



## **VALUE ADDED SERVICES FOR NATIONAL SPATIAL DATA INFRASTRUCTURE**

**By**

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### **ABSTRACT**

The paper is an attempt to highlight value added services required for successful implementation of National Spatial Data Infrastructure (NSDI) at the national level. Industry can provide value added services to various organizations in the following areas:

- Creation of Metadata for NSDI node
- Assisting each organization to create their metadata for their own website and for posting to the NSDI node
- Web GIS implementation services at NSDI node and for each of the participating agencies.
- e-Security / e-commerce services.
- Interoperability between different GIS platforms displayed within a participating agency and at the user end.

The Scope of services is enormous. The industry has to work hand in hand with NSDI / each participating agencies to deliver GIS tools and customized services, to make NSDI a reality.

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## **01. Overview**

National Spatial Data Infrastructure (NSDI) is an initiative undertaken jointly by Department of Science and Technology and Department of Space, Govt. of India. NSDI is aimed at encouraging collection, aggregation and distribution of spatial data on different themes on a common defined set of standards and formats by different mapping agencies in India. This infrastructure of data will provide metadata of all the data available with various participating agencies and facilitate users to obtain data as per requirements with a simple and smooth procedure from a common platform.

### ***Need for NