the mapping platform of choice by organizations. As part of this association MapmyIndia will also become an authorized value added reseller for Esri's GIS Software products which will be bundled with MapmyIndia Maps.

Rakesh Verma, Managing Director, MapmyIndia said, "Our collaboration with Esri India is not just a win-win situation for us but also for the users which includes corporates, Governments and individuals. This powerful platform will equip them with GIS capabilities and comprehensive map data thereby increasing efficiency and productivity. I see this alliance blending India's best maps and world's best GIS technology, as having a strong enabling impact on the way and the scale of GIS usage in India."

Businesses and Government users will now be able to better leverage the Maps provided by MapmyIndia for the Indian geography through AGOL platform. This will enable quicker development and deployment of GIS and location based applications thereby helping organizations in better governance and decision-making.

Esri Launches Public Beta of Geotrigger Service

Esri launched the public beta version of its cloud-based Geotrigger Service that helps developers easily create location-aware apps for iPhone and Android without compromising battery life. The Geotrigger Service allows apps built on the Esri location platform to quickly gather business intelligence such as where people are and when the app is used. Developers can also design apps that send messages to users when they arrive at or leave areas defined by a geofence.

The Esri location platform offers a host of services for developers from geocoding and geoenrichment to routing maps. The Geotrigger Service boosts this offering with location-awareness and location-based alerts. Developers can use the Geotrigger Service for apps across all industries including:

- Retail and Loyalty: Engage customers with personalized content and deals the moment they enter a store.
- Real Estate: Send messages to prospective home buyers when their search criterion matches a nearby home.
- Energy Management: Use location to automatically manage power consumption at home or in the office.
- Tourism: Bring public attractions to life by informing tourists of interesting locations as they explore a city.
- Public Alerts: Notify citizens about events such as road closures or civic emergencies based on past locations.

Esri Tops on a Reader's Survey 2013 conducted by Geospatial World

Geospatial World magazine recently conducted a reader's

Survey	Esri	Google	Hexagon	Trimble	Digitalglobe	Autodesk	Rolta
Most innovative company	23.05 %	23.05 %	19.3%	15.6%	7.6%	2.7%	2.7%
Company with most competitive pricing	19.94%	21.37%	11.97%	-	7.98%	9.12%	-
Most customer friendly company	21.40 %	26.56 %	14.92%	12.02%	-	5.06%	-
Company with most aggressive and creative leadership	26.01%	25.45%	14.37%	12.2%	-	-	3.4%
Best Company to work for	25.77 %	25.18%	14.05%	12.35%	5.80%	-	-
Company with the best training programme	40.86%	12%	12.57%	8.86%	-	9.14%	-
Company with best global Coverage	23.13%	29.33%	16.89%	11.26%	7%	-	-
Company with best post-sales service/support	25.56%	12.21%	15.12 %	18.05%	-	6.69%	-
Company with the most effective business communication	30.40%	21.31%	11.93%	6.53%	-	7.39%	-
Most transparent company in its business dealings	20.70%	18.10%	16.74%	12.09%	8.38%		

Source: Geospatial World Magazine, January 2014 edition

choice survey among their readers across the globe on how top geospatial companies are perceived by key stakeholders across a broad spectrum of criteria. The survey aims at identifying and understanding the strengths, weaknesses and opportunities in the geospatial technology industry. The survey was taken under following areas and results showed Esri topped almost in all the segments ●

Esri's Location Platform Brings the Power of Place to Microsoft Dynamics CRM

Esri released an enhanced Esri Maps for Microsoft Dynamics CRM where Online and in-store analytics are connected using location-based workflows and collaboration. The software adds new analytical perspectives for retailers across the omni-channel. From a single store to the entire supply-chain, users can collaborate to author and share analytical intelligence on customers, stores, products, markets, and the competition with a wealth of demographic data for 120 countries.

"We believe geography is a powerful way to connect all aspects of retail from store operations and merchandizing to financial planning and e-commerce," said Simon Thompson, director of commercial industry at Esri. "Location analytics helps to identify, explain, and communicate trends and patterns about the places that matter the most so that companies can quickly respond to that insight to deliver the best possible outcome."

Esri Maps adds new location-oriented workflows that uncover hidden trends and patterns with interactive tools, data, and analysis. Now, Microsoft Dynamics CRM users can author maps and interactive infographics from their internal information resources. These interactive visualizations and analytics uncover customer intelligence and operational knowledge. The geographic data and tools can then be shared with anyone via intelligent online maps and apps on Esri's ArcGIS Online.

"Businesses need to be able to make smart choices based on information available," said Tracy Issel, general manager worldwide retail, consumer goods, and hospitality at Microsoft. "Esri Maps adds new tools to our rich, drag-and-drop environment for Dynamics, creating new analytical insights for different roles in the organization and enabling

intuitive visual correlations of data using location."

For more information visit www.esri.com ●

Esri Teams with MarkLogic for Big Data Analysis and Management

Esri collaborates for the integration of its ArcGIS Platform with MarkLogic's Enterprise NoSQL database platform to provide real-time access to highly diverse data sources for the defense and intelligence communities.

"We are excited about the integration of Esri's and MarkLogic's technologies, which will enable government organizations to efficiently and effectively manage complex volumes and varieties of data to achieve mission success," says Jeff Peters, Esri's Director, National Government.

New functionality from the integration of the Esri and MarkLogic technologies includes:

- Use of the ArcGIS mapping APIs to build a web interface for visualizing, querying, and interacting with multi-dimensional data from the NoSQL database.

- This application leverages open APIs from the ArcGIS platform along with ArcGIS basemaps and can be integrated with any type of supported layer.

- Users of the application can immediately display data from the NoSQL database over their area of interest and view feature attributes in popups.

- The integration supports the display of attribute-level data, or microdata, based on NoSQL data structures.

- The ArcGIS API also allows text-based and spatial querying against the data, as well as providing users with the tools to create annotations.

Users in the defense and intelligence communities need solutions that will let them quickly and cost-effectively aggregate, search, and analyze multi-structured and unstructured information from numerous disparate sources. Bringing the MarkLogic Enterprise NoSQL database platform together with Esri's geospatial analytic software will deliver more innovative ways to analyzing data than with traditional relational database technology●

Letters to Editors

Dear Readers,

This section of Letters to Editors has been an important section of Arc India News and your comments/suggestions are valuable to us. We would like to have the opinion and feedback of all our readers with respect to the content being published and how its has been useful to them in day to day GIS advancement. You may also let us know what you expect to see in terms of application and technology in the magazine.

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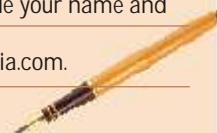
Build Mapping Applications Faster than Ever with ArcGIS 10.2 Runtime

ArcGIS Runtime developers can leverage a variety of Software Development Kits (SDKs) to embed mapping and geospatial applications into existing apps or custom build new ones. ArcGIS Runtime, available from the ArcGIS for Developers site for a variety of platforms including iOS, Android, Java, Mac OS X, Windows Presentation Foundation (WPF), and Qt. Making it easy to create compelling custom applications that integrate geospatial data and GIS capabilities. These SDKs enables you to integrate maps and geoprocessing models to create rich applications.

ArcGIS 10.2 Runtime includes new capabilities to help you stay productive when building and deploying apps. APIs have been improved to simplify the coding model for commonly performed tasks such as geocoding and assigning basemaps, making some of the fastest maps users have ever interacted with. For more accurate display and distance calculations, geometry libraries have been enhanced to support geodesic buffering and geodesic offsets. Apps built with the 10.2 Runtime SDKs also include support for OAuth, which integrates seamlessly with security models built in ArcGIS Online and Portal for ArcGIS.

The new Runtime includes Esri's first-ever SDK releases for Qt and Mac OS X. ArcGIS Runtime SDK for Qt enables the creation of GIS applications that use local services, bypassing the need for an ArcGIS for Server connection. Applications created with the new ArcGIS Runtime SDK for Mac OS X support the Mac OS X Mavericks operating system and can either be installed on any Mac or distributed using the Apple Mac App Store. ArcGIS Runtime SDK for iOS also supports iOS 7.

Also included in the 10.2 Runtime SDKs is a beta version of the offline API. Users can create apps that take data offline, edit their information, and immediately sync changes back to the server. Users can also receive changes that others have synced to the server. Developers will be able to provision devices with the data, basemaps, and editable layers they need to work completely offline.

ArcGIS Runtime SDKs for Desktop Devices

ArcGIS Runtime SDKs lets users access maps and data created with ArcGIS for Desktop, edit geographic features stored in geodatabases, and leverage the power of ArcGIS geoprocessing tools.

What You Can Do With ArcGIS Runtime SDKs:

- Create GIS-enabled small footprint applications that display quickly and deploy easily.

- Select the capabilities you want—from simple map viewing and navigation to powerful spatial analysis.

- Build touch screen applications for laptops, tablets, or in-vehicle mounted systems.

- Develop location-aware applications that use GPS.

- Create applications using local content, online content, or a combination of both.

ArcGIS Runtime SDK for Qt enables developers to build rich GIS applications that take full advantage of the Qt platform

ArcGIS Runtime is supported on the following desktop platforms:

- ArcGIS Runtime SDK for WPF

- ArcGIS Runtime SDK for Java (Linux and Windows)

- ArcGIS Runtime SDK for Qt

- ArcGIS Runtime SDK for OS X

- ArcGIS Runtime SDKs for Windows Store apps

ArcGIS Runtime SDKs for Smartphones and Tablets

ArcGIS Runtime SDKs are also available for building and deploying custom mobile apps. Users can access local data and web services in both connected and disconnected environments, collect and report information, perform GIS analysis, and take advantage of content from ArcGIS Online. Mobile applications can be distributed through various app stores, marketplaces, or private enterprise networks.

ArcGIS Runtime is supported on the following mobile platforms:

- ArcGIS Runtime SDK for iOS

- ArcGIS Runtime SDK for Android

- ArcGIS Runtime SDK for Windows Phone

- ArcGIS Runtime SDK for Windows Mobile

Custom tsunami evacuation zone mobile app built using ArcGIS Runtime SDK for Android.

GIS Tools for Hadoop

Big Data Spatial Analytics for the Hadoop Framework

Looking at data without location, most of the time seems like looking at just part of a story. Including location and geography in analysis reveals patterns and associations that otherwise are missed. As Big Data emerges as a new frontier for analysis, including location in Big Data is becoming significantly important.

Data that includes location, and that is enhanced with geographic information in a structured form, is often referred to as Spatial Data. Doing Analysis on Spatial data requires an understanding of geometry and operations that can be preformed on it. Enabling Hadoop to include spatial data and spatial analysis is the goal of this Esri Open Source effort.

GIS Tools for Hadoop is an open source toolkit intended for Big Spatial Data Analytics. The toolkit provides different libraries:

• Esri Geometry API for Java: A generic geometry library, can be used toextend Hadoop core with vector geometry types and operations, and enables developers to build MapReduce applications for spatial data.

• Spatial Framework for Hadoop: Extends Hive and is based on the Esri Geometry API, to enable Hive Query Language users to leverage a set of analytical functions and geometry types. In addition to some utilities for JSON used in ArcGIS.

• Geoprocessing Tools for Hadoop: Contains a set of ready to use ArcGIS Geoprocessing tools, based on the Esri Geometry API and Spatial Framework for Hadoop. Developers can download the source code of the tools and customize it; they can also create new tools and contribute it to the open source project. Through these tools ArcGIS users can move their spatial data and execute a pre-defined workflow inside Hadoop.

The GIS Tools for Hadoop toolkit allows users, who want to leverage the Hadoop Framework, to do spatial analysis on spatial data; for example:

1. Run Filter and aggregate operations on billions of spatial data records inside Hadoop based on spatial criteria.

2. Define new areas represented as polygons, and run Point in Polygon analysis on billions of spatial data records inside Hadoop.

3. Visualize analysis results on a map with rich styling capabilities, and a rich set of base maps.

4. Integrate your maps in reports, or publish them as map applications online.

Getting started

Developers can get started at Spatial Framework for Hadoop.

ArcGIS users can get started at Geoprocessing Tools for Hadoop.

How it all works?

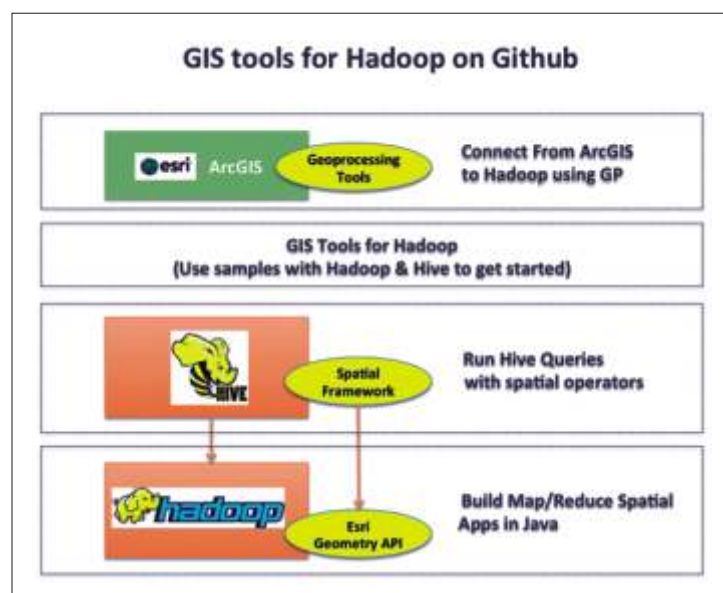Overall there are fourGithub projects that make up the toolkit.

Firstly, the Esri Geometry API for Java: project. This is a generic library that includes geometry objects, spatial operations, and spatial indexing, it can be used to spatially enable Hadoop. By deploying the Esri geometry API library (as a jar) within Hadoop, developers are able to build Map/Reduce applications that are spatially enabled, by leveraging the Esri Geometry API along with the other Hadoop APIs in their application.

Secondly, the Spatial Framework for Hadoop project. This library includes the user defined objects that extend Hive with the capabilities of the Esri Geometry API. By enabling this library in Hive, users are able to construct queries that are very SQL like using HQL. In this case, users don't have to write a Map/Reduce application, they can interact with Hive, write their SQL like queries and get answers directly from Hadoop. Queries in this case can include spatial operations and values.

Thirdly, the Geoprocessing Tools for Hadoop project. These tools are specifically used in ArcGIS. Through the tools, users can connect to Hadoop from ArcGIS. Connecting to Hadoop from ArcGIS is really useful to the toolkit users, since they can import their analysis result in ArcGIS for Visualization. They can also do more complex and sophisticated analysis now that they narrowed down their data to a specific subset. Additionally, users can leverage the ArcGIS platform capabilities to publish their maps to web and mobile apps, and can integrate it with BI reports.

Finally, the GIS Tools for Hadoop project. This project is intended as a place to include multiple samples that leverage the toolkit. The samples can leverage the low level libraries, or the Geoprocessing tools. A couple of samples are available to help you test the deployment of the spatial libraries with Hadoop and Hive, and make sure everything runs with no issues before you start leveraging the setup from your HQL queries, or from the GP tools. To check your deployment, for Hive and GP tools usage, the sample point-in-polygon-aggregation-hive can be utilized. The sample leverages the data and lib directories on the same path.

GIS tools for Hadoop on Github

esri ArcGIS | Geoprocessing Tools — Connect From ArcGIS to Hadoop using GP

GIS Tools for Hadoop (Use samples with Hadoop & Hive to get started)

HIVE | Spatial Framework — Run Hive Queries with spatial operators

hadoop | Esri Geometry API — Build Map/Reduce Spatial Apps in Java

Portal for ArcGIS Server Extension

This ArcGIS for Server extension provides a map-centric collaborative content management system that organizations can deploy in their own infrastructure (on premises on in the cloud). The ArcGIS portal is a central component of the ArcGIS platform, providing the means to easily create, organize, secure, and manage geographic assets within your organization. It connects end-users with useful online GIS applications, maps and geographic data, extending the reach of your geographic information products and ArcGIS beyond GIS experts.

Previously, Portal for ArcGIS was custom implementation. At 10.2, this technology has been turned into a standard product that can be easily set up by any user, immediately integrating ArcGIS server technology and providing complete geospatial content management for organizations.

This technology provides a front end for ArcGIS for Server with dozens of easy-to-use apps and full integration with ArcGIS for Desktop. It also provides an open mapping and analysis platform integrated with standard enterprise IT infrastructure, including e-mail, search, business intelligence systems, SharePoint, and Office. It is accessible from any device platform or web client.

Why Use Portal for ArcGIS?

Portal for ArcGIS gives your organization a platform for managing all of its geospatial content. It enables secure and private sharing within the organization and leverages mobile, server, and desktop clients. It is ideal if you have high confidential and proprietary data, conduct confidential research, or have regulated data restrictions.

With Portal for ArcGIS you can

- Manage your organization's geospatial content
- Access a set of common basemaps, tools, and web services
- Create maps and apps
- Share maps and apps with others inside or outside the organization
- Register your existing ArcGIS services
- Form groups to collaborate on projects or common activities
- Extend the reach of your geospatial information products in your organization
- Promote collaboration of graphic data content in your organization ●

Collect, Monitor, and Analyze Rapidly Changing Data with Enhanced Esri Apps

New Versions of Esri's Collector for ArcGIS and Operations Dashboard for ArcGIS Offer Tablet Support and Improved Data Management

Collector for ArcGIS

Collector for ArcGIS is a configurable field data collection app for iOS and Android. The new version of Collector includes support for iPad and Android tablets. Templates, selection results, directions, and more, can now be viewed alongside the map on mobile devices with larger screen real estate.

The updated Collector app also expands the types of data that can be collected. It now allows the input of GIS features of all primary shape types (e.g., points, lines, and polygons). The app also gives you the ability to view and control GPS accuracy when capturing features so you can stream positions from the GPS as you move.

Data capture often involves recording repetitive information at different locations and/or multiple features of different types at the same location. To reduce that manual repetition, Esri introduced a continuous collect mode that allows you to copy the location or attributes of the last collected feature.

Features: Create and share a collector map

Extend the reach of ArcGIS into the field and improve the accuracy and currency of your spatial data. Create and share collector maps in 4 easy steps:

At version 10.2, Collector for ArcGIS includes an updated user interface, improved data management, and support for iPads And Android tablets

1. Create a collector map

2. Configure the data collection form

3. Publish and share your map

Collect data

Finding places of interest, calculating distance, creating

service requests, and reporting damage, are just a few of the capabilities of a collector map. Create intelligent data, with images and video, and share it with the world in 5 easy steps:

1. Open the collector map

2. Create new features

3. Provide details

4. Add a photo

5. Save and share your changes

Operations Dashboard for ArcGIS

Operations Dashboard for ArcGIS provides a common operational picture for monitoring, tracking, and reporting events to people within your organization. The new version of Operations Dashboard improves the way you work with data. Because you can potentially use Operations Dashboard to view extensive lists of information, Esri added the ability to search within lists to quickly find what you need. You can now see charts, graphs, custom text, and photo attachments within the pop-up windows. You can also filter the map and all widgets using relative time, such as within the last hour or month, or after a specific date. This helps you monitor and analyze data that changes rapidly over time.

Operations Dashboard for ArcGIS now fully supports Portal for ArcGIS as well as ArcGIS Online. A new configuration utility is available to Portal customers, making it easy to sign in and deploy the Operations Dashboard app on-premises ●

ArcGIS GeoEvent Processor for Server

This extension allows you to connect with virtually any type of streaming data and automatically alert personnel when specified conditions occur—all in real time. GeoEvent Processor changes your everyday geographic information system (GIS) applications into frontline decision applications, helping you respond faster and with remarkable accuracy whenever and wherever change happens.

With this extension, you can

• Connect to Any Sensor—GeoEvent Processor includes connectors for common sensors including in-vehicle GPS devices, mobile devices, and social media providers. Additional connectors can be found online, enabling you to handle the types of sensors you use.

• Process and Filter Real-Time Data—With GeoEvent Processor, you can accommodate multiple streams of data flowing continuously through filters and processing steps (that you define), allowing you to detect and focus on the most important events, locations, and thresholds for your operations without interruption.

• Monitor Assets, Update Maps, and Alert Key Personnel—GeoEvent Processor makes it possible to track all of your most valuable assets on a map, whether they are dynamic assets that are changing location, such as vehicles, aircraft or vessels, or stationary assets built into your physical networks and infrastructure. When locations change or critical thresholds are met, GeoEvent Processor can automatically and simultaneously send alerts to key personnel, update the map, and append the database, as well

as interoperate with other enterprise systems.

Why Use GeoEvent Processor?

GeoEvent Processor gives you the ability to incorporate real-time information streams with existing GIS data, enterprise databases and applications, including the ArcGIS platform.

You can

• Connect sensors to map features hosted on ArcGIS Online or ArcGIS for Server so they represent the most up-to-date information happening in the real world.

• View feature status using any ArcGIS viewer, such as Operations Dashboard for ArcGIS.

• Enrich the data from incoming events with additional fields joined in from a feature service.

• Use existing features as geofence events. You can even create geofences on-the-fly without interrupting the stream.

• Filter streams using spatial and/or attribute conditions to view only the most important features.

• Store historical events using feature services.

Developers can create new connectors using the GeoEvent Processor Software Development Kit (SDK).

Requirements

GeoEvent Processor is an optional extension for ArcGIS for Server Standard and Advanced editions●

GIS Transforming our World

By Jack Dangermond

The theme of Esri International User conference 2013 was "GIS: Transforming Our World." The word transformation can refer to two types of change: physical change, as well as change in how we perceive things. GIS is relevant to both.

The work of GIS professionals is creating many information products that are directly changing our physical world. Their work also changes how we see, understand, and interact with our world.

Today, our world is facing serious challenges on many fronts. It's becoming clear that we need to collectively work to create a better future. This means leveraging our very best design

talent, as well as our best technology and science, to create a more sustainable future. GIS provides the platform for doing this.

The Power of GIS

GIS is already changing how we think and how we act. It is built on the science of geography and, as such, it provides an integrative and comprehensive framework that cuts across many disciplines and organizations. GIS also has the power of qualitative analytics blended with easy-to-comprehend
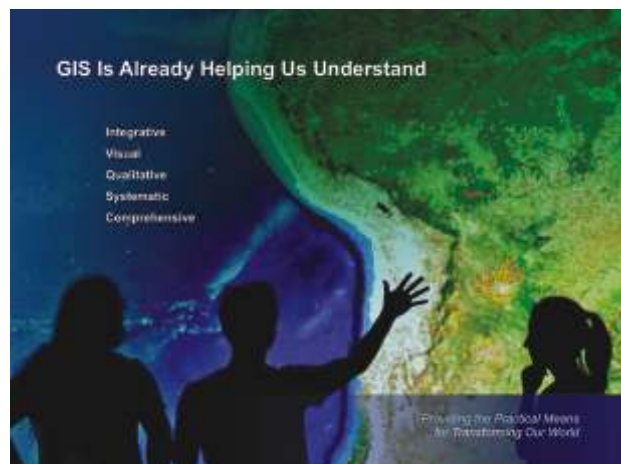
geospatial visualization.

By integrating geographic science into everything we do, GIS is improving how we measure and analyze things, as well as how we predict the future. It is also providing better ways to plan, design, and make decisions. The success of the GIS community is creating tens of thousands of important systems around the world and providing evidence of the huge contributions our field is making.

For all these reasons, GIS is a promising technology for addressing issues at a larger scale—a global scale—in the world. To do this, we clearly need to also dramatically scale up its application and make it pervasive.

Scaling Up

By scaling up, I mean that we need to dramatically grow the application of GIS, leveraging the current community of users. We need to make it pervasive throughout organizations and across society.

Is this possible? My sense, as well as personal experience with other pervasive technologies such as the Internet and GPS, is that this scaling up is both possible and in some ways

inevitable. GPS, for example, has been radically simplified, and this in turn has rapidly transformed human beings' sense of place. Together with consumer web mapping, we can now see both our whole planet and where we are at any time.

GIS will become pervasive in the same way, leveraging the connectivity of the web and cloud computing. The result will be better decisions that reflect better understanding and ultimately a more sustainable future.

GIS -> Web GIS

This next step in the evolution of GIS involves a new technology pattern—web GIS. With release 10.2 of ArcGIS is a complete web GIS, not just mapping. It integrates Esri's and other geospatial technology (i.e., using strong engineering and open standards). This platform takes advantage of the latest trends, including web and cloud technologies, big data, faster machines, and pervasive devices. Web GIS also directly models and integrates all the geospatial data types—remote sensing, GPS, the sensor web, 3D data, crowdsourcing data, real-time data, and pervasive web content.

The emerging platform is easy to use, more open, accessible, and collaborative. It uses focused apps for making maps, doing analytics, and accessing a rich, living library of shared maps and geographic data.

Web GIS Integrates Any Data

One of the key concepts of web GIS is how it organizes content. Web GIS models all types of information as web maps and web services. These web maps can represent typical geospatial data types—maps and imagery, as well as tabular data, such as geodatabases, spreadsheets, and enterprise databases. It also integrates social media and sensor networks with real-time information and the whole world of big data.

GIS is all about integration of data. Web GIS also provides new

patterns for involving information sharing and collaboration, web maps and services, and visually and analytically combining geospatial data.

Another intriguing aspect of web GIS is that it can help break down the fundamental barriers that separate organizations. Whether the silos are professional or organizational, the ability of the web GIS environment to fluidly integrate different disciplines and activities gives us a new framework for collaboration.

Web GIS has one other interesting ingredient: it can help us easily organize our work. It provides content management capabilities for all your maps, apps, and models and also simplifies sharing these within a group or across departments and organizations.

Driving the Transformation

While web GIS is just starting, it is already proving to be an attractive platform that is helping us to scale up and leverage the work and knowledge of GIS professionals.

For GIS professionals, understanding this pattern and its underlying technology is important. Embracing these patterns will both leverage existing investments and drive geospatial adoption across organizations. Ultimately, this pattern promises to make huge contributions to our understanding of the world around us.

When you put all this together, you begin to realize that we have a huge opportunity to amplify the power of GIS. GIS professionals are essential to making this happen. In my mind, there has never been a more exciting time to be a GIS professional. As Esri continues to grow and evolve, you constantly remind us to stay focused on what is important: our mission of advancing GIS and supporting our users. Your efforts are having a large impact on our world. Thank you for letting us help you make a difference ●

India-WRIS WebGIS: Design and Development of Web Enabled Water Resources Information System of India

Introduction

In the emerging era of wide spread use of IT tools, up-to-date information on water resources is the key to support economic development, conserve the nature as well as to improve the quality of life. Due to rapid rise in population and food demand, growing economy and improving living standards; the pressure on our water resources is increasing and it will become scarce in the coming decades if not managed at this stage in integrated way. Water resources management requires a multi-disciplinary approach that combines a collection of technical tools and expertise along with stakeholders of diverse interests and priorities in planning and management and an operational water resources information system at national level is the first requirement.

With the emerging knowledge society and wide spread use to Information Technology, up-to-date information on water resources is vital to support economic development, improve the quality of life as well as to conserve the nature and the environment and hence; an operational water resources information system at national level is essential for planning and development of the country. Looking at this CWC and ISRO are jointly executing since January 2009; the project 'Generation of database and implementation of web enabled water resources information system of India' short named as India-WRIS WebGIS.

Single Window' solution of all water resources & related data and information in a standardized GIS format to all concerned departments, organizations and stakeholders. The thin client scalable web enabled information system provides comprehensive, authoritative and consistent data of India's water resources along with allied natural resources data & information, web enabled tools to search, access, visualize, understand, look into context and study the spatial patterns. Based on the requirements and data availability, comprehensive information have been collected, thought fully categorized and arranged in GIS environment under 12 major and 30 sub information systems besides base sub information system having large number of attributes data of last 5 – 50 years. India-WRIS Web GIS has been designed using latest web 2.0 technologies which provide various GIS tools in a rich GUI assisted format for easy access and use.

The current version 3.0 of the WebGIS portal is designed and developed keeping in view multi- users from all sections of society, varied and multi-source data input, current map policy, requirement of regular updates and near real time data accessibility, data security domains, scale of information and level of access of the portal as well as download of different GIS maps, data and value added products along with tool kit for further analysis and value addition.

The information system has four key elements besides other facilities namely:

(1) Data input/entry/collection system

(2) Data storage, analysis, and transformation into 'user friendly' information

(3) Interactive system for geo-visualization and temporal analysis and

(4) Information dissemination system in public domain as downloads and further processing tools

Water information in Public domain

Dissemination of data in public domain constitute the most important aspects of the water resources management being multi stakeholder's involvement, people's participation and information sharing to increase transparency, public awareness, elevating the importance of water information and enlighten public involvement in water management. The thrust has been towards development of an open source user end web enabled information system. It provides adequate and contemporary information on the state of water resources which are must for planning and water resources management strategy. This, in turn, will ensure increase in public awareness about the crucial issues related with water and attract their participation in management, planning and development of water resources of the nation leading towards the holistic goal of water security.

Water Wealth of India

Water is one of the most important renewable natural resources for supporting life. With the increasing population

of India as well as its all-round development, the utilization of water is also increasing at a fast pace. On an average, India receives annual precipitation (including snowfall) of about 4000 km3. However, there exist considerable spatial and temporal variations in the distribution of rainfall and hence in availability of water in time and space across the country. It is estimated that out of the 4000 km3 water, 1869 km3 is Average annual potential flow in rivers available as water resource. Out of this total available water resource, only 1123 km3 is utilizable (690 km3 from surface water resources and 433 km3 from ground water resources).

Water Resources – India at a Glance

Area of the country as % of World Area : 2.4%

Population as % of World Population   : 17.1%

Water as % of World Water   : 4%

Rank in per capita availability   : 132

Rank in water quality   : 122

- Average annual rainfall 1160 mm (world average 1110 mm)
- Range of distribution 150 -11690 mm
- Range Rainy days 5-150, most rain 15 days in 100 hrs.
- Range PET 1500-3500 mm
- Per capita water availability (2010) in m3-1588

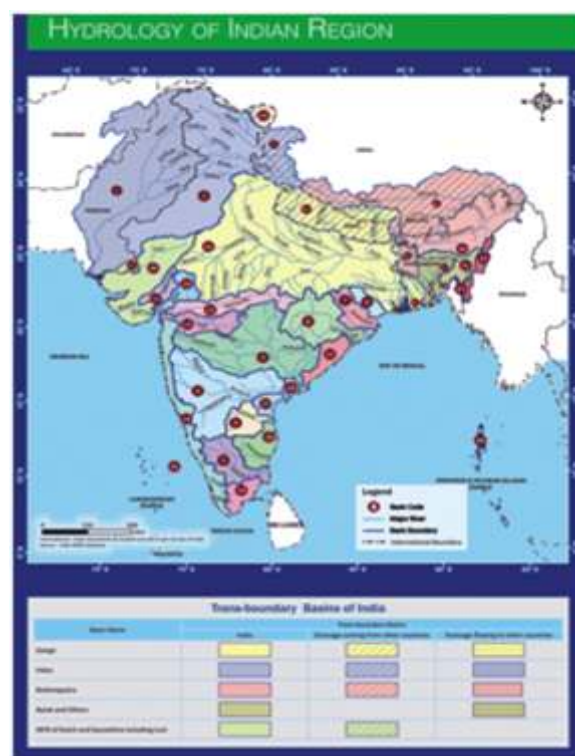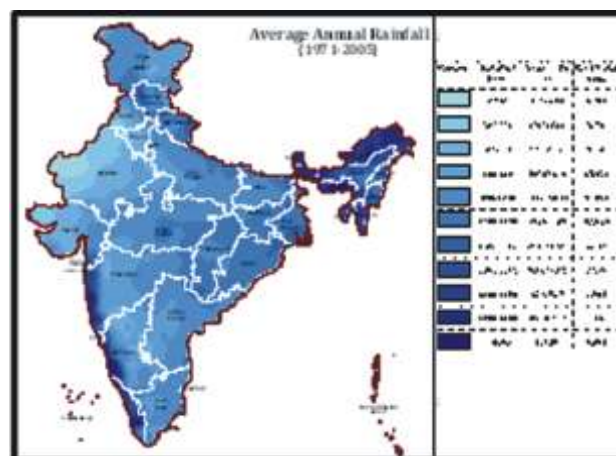| Water Resource at a glance	Quantity - BCM	Percentage
Annual precipitation (Including snowfall)	4000	100
Precipitation during monsoon	3000	75
Evaporation + Soil water	2131	53.3
Average annual potential flow in rivers	1869	46.7
Estimated utilizable water resources	1123	28.1

Source: Water Resources at a Glance 2011, CWC, New Delhi, (http://www.cwc.nic.in)
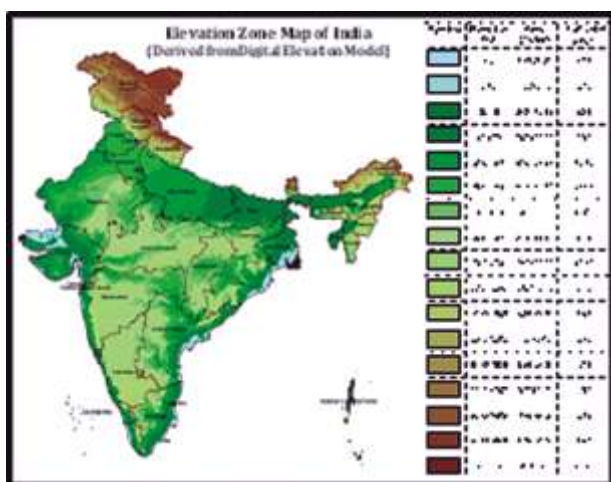
## India-WRIS WebGIS Application Architecture (Technologies & Tools)

The three components India-WRIS Web GIS Application are:

Database Design & Generation: The database for India-WRIS is highly complex with numerous sources involved. Much of the data is spatial in nature but the amount of associated data is very large and also having time series, and will further increase exponentially with the passage of time. The creation and management of such data is a colossal feat in itself and requires state of the art tools. The database standards and relationship have been developed for all type of data. The database generation software used have the capabilities of creating maps, viewing or exploring data, editing data, storing, conflation (integrating datasets from different sources), transforming (into different coordinates systems, different representations, re-sampling, resulting in new representation/format of the same data), querying, analyzing etc.

Web Application &User Interface Technology: The major user requirement from the web portal is data dissemination; hence advance GIS data processing systems at the back end augmented with the best database connectivity over the internet is used so that the user is able to get intuitive and real time information.Using the Flex API, India-WRIS combines GIS based Web services from ArcGIS Server with other Web content, which are displayed in simple, dynamic mapping applications over the Web. All the published map services are compliant with OGC standards and the services can be
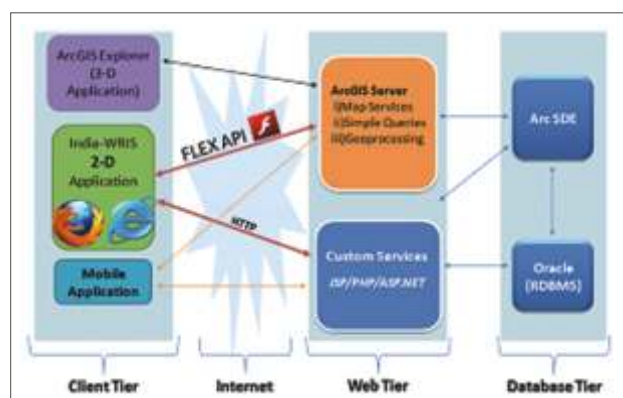
Web Application Architecture

accessed using WMS, WFS, WCS and KML standard formats.ArcSDE as well as oracle together used to handle geospatial data and to createmultiuser geo-database.

Tasks		Software / Technologies
WebGIS Front end	2D	Adobe Flex, HTML, PHP
	3D	ArcExplorer, .NET, ArcGlobe
	Mobile	.NET(Windows) / Flex(Android) / JAVA(Symbian)
	Meta Data	Visual Basic
Data Generation (Digital Image Processing / GIS Mapping)		ArcMap, ArcCatalog, ArcSDE, AutoCAD 3D, IGIS, Map Window Library, GeodatabaseXMLENVI, ERDAS Imagine,
Publishing / Web Geodata Services		ArcGIS Server
Geodatabase /Back end		Oracle 11g, MySQL

Tasks and Software/ Technologies Used for India –WRIS

Database Storage & Hosting: In order to ensure reliable and secure, 24 x 7 availability of the WebGIS, a robust hosting architecture has been designed. The same has been replicated at three places namely, RRSC (West) - Jodhpur, the data generation and s/w development as lead centre; NRSC -
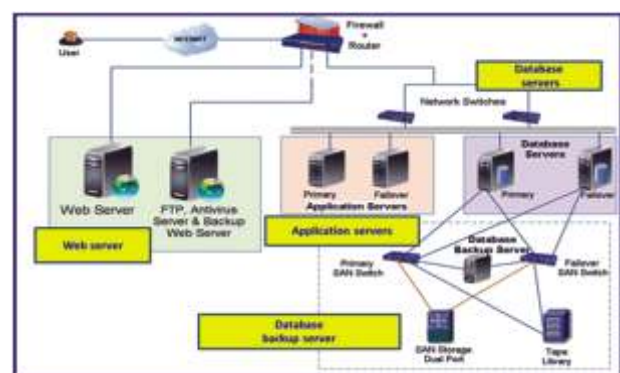
Web hosting architecture

Hyderabad for web hosting and CWC - New Delhi for intranet users and data validation & updation.

Public Outreach and Designing the Interface, Tools and Facilities in India-WRIS WebGIS

Considering large number of factors as; type and volume of data, large number of varied users, ease of handling, varied nature of internet connectivity in the country, information requirement by the users and available technologies; Utmost care has been taken by the WRIS team to design the user interface of the portal. The home page is divided into three sections:

Main Menu Toolbar

The main menu has six modules namely, WRIS Info Discovery, WRIS Explorer, WRIS Connect, Input Data Builder, Share Success Story and Create Your WRIS.This is the heart of India-WRIS information system where all the major links to the various WebGIS modules are provided in a rich Graphical User Interface (GUI) assisted format for easy access and use.

WRIS Info Discovery & Data Catalog -This module provides the user to select area of interest based on the Administrative units, Hydrological units and Constituency wise and is presented with a condensed list of all the information available in India-WRIS for the area.

WRIS Explorer - This is the core module of India-WRIS WebGIS where all the data can be explored and viewed using the various tools available for the purpose.:

Geo-Visualization - This section provides basic facility to visualize all the layers together in any combination by turning layers on and off as per the requirements.

Sub-Information Systems - There are 12 major information systems namely, base data, surface water, ground water, hydro-met, water quality, snow cover/glacier, inland navigation waterways, inter-basin transfer links, hydro-met extremes, land resources, water tourism and socio-economic. These have been further divided into 35 sub-information systems. Each sub-information system is based on a particular theme. It contains relevant layers and specially created tools to make the best use of the data.

Temporal Analyst - A large amount of water resources and related data regarding hydrological, meteorological, pollution etc. are temporal in nature. In order to represent these datasets, a separate module has been created where facilities are provided to represent the time series data using suitable charts, animations and to compare the data across stations or years.

Climate Trend Analysis – The aim of this section is to provide the users with a facility to analyze the changes in climate over the course of past 104 years (1900-2004). This analysis can be performed on various units viz. River Basin, State, District, and Village through various tools such as tabular, statistical and graphical analysis.

WRIS Connect

The sub-modules in WRIS Connect are:

Live Telemetry Data - This system provides real time information such as Water Level, Rainfall, Air Temperature, Wind Speed, Wind Direction and Solar Radiation measured at

466 telemetry stations across the country. Water level data for the past 72 hours is displayed where as the other parameters of the past hour are presented on a dashboard.

Query Interface - User can have lot of queries answered directly through WRIS Explorer and associated available tools. To explore more details, user can place queries through Query Interface that contains set of fixed queries on various hydrological parameters. The answers are generated through different permutations and combinations of these fixed queries. The result of a query is displayed in spatial as well as non-spatial formats.

Report Generation - This section has the utility to automatically generate report of the user defined area / region containing the all data into tables and maps and allows Save As and Download in .pdf format.

Data Download - Apart from viewing the available data, the user may also wish to take the data and perform analysis / add value. This link allows the download of GIS layers and associated attributes.

Automatic Map Generation – This module provides the user with a highly useful facility of generating high-quality, multi layered, theme based maps in GeoPDF format. The latest GeoPDF documents are highly versatile PDF documents that have the features of a mini Geographic Information System complete with tools such as layer visibility toggling and attribute data viewing.

Input Data Builder

This module aims at keeping the data content of the various layers of India-WRIS up to date by providing facilities to the data providing sources to ingest the current attribute data directly into the relevant layers. The authorized users can enter the respective spatial and non-spatial data in the specified format into the information system through this facility. The three sub-modules of Input Data Builder are Spatial, Non-spatial and Metadata Input Builder.

Share Success Story

The objective of this module is to connect people for water resources planning and management by providing platform to upload the success stories so that others can view, interact and practice.

Water Resources Planning & Management

Create Your WRIS - This module provides facilities to the user to have further analysis of the downloaded data, adding new datasets using available general hydrology tools and generate report of the area.
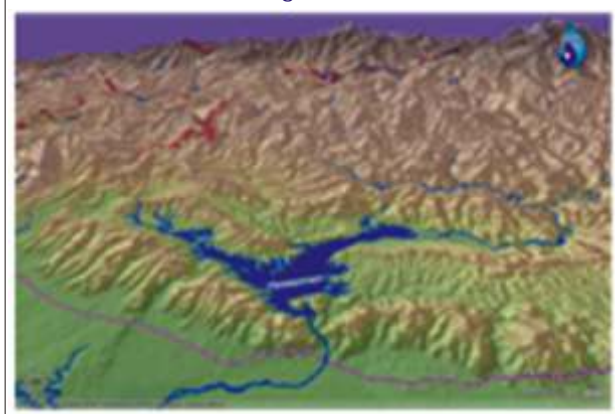
2D-3D Linked View

Linked View with Bhuvan Portal

3D Viewing   RAMGANGA DAM / RESERVOIR

2D-3D Linked View – Through this highly interactive feature, 3D fly-through simulations can be generated along any linear feature like Rivers, Roads or user drawn features. The high resolution satellite imagery make it a very realistic flying experience.

Collaborative Planning – In the water resources sector, need is often felt to share and work collaboratively for understanding and decision making. This tool provides the platform for this purpose wherein the users can share their screen views, drawing & actions while communicating through text and voice messages.

Universal Toolbar

Universal toolbar is present at the top of the home page and has two sections.

First section - The toolbar at the top of the page contains the links to popup window having information required by the user at any point and toolbar is visible at all times. The links in this toolbar are: About WRIS; Accessibility; Tools; Metadata; WRIS Wiki; Help; Search.

Second section - The advanced information toolbar is available right below the banner. It contains links to pages containing detailed information that a user requires when visiting the home page but may not require while exploring the other sections of the information system. The links available in this toolbar are: Home; Publications; Gallery; WRIS Mobile; FAQ; Feedback; Sign In / Register

General Information Toolbar

This toolbar is available in the lower section of the home page and provides links to general information about India-WRIS as Visitor Number, Disclaimer, Sitemap, Links, Contact Us and Last Updated.

Six Categories of Tools

1. Navigation Tools

Zoom In: It zoom into a particular area on map that is selected by the user.

Zoom Out: Is zooms-out the map to come out of the detailing.

Pan: It allows user to Pan around the whole map

Full Extent: It allows viewing the map at the full extent.

Previous Extent: It allows going to previous extent when the map extent is changed.

Next Extent: It allows returning from the previous extent.

Map Overview: Provides location of current view in context with larger map area.

Go To: Zoom to an area based on specified latitude and longitude

Select Area Zoom/Rubber Zoom: Smooth Zooming into a selected area

2. Display Tools

Swipe: It swipe the selected layer in the map to reveal underlying layers

Spotlight: It removes overlaid layer from the selected portion for better visualization

Magnifier: To view the zoom in layer details of selected portion only

Get Feature Info: On selecting a particular feature it displays summary info

Identify: identify the details of all the visible layers including the elevation details of the point

3. Search and Query Tools

Query Builder: create user defined queries

Search by Proximity

4. Personalization Tools

Draw: Allows to draw a shape/line/point on map

Print: To print the current viewing area in landscape or portrait mode.

Save as Image

Bookmark: Allows bookmarking a specific location on the map for future reference.

Pin Mark: User can pin mark his location of interest and type his comment on same

5. Advanced Tools

Surface Profile: Generate the surface terrain height graph of selected points on map

Network Analysis/Route Tool: It specifies the defined route of road, rail and river network.

Tools to calculate parameters based on location and user input.

Linked View: Can View multiple view of different information in a single window.

6. Sharing Tools

Share a Link: Share the current view of map with another user through mail.

iFrame: Sharing frame of India-WRIS in other applications.

Links on twitter/Facebook/Google+

Conclusion

The hydrological processes are continuous as well as somewhat complex and therefore, an updated comprehensive, reliable and easily accessible Information System having time series data of the hydrological and meteorological observations is pre-requisite for effective management of water resources

Integrated Geo-Spatial based Estate Management System (iGEMS)

V.O.Chidambaranar Port Trust implemented iGEMS to manage port estate.

Indian Ports are the backbone of trade and play an important role in the growth of Indian economy since decades.It enables international trade and commerce by providing an interface between the ocean transport and land-based transport. The port uses massive land and water area to establish deep ship channels, berth, good transport network, cargo storage areas, quarters and utility facilities, etc. To meet the future trafficrequirements andincrease the operational efficiency,Indian port sector isimplementing an integrated port information system with modernized IT infrastructure.

V.O. Chidambaranar Port is the second largest port in Tamil Nadu and one of the major ports in India, contributes significant growth in India's Economy. V.O. Chidambaranar Port Trust (VOCPort Trust) had initiated an end-to-end integrated Port Information system (e-SAIL) to improve the core business processes, monitor and enhance service delivery to its customers, increase its operational efficiency, and enhance service delivery to its internal and external customers using integrated system that seamlessly ensures workflow across all port activities. VOCPT chose L&T Infotech as its Information Technology Transformational partner to implement eSail.As part of eSail project, L&T Infotech implemented an Integrated Geospatial based Estate Management System (iGEMS) to manage the port estate by integrating ERP and GIS.

Business drivers

Visualizing the graphical representation of entire Port land and water area, monitoring the land use pattern and availability of vacant land, managing all available landparcels (like storage space, buildings, berth, jetties, warehouses, etc.) and assets effectively to enhance revenue from these was a big challenge for the Port and hence this was identified as the key business objective for iGEMS by Port management.

Major Business drivers of iGEMS solutions are-

• Creation of comprehensive enterprise spatial database for


↑ Major business drivers of iGEMs Solution

the entire port

• Integrating with SAP and Port Applications for real time information

• Establish & optimize landuse pattern

• Unified and real-time storage area availability status

• e-booking option for the vacant storage area

L&T Infotech iGEMS Solution

To address the above business drivers, L&T Infotech designed, developed and implemented a web based iGEMS solution using ESRI technologies. iGEMS solution helps the stakeholdersto capture, store, manage, analyze and visualize all spatial and associated non-spatial information. The solution is integrated with Port applications and SAP to display real-time information to the user.

The iGEMS application includes three sub modules, which addresses core estate management business functionalities of VOCPT. GIS based Estate management: This moduleprovides the detailed information to Estate department usersto
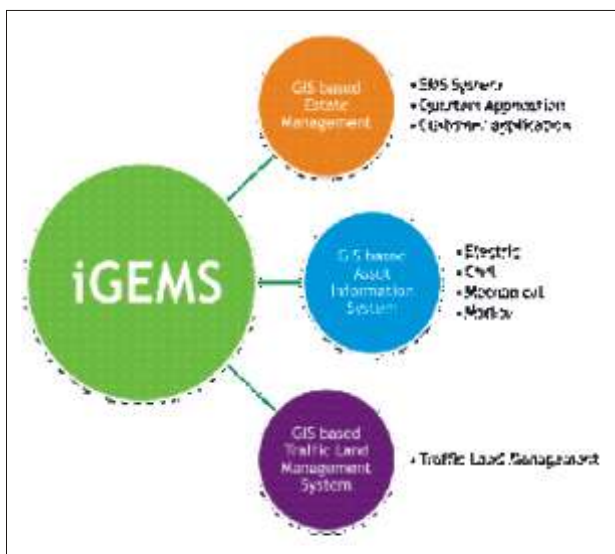
↑ iGEMS application sub modules

manage the estate efficiently andalso VOC Port Customer / Lessees decision making. This module also provides the quarter's availability status to employees,also addresses Quarters allocation needs. This application fully integrates with SAP for business workflows.

GIS Based Asset information: This moduleprovides utility and marine assets and its related non-spatial informationto Mechanical, Electrical, Civil and Marine users. It integrates with SAP Portal.

GIS Based traffic Land Management: This moduleprovidescargo storage area details, land availability status, cargo detailsetc., to Traffic department users. This module is integrated with Port application.

All above three modules in iGEMS include common

functionalities like basic search, advanced search,spatial search,measure, print,and display the status of the asset and land parceletc.,

Salient Features of iGEMS Solution

Key features of iGEMS solution are-

- Customized and comprehensive spatial database forentire port – spatial and Non-spatial data

- Single-window access—An integrated, easy-to-use rich web interface for land and asset information

- GIS-based system tightly integrated with SAP & Port applications to provide single seamless "Integrated Geo-Spatial Solution" for supporting:

- Processes related to lease management covering allotment/occupation/vacation/renewal, demand & collection of rentals, recovery of charges, etc.

- Processes related to allotment of quarters for employees, allotment of land, shops and building on rent/ leases, etc.

- Shared Spatial data infrastructure & Rich graphical representation and visualization of VOC Port's land and water area

- Dynamic and Online Monitoring of all spatial assets with provision to switch on/off multiple layers

- Ease of management of vast estate of land, buildings and other structures leased out to external parties efficiently

Why ESRI technology?

L&T Infotech chose ESRI's ArcGIS technology to address the following needs of VOC Port Trust.

- Enterprise architecture & database support for storing spatial data

- Technology support for tight Integration with SAP system and Java based third party applications

- Rich web Map application API for FLEX, Silverlight and Javascripts

- The ArcGIS platform includes APIs and SDKs for

↑ Salient features for selecting ArcGIS software's for iGEMS Solution

developers, ready-to-use content, and geospatial web services

- To meet the future development requirement of the port Business Benefits of iGEMS Solution L&T Infotech iGEMS solution provides following business benefits to VOC Port Trust:

- Comprehensive enterprise spatial database for the entire port

- Improve operational efficiency through unified, workflow based system for land parcel management

- Sharing spatial information to all departments

- Spatial asset monitoring through display of Port area & assets belonging to Estate, Civil, Electrical, Traffic, Marine departments

- Transparency through uniform information delivery to all lessees and general public

- Geo-spatial Decision Support system for land-use patterns, land availability & demand patterns, rental revenue patterns, etc.,

- Faster Analysis and Decision making through integration with SAP &port Application.

About the Authors

Mr. M. Ganeshmoorthi has Master of Technology in GIS Applications and specializes in GIS applications,especially in Utilities domain. He has worked in different types of GIS projects and has rich experience in various GIS technologies and applications.

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Special Acknowledgements:

We would like to extend our special acknowledgement to the following key stakeholders who were involved in this project under various roles and capacities.

Mr. S. Anantha Chandra Bose, Chairman, VOC Port Trust

Mr. S. Natarajan, Deputy Chairman, VOC Port Trust

Mr. R. Sathishkumar, Sr. Deputy Director, EDP, VOC Port Trust

Mr. Sankar Krishnan, eSail Program Manager, L&T Infotech

Mr. Raja S, eSail SAP Project Manager, L&T Infotech ●

14th Esri India User Conference 2013: GIS – Transforming our World

1 4th Esri India User Conference 2013 saw a gathering of the like minded people of the GIS Community who had come together to share their experiences, best practices, applications, and success stories. The Esri India User Conference offered a wealth of information regarding technology and applications from Esri India, exhibitors and business partners.Three days of technology extravaganza was held from 10 -12 December 2013 at Kempinski Ambience Hotel, Delhi, India. The user conference was organized by Esri India (NIIT GIS Ltd.) and was supported by Digital Globe as a Bronze Sponsor, Geospatial Today, Directions Magazine India & Coordinates as Media Partners and Geospatial World as a Pen Sponsor. The user conference witnessed participation of more than 800 delegates from 70+ organizations.

A day prior to the main user conference i.e. on 10th December, Esri India organized two pre-conference seminars and a Developer's Summit. The two pre-conference seminars were on ArcGIS Online and GIS for Roads & Highways.

Preconference seminar on ArcGIS Online(AGOL) was attended by a wide variety of audiences from different sects of government organizations and academic community. Mr. Satish Sankaran from Esri Inc. along with the Esri India team – Vatsal Dave, Krishna Rao TVB and Abhishek Sindal focused on ArcGIS Platform, Portal of ArcGIS, Locational Analytics and possibilities of AGOL use by developers' community. Our partners from MapmyIndia and Indicus talked about the AGOL roadmap w.r.t to India specific content and its deployment.

Preconference Seminar on GIS for Roads & Highways was organized in collaboration with Indian Academy of Highway Engineers (under the Ministry of Road Transport & Highways, Govt of India). This seminar aimed at bringing the various stakeholders together to showcase and address building of roadmap for the use of GIS for State and Nationwide Roads Information and Management Systems. The seminar was inaugurated by Sh. V L Patankar, Additional Director General, MoRTH, Govt of India. The keynote address was given by Terry Bills, Global Transportation Industry Director, Esri Inc. who focused on how GIS is useful for the Roads and Highways segment and how it is being used globally for managing the transportation segment. The other India users who shared their experiences of using GIS technology exclusive for the said segment were - Ravi Prasad, Director, IAHE,Dr. B K Durai, Sr. Principal Scientist & Head, PME Division, CRRI, Dr.P Rajakumar, Assistant Divisional Engineer (IT), Tamil Nadu Highways Department, Dr. Vivek Chitale, Senior Technical Director & Head Geomatics & Digital Signature Division, NIC, Bhopal and Satyakam Sahu, General Manager (Traffic & Transportation), LEA Associates SA.

The second edition of Developers Summit brought together software developers both from the GIS and non GIS community to interact and get cognizant on the latest advancements in GIS technology. The summit was addressed by Esri India team of developers led by Krishna Rao, Sanjiv Dhupkar, Abhishek Sindal and Sanjeevi Kumar. The Developers Summit majorly focused on the ArcGIS Platform

and how ArcGIS Online will be an effective technology tool for developers. This summit aspired to help software developers become more effective at building cross mobile mapping applications and aimed at creating a mechanism that is flexible enough to handle the broad range of dimensions involved in software development. Sharad Arya from TCS and Vishnu Chandra from NIC shared their organizational experience of development

With ArcGIS techno logy.

The two day Esri India user conference on 11-12th December drew a diverse audience of several hundred attendees across the country with a fascinating mix of delegates and bureaucrats from the government agencies, defence, academia and the private sector – a representative of users, future adopters and

drivers of GIS in their respective organizations across the nation. As we know that GIS is transformational and has been changing how we conceptualize and see the world. GIS is transforming geography, transforming health and public safety, transforming green buildings, transforming libraries, roadways, education, and national security. In line with the true potential of GIS, theme of this year's conference was "GIS Transforming our World".

The conference was opened by Agendra Kumar, President, 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, inter

act and discuss the new developments in Esri technology. Agendra also announced a strategic alliance between Esri India with MapmyIndia. As part of the agreement, both Esri India and MapmyIndia will collaborate to offer cutting edge GIS solutions along with rich map data to enterprise and Government customers.

The plenary session was kicked off by Dean Angelides, Director, International Operations, Esri Inc., Who spoke about the technological ability of GIS to manage numerous challenges of real world such as climate change and disaster management. "GIS provides a visual picture of what all is happening. It is changing the way we think and act", he said. Emphasizing on the need of Web GIS, he said "Web GIS is a turning point as it gives the power to integrate all types of data. Dean's keynote was further followed by a keynote address by Rajesh Mathur, Vice Chairman, Esri India, who gave the Indian perspective of technology vision for India and how GIS has been transforming our nation and how GIS technology has evolved and used in various sectors in India. He said," GIS a revolutionary step for a roadmap for a smarter society".

Two eminent Esri users in India shared experiences of how their organizations have been using GIS for the benefit of the society. Dr. S N Das, Director, Maharashtra Remote Sensing Application Centre addressed the audience with the issues related to metadata standard, data sharing and accessibility with the slide show of Maharashtra Geo-portal as the success story of GIS implementation. Sunil Pawar (IFS), DCF – Bidar, Karnataka Forest Department highlighted the success story of GIS implementation by the Karnataka Forest Department like e-Greenwatch, forest encroachment information system, HULI, forest fire mapper etc.

Rakesh Verma, MD, MapmyIndia spoke about how businesses and government users can better leverage the maps provided by MapmyIndia for the Indian geography through AGOL platform. Srinibas Patnaik, Senior Director, Digital Globe addressed the user conference highlighting the Imagery and Information services for ArcGIS users.

Mr. Arvind Thakur, CEO, NIIT Technologies, addressing the gathering at the user conference said, "GIS technology is playing an important and significant role in making us understand the various challenges being faced by the human race". After addressing the gathering Mr. Arvind Thakur presented the Esri India Awards for the

year 2013 to our Esri users for outstanding applications of geospatial technology. The Esri India Special Achievement in GIS (SAG) award category had three recipients - Gujarat Gas Company Ltd (GGCL), Orange City Water Pvt. Ltd (OCW) and Maharashtra Remote Sensing Application Centre (MRSAC) respectively. GGCL used geospatial technology to create enterprise level Web GIS system and complete integration of framework that utilizes and processes network enabled GIS and non GIS data in a customized manner over the web and with other shared services of enterprise systems. OCW has pioneered the extensive use of GIS for utility segment creating hydraulic model and maps to enhance their capabilities for addressing issues in the water distribution network. MRSAC has promoted Esri technology to 25 state Government departments and academic institutions for use in various applications developing Web-geoportal & information / decision support systems, creating data warehouse and information dissemination framework. The 'Making a Difference Award' is given to people/institutions who are changing the lives in the society through use of GIS technology. This this award was presented to ICT Centre, Karnataka Forest Department for developing the Web based GIS system for day-to-day surveillance and development activities, query on the maps on the move via a mobile device or a browser interface,

integrating with various Decision Support Systems of the Forest Department for analysis on Geo spatial interface for effective visualization and decision making via email and SMS system for automated responses.

The Esri Technology exposition showcased the latest features of ArcGIS technology and a view into future versions of ArcGIS. Krishna Rao TVB, Head Technical Support, Esri India and his team, gave a complete insight into the latest developments such as 3D GIS functionality, data interoperability, advanced geoprocessing, data management, Geo-event server for real-time tracking and decision. 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 along with new version of ENVI 5.1. The sessions also covered technology areas such as ArcGIS Online, Portal for ArcGIS and Locational Analytics.

This year Esri India also organized aGIS Quiz for our esteemed users. Quiz had four participating organizations- Reliance Jio Infocomm, TCS, Teri University and BSES. The winner of the GIS Quiz was TCS (Participants – Sharad Arya, Sumit, Ravindra Singh) and First Runners Up was TERI University (Deepika Mann, Bakul Budhiraja, Florencia Matina Tuladhar)

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 MapmyIndia, NIIT University, NATMO, NeSTIT, ADCC, HP, Reprographics, Survey of India, Registrar General of India and IAHE showcasing the cutting edge development in the geospatial domain. Exhibitors had an opportunity to display their hardware, software, datasets, data services, application products and GIS information to the user community.

The second day of the conference started with great excitement and interactive participation by various users shared their innovative ideas and research work with the GIS fraternity. The most highlighted one was the interactive half day seminar on Standards And Interoperability where Dean Angelides, Satish Sankaran and Krishna Rao TVB discussed on how to leverage Standards and Interoperability to create pragmatic Spatial Data Infrastructures (SDI) and also discussed about the OGC - Esri compliance

A total of 40 papers and 21 posters presentation were made by our esteemed GIS users. A series of success stories from across sectors such as new technology developments, healthcare, forestry and environment, infrastructure, disaster management were presented during user presentations.

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 "GIS – Transforming our World".The panelists were, Vandana Sharma, DDG (RS & GIS), NIC, Milind Deshpande, Sr. Vice President, Reliance Jio Infocomm, Maneesh Prasad, Editor in Chief, Directions Magazine India, Terry Bills, Global Transportation Industry Director, Esri Inc. and Rajesh Mathur, Vice Chairman, Esri India who was the moderator of the panel discussion. The forum discussed the various aspects geographical domains that have enabled GIS tools to share geographic information, interact with stake holders for future development of software technology and solutions.

The conference ended with an awards ceremony for the User Presentations and an invitation to the delegates for the User Conference scheduled for December 2014. Awards were presented under the Best Paper, Best Student Paper and Best Poster categories ●

Bhutan GIS User Conference:
GIS for Cross National Happiness

G IS conference for Cross National happiness was organized in the beautiful Land of the Thunder Dragonwhere the best of traditional culture thrives and the latest global developments are enthusiastically embraced. The National Land Commission (NLC) Bhutan organiseda 2 day Bhutan GIS user conference from 25-26 November 2013 at Thimphu, Bhutan in collaboration with Esri Inc., USA and Integrated Mountain Development (ICIMOD). The conference was attended by almost 100 scientists and delegates across Bhutan from various departments of the Bhutan government and thiswas the first-of-its-kind Bhutan User Conference thathelped promoting GIS awareness and encouraged strategic GIS-related collaborations for dealing with regional issues.

The conference was opened by the DashoSangayKhandu, Honorable Secretary of National Land Commission of Bhutan who spoke on online GIS interface as a medium for dissemination and access of data and information. Giving the Inaugural Address,Honorable LyonpoYesheyDorji of the Ministry of Agriculture and Forest (MoAF) emphasized the significance of GIS as an enabling technology for planned and sustainable development of any Nation. This was followed by a Keynote Addresses by Mr. Rajesh Mathur, Vice Chairman, NIIT GIS Ltd who spoke on building of Bhutan GIS and Mr.Basantha Shrestha, ICIMOD stressed the use of GIS and related technologies for improving environment management and climate resilience in the Hindu Kush-Himalayan Region.

The two day conference had a series of presentations from the Local departments, ICIMOD, Esri and SERVIR. Mrs. Seema Joshi from Esri India showcased "ArcGIS Platform", how ArcGIS Online would help in building up Bhutan GIS. In another joint presentation entitled "From Space to Village…and Village to Space," NASA SERVIR Project Director Daniel Irwin, NASA Applied Sciences Capacity Building

Program manager Nancy Searby, and USAID Global Climate Change Team Director Bill Breed discussed connecting space technology to on-the-ground environmental challenges through SERVIR.

The Bhutan GIS User Conference ended with hope that the event helped the scientist and delegates that it kept them abreast with the latest trends and technology advancement in the field of GIS, and expressed interest in making this conference a regular event ●

Transformation and Opportunity

It's a good time to be a GIS professional

GIS manager Ian Wint discovered he could rapidly expand the City of Ft. Lauderdale's collection of mapping applications in a fraction of the time by configuring the templates from Esri like this Park Finder application.
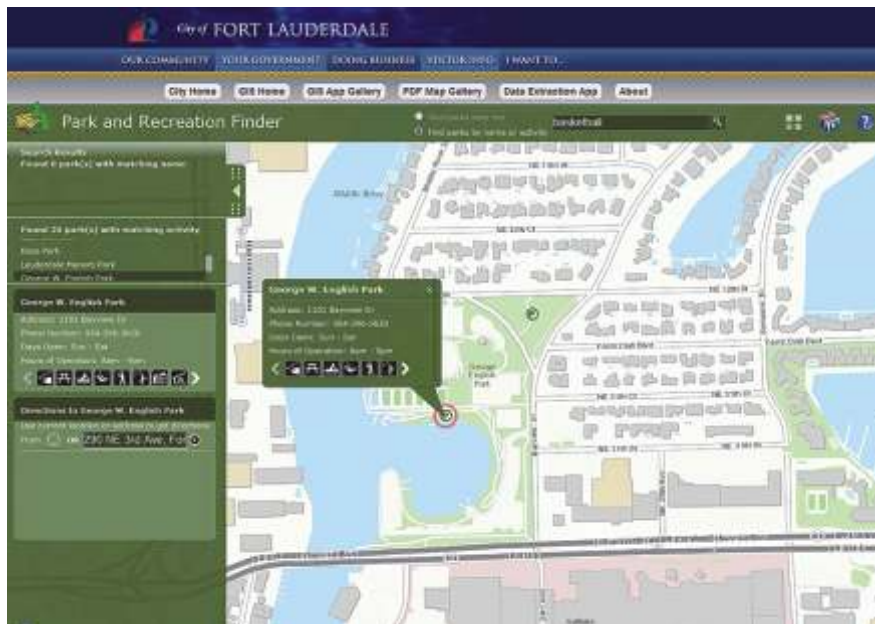
Not only has the demand for your skills remained strong in government, utilities, and natural resources organizations, but the commercial real estate, insurance, marketing, and logistics industries are discovering the value of GIS and are providing new opportunities for GIS professionals. As positive as this situation is, the future is even brighter.

Why?

Because GIS is undergoing a profound transformation. It is becoming web GIS.

What Is Web GIS?

It is a new pattern for delivering GIS capabilities that lets people everywhere access and use geographic information on desktops, the web, tablets, and smartphones. Web GIS is the centerpiece of Esri's strategy for implementing GIS as a platform.

Cabarrus County, North Carolina, GIS administrator Zachary Woolard implemented Esri's Polling Place Locator template. "Within a week of discussing how we could improve our service, we were demonstrating the completed application to our Board of Elections, " said Woolard.

Conceptually, web GIS is agnostic with regard to how it gets implemented. It can run on a local network on-premises using ArcGIS for Server and Portal for ArcGIS or on ArcGIS Online in the cloud hosted by Esri or some combination of these strategies.

Web GIS expands, rather than replaces, existing GIS in organizations. With web GIS, people can not only access maps and apps on consumer devices and the web but easily build maps that work everywhere. With the wide variety of ready-to-use applications and application templates, there is far less need for creating custom applications.

What Can You Do with Web GIS?

The web GIS pattern also provides a new pattern for integration. Maps and apps can bring in all kinds of data from tables, enterprise systems, and spreadsheets and integrate it with social media and sensor networks.

With ArcGIS GeoEvent Processor for Server, an extension to ArcGIS for Server, your organization can take advantage of the vast quantities of data being captured in this increasingly instrumented world by ingesting streams from social media, in-vehicle GPS devices, and many sensor sources in real time and performing continuous analysis and processing as the data is received.

Through dynamic linking from distributed services using web services and web maps, almost any data source can be integrated. This sidesteps the process of carefully restructuring data using data models that was previously required.

Integrating GIS with other business systems, previously a formidable task, is now much simpler. Because web GIS is based on simple protocols like REST and other web standards, it can effectively embed GIS into existing enterprise systems like IBM Cognos, MicroStrategy, and SAP.

Easy map creation and integration with business systems build cross-organizational collaboration, enhancing communication, and optimizing access to information. Web

GIS makes it possible to tap into information from outside the organization by using the vast collections of ready-to-use maps and GIS services, including geocoding, routing, and geoenrichment accessed through ArcGIS Online. Whether web GIS is implemented through ArcGIS Online or Portal for ArcGIS, sharing maps and other resources is secure so web GIS can be used as a mapcentric content management system.

Why Does It Matter to You?

Because GIS is transforming, so is your job. GIS professionals will be essential to this transformation.

In the last few years, GIS departments have dealt with less of some things (fewer staff members, less time, and smaller budgets) and a lot more of other things (end users to support, technologies and platforms to implement and maintain, and new data types). It's now time to let go of a few things. Let go

Instead of taking a month to full fill each request for ahard-copy map, the Regional Transportation Authority (RTA) directs internal and external customers to an online map where they can interactively select a data set,transit service, or jurisdiction and view it and run analyses on it in A matter of minutes.

of the search for that monolithic killer that will meet all your organization's needs. Let go of making endless one-off paper maps. Let go of PDFs on your website that are nearly obsolete as soon as they are created.

These things should not be your focus.

The world moves too fast, and your time is too valuable to be spent on lower-level tasks. Embrace web GIS and the multiplier effect it can have on your impact on the organization. As a GIS professional, web GIS is the best way to increase the value of your work by sharing it with non-GIS staff. People in your organization who are eager to use maps can now do that on their own consumer devices.

ArcGIS for Desktop remains the primary tool for creating authoritative data and high-quality maps. A library of useful maps and resources built using desktop GIS is the foundation of web GIS. In recent years, map publishing work flows have been re-engineered to make it simpler to move work from the desktop to the web. Desktop users can contribute maps and make them available to as many people as desired almost instantaneously from literally any device or client.

Beginning with ArcGIS 10.2, more GIS services will be available from ArcGIS Online, including analytical services such as routing with live traffic data, terrain analysis, and enhanced worldwide geocoding. ArcGIS 10.2 also introduces

a new ArcGIS for Server extension called Portal for ArcGIS that delivers mapcentric content management and web maps tools like ArcGIS Online but is designed for users who host ArcGIS completely within their own infrastructure.

ArcGIS Online and Portal for ArcGIS multiply the value of
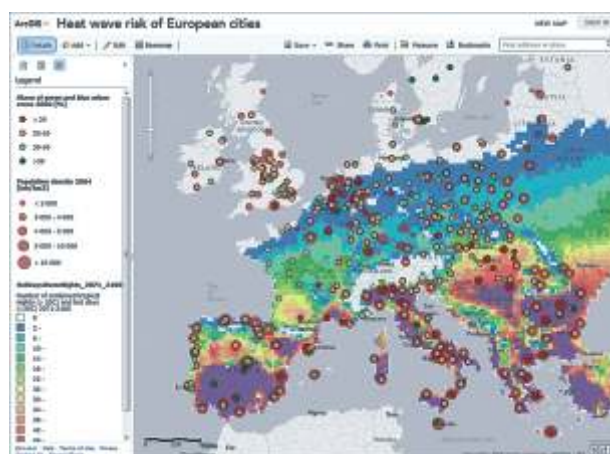
With Web GIS, you and your users can incorporate information from outside the organization by using the vast collections of ready-to-use maps andother resources shared on ArcGIS Online such as this map created by the European Environmental Agency showing the heat wave in Europe During the summer months of 2013.

ArcGIS for Server investments by transforming ArcGIS for Server services into information products that are easily available to anyone in the organization, solving the challenge of providing information quickly in a usable format. Organizational users can use maps and layers as is, add local data, or include data and services from ArcGIS Online to answer their own questions and create new information that can be shared back. With ArcGIS for Server and ArcGIS for Desktop, both servers and desktops can be connected with ArcGIS Online to create a fully integrated web GIS.

Web GIS Increases the Demand for GIS Professionals

Many GIS departments are using web GIS to carry out their traditional activities more effectively by enabling users to benefit from the powerful visualization and analytic tools available from ArcGIS Online. Other GIS departments are expanding the vision and role of mapping and GIS by involving all parts of their organizations.

Because web GIS is based on simple protocols like REST, it can integrate data from many sources such as the live data feeds of current and recent tropical storm locations obtained from the National Hurricane Center and the Joint Typhoon Warning Center.

In either case, web GIS is being implemented as single-topic self-service maps and apps that don't require training or tutorials. Want to know where parks are in your city? Web GIS has an app for that—specifically, the Park and Recreation Finder app available from the AcGIS for Local Government Resource page. These and the many other map apps and templates are constantly developed and released by Esri.

These apps let users help themselves to answers using your organization's most current data. They solve common problems and require only configuration to get them up and running, eliminating the long (and expensive) development cycles associated with traditional monolithic, "do it all" applications. Using this approach lets GIS departments get a greater return on existing investments in GIS.

Because web GIS is based on simple protocols like REST, it can integrate data from many sources such as the live data feeds of current and recent tropical storm locations obtained from the National Hurricane Center and the Joint Typhoon Warning Center.

In a world increasingly transformed by geospatial information, there is an increasing demand for GIS professionals who possess knowledge and skills that include

- Organizing and managing geographic data

- Designing maps as effective information products for decision makers and the public

- Understanding GIS system configurations and architecture

- Engineering work flows for systematically collecting and updating geographic data layers

- Working with institutions to integrate GIS and geographic data with other systems

- Managing policies for data sharing and collaboration

- Designing and building applications and apps that support organizations in the use of geographic information

- Advocating the use of geographic thinking in problem solving across organizations

- Ensuring continuity of information management

- Creating decision support applications

- Integrating geographic data with enterprise computing and other enterprise-focused IT technologies

- Integrating remote-sensing data with GIS

- Developing collaborative relationships with other

ArcGIS 10.2 Transforms GIS

ArcGIS 10.2, a full release of ArcGIS, makes it easier to deploy web GIS, the key component for implementing GIS as a platform.

ArcGIS Online, a collaborative, cloud-based platform, is the key to this new GIS pattern because it lets members of an organization create, share, and access maps, applications, and data across desktop, server, web, and mobile apps both within and between organizations.

With more ready-to-use apps and app templates, ArcGIS 10.2 further enables people to easily build maps that work seamlessly across different devices and reduces the need to create custom applications.

The vast collection of geographic data available from ArcGIS Online can be accessed on the web, desktop, and server in additional to mobile devices. Okavango Delta, Botswana, is shown in the Imagery with Labels and Transportation web map, which uses the World Imagery map service combined with two reference layers.

An Integrated System

This release more tightly integrates ArcGIS Online with ArcGIS for Desktop and ArcGIS for Server. ArcGIS Online also provides access to vast collections of ready-to-use maps and GIS services. Its basemaps and other resources are constantly being updated. For example, the World Imagery basemap, last updated in June 2013, provides one-meter or better satellite and aerial imagery in many parts of the world and lower-resolution satellite imagery worldwide.

To ensure that ArcGIS for Desktop users have access to ArcGIS Online capabilities, every customer organization that has ArcGIS for Desktop at any license level—Basic, Standard, or Advanced—and is current on maintenance now receives an ArcGIS Online subscription. The number of named users will be equal to the total number of ArcGIS for Desktop licenses current on maintenance. Maps can be published directly from ArcGIS for Desktop to Portal for ArcGIS and ArcGIS Online.

In addition to better integration with ArcGIS Online, ArcGIS 10.2 brings improvements in performance, security, and functionality: additional tools for working with geodata, new analytical and imagery tools, improved access to 3D capabilities, and better mapping and reporting. Performance has been greatly enhanced with the expansion of parallel processing capabilities and optimized file handling.

This release adds significant analytical capabilities with 16 new geoprocessing tools that include new conversion tools for Microsoft Excel and JSON and 74 new or modified tool parameters. New tools, like the Optimized Hot Spot Analysis, streamline complex, multistep workflows by determining optimal settings and automatically creating a statistically significant analysis.

Now a core product, Portal for ArcGIS can be deployed on an internal network to share maps, applications, and other geographic information. The content is delivered through a customizable website. ArcGIS 10.2 for Server can be

GeoEvent Processor enables real-time GIS for streaming data. It automatically alerts personnel in real time when specified conditions are met.

configured to work with the Portal for ArcGIS so map and feature services hosted on ArcGIS for Server can be made available to users in an organization through the portal. ArcGIS for Server print and geocode services can also support maps and applications users create in Portal for ArcGIS.

Administer ArcGIS for Server More Easily

Features at 10.2 improve the control administrators have over user behavior that could adversely impact performance, simplify administrative tasks, and make it easier to roll the site back to a previous state.

• Caching Controller, a new geoprocessing service, manages all jobs being processed by the CachingTools service. It is preconfigured in the System folder. The Caching Controller service prevents a server from becoming overwhelmed when multiple publishers submit caching jobs simultaneously. The maximum number of instances (caching jobs) is specified and any additional caching jobs are queued.

• To prevent publishers from automatically copying data to the server when publishing, data copying can be disabled using Manager rather than through the ArcGIS Server Administrator Directory.

• Service Workspaces, a new dialog box in ArcGIS Server Manager, lets an administrator keep track of which folders or databases are being used by site services.

• Now administrators can make a backup of the site configuration to a single file. This file can be used to restore site settings using new command line utilities or the ArcGIS Server Administrator API.

• A map service with feature access enabled (i.e., feature service) can be published to ArcGIS for Server from a supported database. Publishing from a geodatabase is no longer required.

Real-Time GIS

ArcGIS GeoEvent Processor for Server, a new optional extension to ArcGIS for Server (Standard and Advanced), enables real-time GIS for streaming data. It ingests GPS from mobile devices, social media, and virtually any other type of streaming data, changing everyday GIS applications into frontline decision apps that speed response.

Multiple, dynamic events can be monitored, automatically updating maps and databases. From the

distance of a delivery truck from a warehouse to the location of a plane in relation to a storm, GeoEvent Processor can automatically alert personnel in real time when specified conditions are met. It integrates these capabilities within modern enterprise IT architecture.

Supporting Better Decisions

Because it makes more analysis tools available, ArcGIS Online extends these capabilities to everyone. Analysis can be performed online and shared as hosted services. Advanced analysis tools have been added to ArcGIS Online, as well as ArcGIS for Desktop, that help investigate geographic relationships, patterns, and trends within data. Premium Content services support more comprehensive analysis with access to large collections of demographic, elevation, and landscape data.

New tools in ArcGIS Online include overlay layers that combine two or more layers into a single layer and data enrichment resources for gleaning more information about the people and businesses located within an area, which can be delineated or determined by drive time.
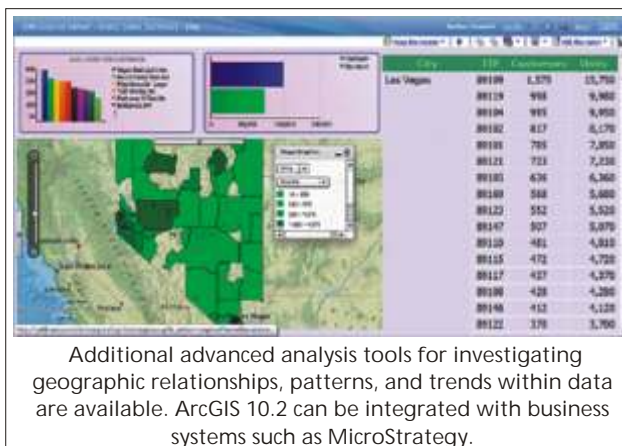
Esri Location Analytics brings ArcGIS tools and methodologies to traditional business analytics systems, combining geographic data on assets, infrastructure, transportation, and the environment with data on an organization's operations and customers. Most business information contains location information. Customers, assets, staff, and suppliers all exist someplace. Considering these aspects of a business in relation to location provides new insights that can help better meet business challenges, solve problems, or identify opportunities.

With the addition of ArcGIS Online, organizations can access Esri apps, such as Esri Maps for Office, Collector for ArcGIS, and Operations Dashboard for ArcGIS, that amplify the benefits of Esri Location Analytics.

More Secure

Enhanced security for ArcGIS now includes support for Public Key Infrastructure (PKI) and single sign-on authentication. Users can sign in using the user name and password they already use within the organization. With this new authentication capability, ArcGIS Online organizational account administrators no longer need to maintain multiple user credentials for individual application access. This eliminates the need to replicate databases of user credentials for separate applications and systems. Users' personal information remains with the organization, not ArcGIS Online.

An ArcGIS Server security option can force developers to use standardized SQL queries when

Additional advanced analysis tools for investigating geographic relationships, patterns, and trends within data are available. ArcGIS 10.2 can be integrated with business systems such as MicroStrategy.

working with map, feature, image, and Web Feature Service (WFS) services through REST or SOAP. This helps prevent SQL injection attacks and also makes it easier for developers and applications to query ArcGIS Server services. Standardized queries are enforced by default but can be disabled by the server administrator.

New Developer Opportunities

ArcGIS Runtime SDKs for Qt, OS X, and Microsoft .NET Framework join the existing collection of developer tools. To more quickly and easily create powerful web apps, these and the recently revamped web APIs have been simplified and improved with extensive support that includes many samples, widgets, and templates. This means less code to write. The documentation answers questions from developers at any level from beginning to advanced.

A Better View

Handling of imagery, and 3D visualization in particular, have been dramatically improved with version 10.2. Content generation capabilities from Esri CityEngine have been integrated with the desktop so ArcGIS 3D Analyst users can generate 3D geometries from existing 2D and 3D input features using rules authored in CityEngine.
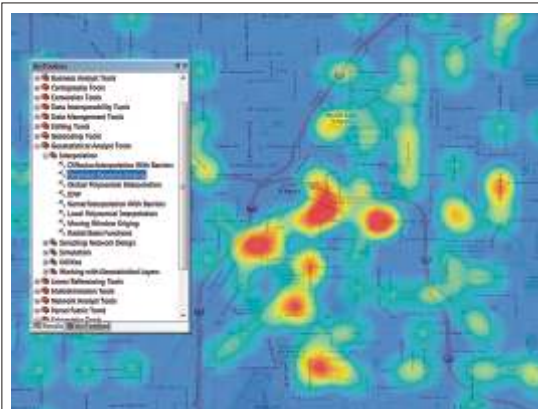
A new capability also lets users publish web scenes. Like web maps, web scenes can be shared and viewed by anyone using just a web browser. Viewers can provide feedback about a web scene using the 3D commenting system. Web scenes can also make service-based requests to geo-coding or other services.

It is also easier to find imagery. Previously, desktop searches were based on file format. Now searches for imagery can be based on accessible metadata. The search index can be configured to search specified paths for raster products, mosaic datasets, and items within a mosaic dataset. Search results can be added directly to a desktop map or into a mosaic dataset.

Lidar processing is much faster. Better tools, new workflows, and the ability to search imagery improves imagery operations. Cached imagery can be uploaded to ArcGIS Online.

Scaling Up GIS

ArcGIS 10.2 delivers improvements across desktops, devices, servers, and the web that enable the widespread adoption of web GIS. It exploits the cloud and big data and other IT trends. This new pattern makes GIS more pervasive and the work of GIS professionals widely accessible, transforming how organizations operate ●

Additional advanced analysis tools for investigating geographic relationships, patterns, and trends within data are availabale in ArcGIS 10.2.

Maharshi Dayanand Saraswati University, Ajmer

Introduction

The Maharshi Dayanand Saraswati University, Ajmer is a comparatively young University of the country that came into existence on 1st August, 1987. Ever since its inception the University has for the last 25 years never settled for a slow pace – it has steadily and successfully marched on the road to development attaining several milestones during its journey of growth and progress. There has been an astonishing growth in the University infrastructure that includes magnificent buildings, hi-tech science laboratories, a state-of-the-art Computer Centre, a prestigious Library, an Administrative and Examination Block, a Science and a Management Block and a highly impressive Vice-Chancellor's Secretariat.

The teaching departments and centres of learning at the university campus include Botany, Commerce, Computer Science, Economics, Education, Environmental Science, Food Science and Nutrition, History, Journalism, Law, Library and Information Science, Management Studies, Microbiology, Political Science, Population Studies, Pure & Applied Chemistry, Remote Sensing and Geoinformatics, Sanskrit, Yogic Sciences and Human Consciousness, Zoology and Center for Entrepreneurship and Small Business Management (CESBM). There are 226 Government and Private Colleges affiliated to this University, which are spread over 4 districts of the state of Rajasthan.

Department of Remote Sensing and Geoinformatics

The Department is unique being the only one of its kind among all universities of the State of Rajasthan The Department of Remote Sensing and Geoinformatics opened under the School of Space Sciences and was introduced in the year 2001. The School of Space Sciences aims at meeting the needs of the society by providing advance training to students in geospatial domain through a structured curriculum with integrated multidisciplinary approach involving latest advances in the fields of remote sensing, GIS, photogrammetry etc. The students passed out with a post graduate degree from the institution are well placed in government and private sector across India and abroad. The Department credits to itself with many projects sanctioned by University Grants Commission, New Delhi, ISRO and Ministry of Environment and Forests, New Delhi.

Course Curriculum

Department of Remote Sensing and Geoinformatics run a two year Integrated Masters Program and Doctoral Programs in Geoinformatics.

M. Sc. Remote Sensing & Geo-informatics (Semester Scheme, No of Seats - 20)

Eligibility:

Bachelor of Natural, Physical & Earth Sciences / Geography, Engineering or Master's Degree in Natural, Phyiscal and Earth Science including geography with 55% marks at graduate/post graduate level. This Masters curriculum is a 4 semester programme where in one semester is completely based on dissertation and Project work on GIS and Remote Sensing.

Faculty of Department

The Department is currently headed by Prof. SarveshwarPalria with a team of inhouse teaching Faculty/Guest faculty. Besides the visiting faculty are from various other organisation like RRSC, Jodhpur, Space Applications Centre (ISRO), Ahmedabad, Birla Institute of Science and Technology, Jaipur, UPRSAC , Lucknow , OTS, Jaipur etc.

GIS Infrastructure

Facility The Department is well equipped with modern equipped with quality equipments required for teaching and research.TheGeomatics Lab is well equipped 40 NOS interactive computer terminals with multiple functions of teaching/ practical in Statistics, Geomatics (Remote sensing and GIS) and communication (animation) and general use for internet browsing, word processing, statistical analysis of data, etc. The Geomatics Facility includes most of the geospatial softwares such as ArcGIS, ERDAS, Geomatica,

IGiSlicensesand relevant instruments as required in the Geomatics domain Like A0 Size Plotter and Scanner and Trimble R3 DGPS and other GPS.

Research Activities

The GIS lab has always instigated and encouraged students to take up research projects. In its endeavour, the lab carries out research work in the field of Biodiversity conservation and Management, Wetlands, National Parks, Climate Change, Urban Planning and Management, studies on Mining impacts and on an overall spatial domain. It is noteworthy that over 200 M.Sc. and 10 Ph.D. Students have completed their project at RS & GIS lab and numerous research and consultancy projects have also been completed. Many research projects are ongoing funded by Ministry of Environment and Forests, New Delhi, SAC/ISRO Ahmedabad ●

For More Details Contact:
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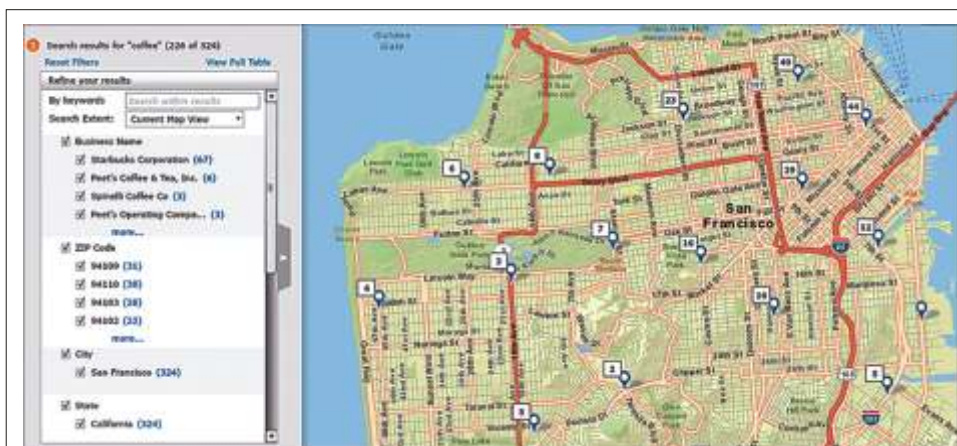
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GIS professionals with a strategic mindset speed implementation and limit cost by using cloud-based solutions like Esri Business Analyst Online that require no infrastructure.

see users as customers. They need to be GIS evangelists and sell GIS by exceeding user expectations.

Self-serve apps don't replace GIS professionals. Freed from rote tasks by self-serve web apps, GIS professionals can concentrate on high-value activities like the creation of authoritative datasets and spatial analyses that yield actionable information for the organization. By embracing the new

information providers

• Finding and acquiring the best commercial data sources

• Performing geospatial modeling

• Applying geodesign techniques

However, to be successful in this new environment will require more than just a diverse skill set. It will require GIS professionals who have a strategic mindset and use a business-oriented approach to implementing GIS. They will succeed by seizing opportunities for combining existing data in new ways with data and services available from ArcGIS Online and always favoring configuration over customization when choosing solutions. When possible, they will speed implementation and limit cost by using cloud-based solutions like Esri Community Analyst and Esri Business Analyst Online that require no infrastructure. GIS professionals also need to

capabilities of web GIS, the benefits of GIS can be spread across organizations.

A New Chapter

By any measure, this is an exciting time for GIS professionals. Web GIS is opening the world's eyes to the power of spatial visualization of information, and this change in perception is transforming how people understand the world. Nevertheless, the fundamental mission of the GIS professional—helping streamline processes, inform decision making, and improve communication by incorporating a geographic perspective—remains the same●

How to use Story Maps as Publishing Platform

Introduction

Maps tell many kinds of stories. They can summarize a situation, trace a route, and show change over time. They can examine causes and effects and reveal in¬terrelationships. They can show patterns of movement and compare and contrast places. They can help people make plans, predict or model the future, and sup¬port decisions. They can explain, reveal, and propagandize.

A story map can also do all of these things. Story maps combine maps with other elements that facilitate and emphasize the message the creator seeks to convey. Title, text, legend, popups, and other visuals—graphs, charts, photographs, video, audio—help interpret the map or maps that form the centerpiece of the story. Story maps include a user experience—a set of functions presented within a user interface—that also facilitate the story. For the most part, story maps are intend¬ed for non-technical audiences. They present geographic information with the goal of informing, educating, entertaining, and involving their audiences.

What is a story map?

Story maps are interactive maps combined with text and other content to tell a story about the world. Typically story maps are designed for non-technical audi¬ences; thus, story maps include all the elements required to tell a story: web maps or map services, text, and multimedia content.

Story maps are at the focal point of the rapid evolution of ArcGIS from a technol¬ogy available only to highly-trained specialists to an array of services and resourc¬es that can benefit everyone. Story maps bring the power of geography and spatial analysis to large audiences. They can be built not only by graphic designers and journalists, but by GIS users, web developers, and anyone with a basic familiarity with web and mobile platforms. They can serve not only the general public, but also within communities and organizations.

Story Maps and ArcGIS

For four decades Esri has been enabling professionals to combine geographic thinking with analytical capabilities to perform many tasks, including spatial analysis, planning, management, decision support, and situational awareness. As GIS software has evolved, and as ArcGIS has embraced Web servers and the cloud, many new opportunities have arisen for non-specialists to benefit from, and to actually utilize, the capabilities of GIS. Story maps use these capabilities to show that ArcGIS can be an effective communications platform.

In particular, story maps tap the content resources and functionalities of ArcGIS Online. Most story maps incorporate Web maps, which combine base maps, the¬matic maps, tabular data, popups, and other functionalities into intelligent maps that can be shared and viewed on multiple devices.

The primary means by which Esri enables people to make their own story maps is this combination of web maps or intelligent maps—built, refined, and shared on ArcGIS Online—that can then be placed into storytelling apps or tem¬plates that provide key components, including narrative elements and a consis¬tent and intuitive user experience.

What Can You Do with a Story Map?

Story maps, built using free Esri story map templates, are a great way to quickly build useful and attractive information products tailored to your organization's needs. You can do a lot more with story maps than identify the best restaurants in town or nearby historical landmarks. Organizations can use them to communicate policy, involve the community, promote a cause, demonstrate benefits, provide public information about an event, educate, or simply inspire.

A story map is a web map that has been thoughtfully created, given context, and provided with supporting information so it becomes a stand-alone resource. It integrates maps, legends, text, photos, and video and provides functionality, such as swipe, pop-ups, and time sliders that help users explore this content. It is a fully functioning information product. While map stories are linear in nature, their contents can also be perused in a nonlinear fashion by interacting with the map.

Using the templates, you can publish a story map without writing any code. You simply create a web map, supply the text and images for the story, and configure the template files provided according to the instructions in the download.

A constantly growing collection of free story map templates are available at the Storytelling with Maps website (http://storymaps.esri.com/home/). Currently, templates that create tours, map matrixes, multipaned comparison displays, and sidebars exist. The Esri Story Maps team is continually developing new templates that refine map-based functionalities and user experiences.

Story maps will help you get the most out of your ArcGIS Online account. You can create map stories to meet specific needs as well as share map stories made by others both inside and outside your organization.

How to make a story map

Story maps are simple web applications that let you combine web maps with text, photos, and other content to tell geography-based stories. Esri has developed a series of apps that accommodate various forms of storytelling, including point-to-point tours, points-of interest collections, and thematic map series. All the apps are open source and can be downloaded from the story maps website or GitHub. Increasingly, configurable apps are directly accessible on ArcGIS Online. Use the share function to choose an app and configure it to suit your needs. It's a six step process to create a story map which is as follow:

1 Consider your audience

Before building your story map, it's important to think about exactly what story you retrying to tell and the audience you want to reach. Text should be brief, maps simple, and message as clear as possible.

2 Build your web map

Web maps combine base maps with overlays, map and feature services, and additional data derived from spreadsheets and shape files. Before you build your map, determinewhich storytelling template you'd like to use. Some

have special requirements; various appsconsume either a single web map, two or more layers of a single map, or several web maps.
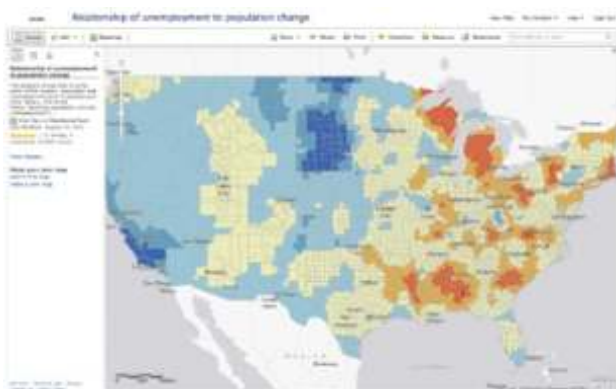
3 Assemble multi media content

Text should be brief. Make your headlines active and descriptive if you can. Some story apps tap web map descriptions; read our how-todocuments for details. Images must be accessible via web addresses, unless they' repart of a feature service (Map Tourapp). Remember: Large images take longer to load, so optimize them to fit the story map.


4 Configure your storymap app

Story map apps can be configured by providing your web mapID number and selecting a few preferences. Many can be configured directly through an ArcGIS Online web interface. For the rest, a README file provided with every app steps you through configuration and hosting options.

5 Refineyour storymap

Our apps enable users to quickly create and publis hstory maps. As with all creative efforts, however, the quality of your
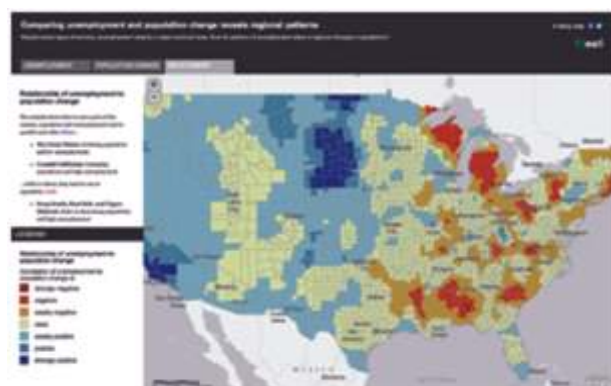
story will increase as you refine it. Details, such as map colors and symbols, popup design, wording of map legends, and choice of photographs, are all vital. Don't be afraid to go back and forth—perhapsmany times—tomake adjustments.

6 Publish your story map

Place your story map on a server that is accessible to your audience—whetherit's the general public or a specialized group behind an organizational firewall. Your ArcGIS Online account provides an ideal platform for publishing your story maps—and for sharing your data, collaborating with colleagues, and accessing the best and latest storytelling apps

Conclusion

Story maps are a new medium. Working in a new medium has its challenges—tools and techniques are rapidly evolving—but it can have significant rewards. Story maps represent a new capability of GIS, expanding its traditional use for planning, analysis, and decision support and making its products accessible to much broader audiences. Geography-based storytelling can provide new insights, including a greater appreciation of causes and context, and an deeper understanding of interrelationships and effects. Well-told story maps will educate, inform, and inspire your colleagues, customers, and constituents.

Source: Esri Website (http://www.esri.com)

Storytelling Map Tour Template

Description

The Map Tour is a storytelling template that combines an interactive map, a photo and text panel, and a thumbnail carousel. The template is available in two versions:

• A hosted version in ArcGIS Online that lets you creates your tour interactively. The interactive builder will prompt you to sign in with either your organizational subscription or a free public account. You can create a map tour with either account type, but the organizational subscription gives you the ability to store your photos in ArcGIS Online.

• A downloadable version that you can deploy on your web server or web site and enhance to fit your needs. The README PDF in the download gives you full instructions and tips for being successful with the template.

Download the Storytelling Map Tour Template and Get Started

All you need is an ArcGIS Online account, access to a web server, a simple graphics program, Microsoft Excel or a text editor, and (optionally) ArcGIS for Desktop.

The Storytelling Map Tour template is one of the free templates Esri provides for creating story maps. This tip shows you how to create a map tour story map by downloading the template Esri provides, creating a web map using ArcGIS Online for your tour, and then configuring the template to display your web map. It's easier than you think!

Step 1—Come up with your tour idea
The Storytelling Map Tour template is designed for presenting geographic information where there is a compelling photographic element to the story you want to tell. Be creative!
Step 2—Install the template
Download the ZIP file containing the map tour template. Unzip this file and copy the contents into a new folder in the

file structure of an existing website or web server that you have access to so that the folder is publicly accessible to users on the web.

You simply put the template files onto any website or web server that you have access to or that your organization maintains. The location of the template's index.html file defines the URL that will be used to access your map tour. For example, if your website is using a web server like Internet Information Services (IIS), and you create a folder in its root called C:\inetpub\wwwroot\map_tour, and your website's domain is http://www.example.com, then the URL of your map tour will be http://www.example.com/map_tour.

Step 3—Assemble Your Images
For each point in your map tour, you will need two image files: one at full size for display to the left of the map and a small thumbnail image for display in the thumbnail strip underneath the map. Images should be in JPEG format.

Each point in your map tour references its full-size image and its thumbnail image on the web via a URL, so you will need to make your image files available on the web.

Step 4—Assemble your map tour points in a file
Assemble your map tour points in a comma-separated value (CSV) file, which is a simple text file. Each record in that file defines one point in your tour. Call your file Locations.csv. The file needs to contain name, caption, image URL, and thumbnail URL fields that are required by the template. In addition, the geographic location of each point has to be given either as latitude and longitude fields in decimal degrees or as a street address (in a single field or in separate address, city, state, and ZIP code fields).

Keep the caption text short, because it will appear on top of the full-size image, and on smaller displays like the iPad, a lot of text could cover up too much of the image. Limit your captions to 350 characters or less, including spaces.

Step 5—Create your web map
Log in to ArcGIS Online using either a free public account or ArcGIS for Organizations subscription account and create a web map for your map tour using the map viewer. Load the Locations.csv file you created in the previous step into the web map as a new layer using the Add Layer from File command on the Add menu or by simply dragging the file onto the map.

You don't need to specify symbology or pop-up windows for the layer in the web map. The template automatically defines how the tour points layer will be displayed.

Finally, save your web map. The title and summary you use when you save the map will automatically become the title and subtitle of your map tour. Click Share and choose Everyone (public) to make the web map available to everyone.

Step 6—Configure the template
Now that you have created your web map and shared it publicly, you are ready to configure your template.

1. First, configure the template to use your web map. In the template folder, open the index.html file in any text editor, such as Windows Notepad or Windows Wordpad. Look for the template configuration section of the file.
   //------------------------------ // Template configuration
   //------------------------------

2. In the template configuration section, update the webmap property to be the ID of your web map. This Tells the application which web map to use. For example, our National Mall walking tour web map has the URLarcgis.com/home/webmap/viewer.html?Webmap=a5019e8c55d547eab69c0777dcd7509a, and the ID of this map is the last part: a5019e8c55d547eab69c0777dcd7509a.

   configOptions = {
   // The web map id   webmap:
   "A5019e8c55d547eab69c0777dcd7509a",

3. The FIRST_RECORD_AS_INTRO parameter listed below the web ID in the config section controls whether or not the first record in your tour points layer is to be handled as an introduction for the map tour that does not appear on the map as a tour point. By default, this is set to true. If you change this value to false, the first record in your tour point layer will be the first point shown on the map.

   // Use the first data record as an introduction instead of a point firstRecordAsIntro: true,

4. Close and save the index.html file. (There are some other parameters in the template configuration, but you don't need to set them. See the README file in the download for more information about those.)

5. In the App folder in the template download, open the maptour-config.js file in a text editor. These parameters at the top of the file let you change the logo graphic and links shown in the top right-hand corner of the story map. You can also change the colors used by the story map:
   // Header Logo
   HEADER_LOGO_URL: "resources/icons/esri-logo.png",
   HEADER_LOGO_TARGET: "http://www.esri.com",
   // Header top right link
   HEADER_LINK_TEXT: "A story map",
   HEADER_LINK_URL:
   "http://storymaps.esri.com/home/",
   // Header, Picture Panel and Carousel colors
   COLORS: ["#444", "#797979", "#c2c2c2"],
   For example, to use your own logo graphic, put the image in the resources/icons folder in the template and update the HEADER_LOGO_URL parameter with the name of your file.

6. Close and save the maptour-config.js file. You can, of course, continue to edit and customize the code in any way you want! That's why we freely provide the code for the app as part of the template.

You are done!
Your story map is now live. If you launch the URL of your map tour in a web browser (i.e., the path to the folder in which you installed the template on your web server or website), it should work ●

Routing in Flex Mobile

This sample demonstrates how to use the RouteTask to calculate a route with distance and time traveled, it also displays a list of directions you can click on that will take you to the individual travel segment.

To begin: click the "Get Directions" button, once the route is displayed, click on individualroute description segments to view that portion of the route. Click on theroute summary to zoom to the full extent of the route.

```
<?xml version="1.0" encoding="utf-8"?>
<s:View xmlns:fx="http://ns.adobe.com/mxml/2009"
    xmlns:s="library://ns.adobe.com/flex/spark"
title="HomeView"
    xmlns:esri="http://www.esri.com/2008/ags"
    >
<fx:Declarations>
    <!-- Place non-visual elements (e.g., services, value
    objects) here -->
</fx:Declarations>
    <fx:Style>
    @namespace mx "library://ns.adobe.com/flex/mx";
    @namespace s "library://ns.adobe.com/flex/spark";
    @namespace esri "http://www.esri.com/2008/ags";
    .linkStyle
    {
        color: blue;
        text-decoration: underline;
    }
    mx|ToolTip
    {
        font-size: 14;
        backgroundColor: #EEEEEE;
    }
</fx:Style>
<fx:Script>
    <![CDATA[
        import com.esri.ags.FeatureSet;
        import com.esri.ags.Graphic;
        Import com.esri.ags.events.RouteEvent;
Import com.esri.ags.tasks.supportClasses.AddressCandidate;
        Import com.esri.ags.tasks.supportClasses.
        AddressToLocationsParameters;
        Import com.esri.ags.tasks.supportClasses.
        DirectionsFeatureSet;
        Import com.esri.ags.tasks.supportClasses.
        RouteResult;
        import mx.core.UIComponent;
        import mx.rpc.AsyncResponder;
        import mx.rpc.Fault;
        import mx.rpc.events.FaultEvent;
        private const NL:String = "\n";
        [Bindable] private var stopsFS:FeatureSet =
        new FeatureSet();
        [Bindable] private var directionsFS:Directions
        FeatureSet;
        private var segmentGraphic:Graphic;
```

```
Private function getDirections():void{
        stopsFS.features = [];
        directionsFS = null;
        TheDirections.removeAllElements();
        theDirections.toolTip = null;
        theRouteName.toolTip = null;
        theSummary.toolTip = null;
        segmentGraphic = null;
        Map.defaultGraphicsLayer.clear();
        Var fromParameters:AddressToLocations
Parameters = new AddressToLocationsParameters();
        fromParameters.address = { SingleLine:
fromTx.text, CountryCode: 'US' };
        fromParameters.outFields = [ "Loc_name" ];
        locator.addressToLocations(fromParameters,
new AsyncResponder(
        myResultFunction, myFaultFunction, "From"));
        Var toParameters:AddressToLocations
Parameters = new AddressToLocationsParameters();
        toParameters.address = { SingleLine: toTx.text,
CountryCode: 'US' };
        toParameters.outFields=["Loc_name" ];
        Locator.addressToLocations
(toParameters, new AsyncResponder(
        myResultFunction, myFaultFunction, "To"));
        function myResultFunction(result:Array,
token:String = null):void
        {
        solveRoute(result, token);
        }
        function myFaultFunction(error:Fault,
token:Object = null):void{
        }
    }
    private function solveRoute(addressCandidates:Array,
type:String):void
    {
        if (addressCandidates.length == 0){
            return;
        }
        var stop:AddressCandidate =
 addressCandidates[0];
        if (type == "From"){
        var fromGraphic:Graphic = new
Graphic(stop.location, fromSymbol, { address: stop.address,
score: stop.score });
        map.defaultGraphicsLayer.add(fromGraphic);
        stopsFS.features[0] = fromGraphic;
        }
        elseif (type == "To"){
        var toGraphic:Graphic = new
Graphic(stop.location, toSymbol, { address: stop.address,
score: stop.score });
        map.defaultGraphicsLayer.add(toGraphic);
        stopsFS.features[1] = toGraphic;
        }
        if (stopsFS.features[0] && stopsFS.features[1])
        {
```

```
            routeTask.solve(routeParams);
        }
    }
    PrivatefunctionsolveCompleteHandler(event:RouteEvent
    ):void{
        varrouteResult:RouteResult =
    event.routeSolveResult.routeResults[0];
        directionsFS = routeResult.directions;

        map.defaultGraphicsLayer.add(new
    Graphic(directionsFS.mergedGeometry, routeSymbol));
            Var i:int = 1;
            vartextCntl:Label;
        for each (varfeature:GraphicindirectionsFS.features)
        {
            textCntl = new Label();
        textCntl.addEventListener(MouseEvent.ROLL_OVER,
    textCntl_rollOverHandler, false, 0, true);

            textCntl.addEventListener(MouseEvent.ROLL_OUT,
    textCntl_rollOutHandler, false, 0, true);
            textCntl.percentWidth = 100;
            textCntl.styleName = "linkStyle";
            textCntl.text = i + ". " + feature.attributes.text;
            if (i> 1 &&i<directionsFS.features.length)
            {
            textCntl.text += " (" +
    formatDistance(feature.attributes.length, "miles");
            vartime:String =
    formatTime(feature.attributes.time);
            if (time != ""){
                textCntl.text += ", " + time;
            }
            textCntl.text += ")";
        }

        textCntl.addEventListener(MouseEvent.CLICK,
    directionsSegmentClickHandler, false, 0, true);
            theDirections.addElement(textCntl);
            i++;
        }
        theDirections.toolTip = "Click individual segment to
    zoom to that segment.";
        theSummary.toolTip = "Click to zoom to full route";
        theRouteName.toolTip = "Click to zoom to full
    route";
            zoomToFullRoute();
    }
    privatefunctionfaultHandler(event:FaultEvent):void
    {
    }
    privatefunctionzoomToFullRoute():void
    {
        if (segmentGraphic)
        {
            map.defaultGraphicsLayer.remove
            (segmentGraphic);
            segmentGraphic = null;
```

```
        }
        map.extent = directionsFS.extent;
        if (!map.extent.contains(directionsFS.extent))
        {
            map.level--; // make sure the whole extent
    is visible
        }
    }
    privatefunctionformatDistance(dist:Number,
    units:String):String
    {
        varresult:String = "";
        var d:Number = Math.round(dist * 100) / 100;
        if (d != 0)
        {
            result = d + " " + units;
        }
        return result;
    }
    privatefunctionformatTime(time:Number):String
    {
        varresult:String;
        varhr:Number = Math.floor(time / 60);
        varmin:Number = Math.round(time % 60);
        if (hr< 1 && min < 1){
            result = "";
        }elseif (hr< 1 && min < 2){
            result = min + " minute";
        }elseif (hr< 1){
            result = min + " minutes";
        }else{
            result=hr + "hour(s)" + min + " minute(s)";
        }return result;
    }
    PrivatefunctiondirectionsSegmentClickHandler(event:Mo
    useEvent):void
        {
        vartextCntl:Label  =  event.currentTargetas
    Label;
        varsegment:Graphic =
    directionsFS.features[parseInt(textCntl.text) - 1];
        map.extent = segment.geometry.extent;
        If (!map.extent.contains(segment.geometry.extent)){
            map.level--; // make sure the whole extent
            is visible
        }
        if (!segmentGraphic){
            segmentGraphic = new
            Graphic(segment.geometry,
    segmentSymbol);
            Map.defaultGraphicsLayer.add(segment
            Graphic);
        }else{
            segmentGraphic.geometry  =
            segment.geometry;
        }
    }
```

```
            Private function textCntl_rollOverHandler(event:
        MouseEvent):void{
                var uic:UIComponent =
                 event.currentTarget as UIComponent;
                uic.setStyle("color", 0xFF0000);
        }
            Private function textCntl_rollOutHandler(event:
        MouseEvent):void
        {
                var uic:UIComponent =
                event.currentTarget as UIComponent;
                uic.setStyle("color", 0x0000FF);
        }
    ]]>
</fx:Script>
<fx:Declarations>
        <esri:Locator id="locator"
                outSpatialReference="{map.spatialReference}"
                ShowBusyCursor="true"
 Url="http://geocode.arcgis.com/arcgis/rest/services/
World/GeocodeServer"/>
        <esri:RouteTask id="routeTask"
                concurrency="last"
                fault="faultHandler(event)"
                requestTimeout="30"
                showBusyCursor="true"
                SolveComplete="solveCompleteHandler
                (event)"
Url="http://sampleserver6.arcgisonline.com/arcgis/
rest/services/NetworkAnalysis/SanDiego/NAServer/Route"/>
        <esri:RouteParameters id="routeParams"
                directionsLengthUnits="esriMiles"
outSpatialReference="{map.spatialReference}"
                returnDirections="true"
                returnRoutes="false"
                stops="{stopsFS}"/>
    <esri:SimpleMarkerSymbol id="fromSymbol"
color="0x00FF00"/>
    <esri:SimpleMarkerSymbol id="toSymbol"
color="0xFF0000"/>
    <esri:SimpleLineSymbol id="routeSymbol"
                width="4"
                alpha="0.5"
                color="0x0000FF"/>
    <esri:SimpleLineSymbol id="segmentSymbol"
                width="8"
                alpha="0.5"
                color="0xFF0000"/>
</fx:Declarations>
<s:VGroup width="100%">
    <s:HGroup width="100%">
        <s:TextInput id="fromTx"
                width="40%"
                text="SAN"
                toolTip="Enter a U.S. address as 'Street,
City, State, Zip'"/>

        <s:TextInput id="toTx"
                Width="40%"
                toolTip="Enter a U.S. address as 'Street,
City, State, Zip'"/>
        <s:Button click="getDirections()" label="Get
Directions"/>
    </s:HGroup>
    <s:HGroup width="100%" height="500"
            gap="0">
    <esri:Map id="map">
        <esri:extent>
            <esri:Extent xmin="-13050868"
ymin="3855075" xmax="-13038065" ymax="3861782">
                <esri:SpatialReference wkid="102100"/>
            </esri:Extent>
        </esri:extent>
        <esri:ArcGISTiledMapServiceLayer
url="http://server.arcgisonline.com/ArcGIS/rest/services/Wor
ld_Street_Map/MapServer"/>
    </esri:Map>
    <s:BorderContainer width="50%" height="100%"
                backgroundColor="0xEEEEEE"
                borderVisible="false">
        <s:layout>
            <s:VerticalLayout paddingBottom="7"
                        paddingLeft="10"
                        paddingRight="10"
                        paddingTop="7"/>
        </s:layout>
        <s:Label id="theRouteName"
                width="100%"
                buttonMode="true"
                click="zoomToFullRoute()"
                fontWeight="bold"
                text="{directionsFS.routeName}"
                toolTip="Click to zoom to full
                route"/>
<s:Label id="theSummary"
                Width="100%"
                ButtonMode="true"
                Click="zoomToFullRoute()"
                text="Total Distance:
{formatDistance(directionsFS.totalLength, 'miles')}{NL}Total
Time:{formatTime(directionsFS.totalTime)}"/>
        <s:Scroller width="100%" height="100%">
        <S:VGroup Id="theDirections"
            width="100%" height="100%"
            MinHeight="0">
        <s:Label width="100%" text="Click 'Get Directions'
above to display driving directions here..."/>
        </s:VGroup>
                </s:Scroller>
            </s:BorderContainer>
        </s:HGroup>
    </s:VGroup>
</S:View>
```
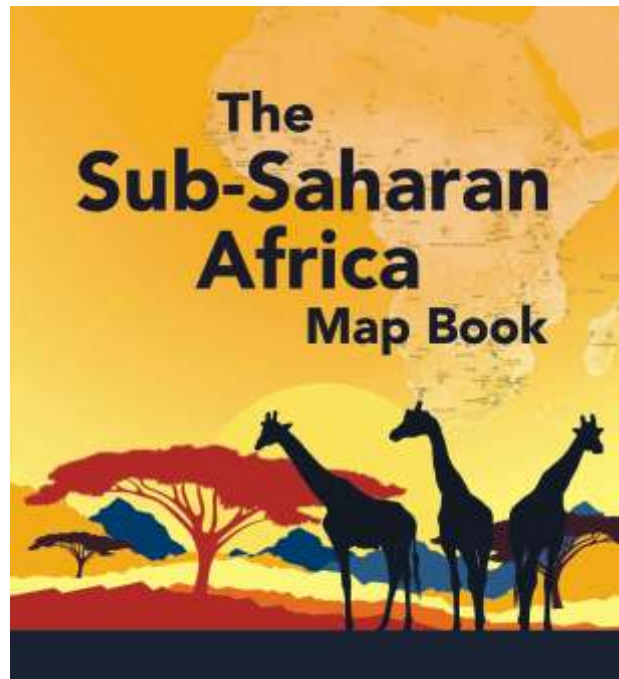
Map Book Examines Humanitarian Initiatives in Sub-Saharan Africa

Redlands, California—The Sub-Saharan Africa Map Book, published by Esri Press, includes a collection of maps analyzing the region's major social, economic, and environmental issues.

In the foreword to the book, Esri president Jack Dangermond writes, "Our world is in a constant state of change, with many regions facing particularly challenging problems. In Africa, the world's second-largest and second-most-populous continent, there are a number of interrelated issues spread across more than 50 countries. Economic instability, social conflicts, spiraling populations, disease, famine, loss of biodiversity, and the effects of global warming are of paramount concern."

The Sub-Saharan Africa Map Book clearly illustrates how GIS technology is currently being used to improve these conditions. Map titles include, "Forecasting Climatic Variation Parameters for Nigeria," "Biodiversity Conservation Planning," "World Heritage Fund Sites in Africa," "Wetlands Maps and Governance Measures of Rwanda," and "Mapping Humanitarian Aid for Displaced People and Refugees along the Ivory Coast."

As these maps show, GIS technology is an integral tool for change—a platform for sharing information and data—that enables researchers, planners, and communities to work together to build a sustainable future.

The Sub-Saharan Africa Map Book (ISBN: 9781589483385, 96 pages, US$24.95) is available at online retailers worldwide, at esri.com/esripress, or by calling 1-800-447-9778. Outside the United States, visit esri.com/esripressorders for complete ordering options or visit esri.com/distributors to contact your local Esri distributor. Interested retailers can contact Esri Press book distributor Ingram Publisher Services ●

C. R. England Adopts Esri Location Analytics to Increase Business Efficiency

Organization Manages Costs for World's Largest Fleet of Temperature-Controlled Trucks

Redlands, California—C. R. England, the world's largest refrigerated trucking company, has adopted Esri Location Analytics for incorporating geographic information, mapping, and spatial analytics into its business processes.

"Being able to analyze the transportation business from a geographic perspective is key to gaining intelligence about our network in terms of driver and customer density, as well as freight routes," said Tao Kong, C. R. England's director of Corporate Engineering Solutions. "This technology can be used to help many aspects of our business gain greater efficiency."

Located in Salt Lake City, Utah, C. R. England analysts will employ the Esri platform which offers built-in quantitative analytical and modeling capabilities, such as location selection, to minimize total traveling distances. These capabilities will help C. R. England make smarter decisions, such as the use of targeted driver recruiting, to help improve driver retention, optimal location selection for maintenance, and driver terminals to minimize out-of-route miles. The company will be able to optimize routes by analyzing freight density, safety performance, highway congestion, fuel economy, and tolls.

"We are pleased to be working with C. R. England," said Wolfgang Hall, Esri's manager of logistics and supply chain management industry. "Its adoption of Esri Location Analytics technology is a strategic move that will help the company continue to grow revenue and control cost."

For more information on how Esri helps logistics and supply chain organizations around the world, visit esri.com/logistics ●

DID YOU KNOW?

Geospatial Visualization and Big Data

Big data is in the foreground of current topics in most IT circles. Understanding big data, like any other emerging technology, requires that it be defined. While the definition is just the beginning of the conversation, ultimately it is the value that big data promises that makes it so intriguing and deserving of attention. The ability to use big data to drive better business outcomes defines its strong appeal.

What is Big Data?

Big Data is popularly defined using the Three "V"s, defined by Gartner as follows:

- Volume: The increase in data volumes within enterprise systems is caused by transaction volumes and other traditional data types, as well as by new types of data. Too much volume is a storage issue, but too much data is also a massive analysis issue.

- Velocity: This involves streams of data, structured record creation, and availability for access and delivery. Velocity means both how fast data is being produced and how fast the data must be processed to meet demand.

- Variety: IT leaders have always had an issue translating large volumes of transactional information into decisions—now there are more types of information to analyze—mainly coming from social media and mobile (context-aware). Variety includes tabular data (databases), hierarchical data, documents, e-mail, metering data, video, still images, audio, stock ticker data, financial transactions and more.

Real world big data applications commonly address one or two of the "V"s. However there are many organizations with big data projects that do indeed incorporate all three; these usually involve high volumes of streaming data from a variety of sources.

What is the promise of Big Data?

Different systems store data in different formats, even within the same company, making it difficult to aggregate data for analysis. As a result, an organization's investment in data, one of its most highly valued assets, goes underutilized. Increased awareness of the value gained by analyzing data in a geographic context drives desire for the ability to discover location based patterns and relationships in big data, to enable improved decision making for better business outcomes.

Who Uses Geospatial Visualization and Big Data?

GIS Analysts: Big data technologies provide access to unstructured, machine generated, web generated, and NoSQL data. Map visualization and geoanalytics on this data can reveal patterns and trends that are beyond the capabilities of traditional databases, spreadsheets, and files. Access to more data types can also refine existing analyses resulting in greater confidence in business decisions.

Non-GIS Users: Business analysts, researchers, and data scientists benefit from map visualization and geoanalytics. Anyone interested in creating actionable information from big data and other enterprise business applications can gain valuable insights by exposing and exploiting the geographic dimension of that data using maps as a visualization tool. Organizing data by location also provides access to other location referenced data, such as Esri's Business Analyst, which further enriches data analyses, improves collaboration, and enables more rigorous decision-making.

Few Examples The following are industry-specific examples of the use of geospatial visualization and big data:

Disaster Relief: Maps that capture social media activities are used to assist relief workers responding to disasters worldwide. Mapping the originating location of social media messages, images, and videos allows relief workers to visualize where specific damage has occurred, the severity of the damage, and how to route resources if a response is necessary.

Financial: Consumer credit card companies are mapping location data from transactional systems (RDBMS), customer information (CRM), and social media streams to build more complete profiles of card users and their behaviors for outbound marketing efforts and fraud detection.

Government: Agencies at the federal, state, and local level use big data for a variety of spatial analyses. Federal government agencies are using geographic information systems (GIS) and big data for many types of activities such as real time location analysis of high volume, high velocity streams of sensor data, fraud detection, and disease surveillance. In local government agencies, big data technology is used to improve the efficiency of call center activities such as city service requests related to asset management and tracking of city service vehicles.

Insurance: Mapping the originating location of social media streams during natural disasters helps insurers monitor financial impact and deploy claims adjusters. Claims adjusters also use big data analytics to detect fraudulent claims and to improve the accuracy of claims.

Natural Resources: The petroleum industry was deeply involved in big data before the term was even invented. Terabytes of location referenced seismic data have been collected from around the world and is available to the petroleum industry for exploration and extraction activities.

Retail: A novel GIS and big data application for one mass retailer monitors and filters social media data based on proximity to a store location. When a message originates within a specified distance from a store, the message is examined to see if a specific follow on activity can be initiated.

Telecommunications: Call centers gather tremendous amounts of data, much of it unstructured or loosely structured. Classifying calls and then mapping them often reveals patterns that indicate localized infrastructure weaknesses.

Utilities: Smart grid applications generate tremendous volumes of utility meter generated data. This near real time data is viewed on maps showing the level of usage on the utility grid and helps managers balance load with supply to avoid outages. Spatial analysis of the grid network can pinpoint assets that could be negatively affected by high usage ●

Careers
at
esri India

1. Role: Software Engineer / Senior Software Engineer

Skill Set

- GIS Development Experience in ESRI Enterprise
- GIS programming in Java
- Expertise in OOAD
- Knowledge on ArcGIS
- Ability to read and generate UML documentation
- Experience in working with XML
- Experience in working with an IDE similar to Eclipse, Netbeans etc.
- Knowledge of Spring framework or similar application development framework
- Demonstrated experience in SOA and Web Services.

Experience
2 - 5 years

Qualification
B.SC/ BE /
B. Tech /
MCA / M.Sc /
M.Tech

Requirement
1

Location
Mumbai

Desired Skill

- Knowledge and experience with CMMi environment preferred
- Knowledge of GIS technologies
- Java based portlet development

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2. Role: Software Engineer / Senior Software Engineer / Technical Analyst

Skill Set

- Should have experience in VB.Net, C#.Net and ASP.Net technologies
- Should have experience in SQL Server, Oracle 10g and PL/SQL
- Should have experience in JavaScript, AJAX
- Should have experience in Crystal Reports
- Should have knowledge in ArcSDE
- Should have knowledge in ArcGIS Server
- Should have knowledge in SDLC process
- Should interface with client for Requirement Analysis and technical queries

Experience
1 - 7 years

Qualification
B.SC/ BE /
B. Tech /
MCA /
M.Sc /
M.Tech

Requirement
9

Location
Bangalore /
Gurgaon /
Singapore

Desired Skill

- Knowledge and experience with CMMi environment preferred
- Knowledge of GIS technologies

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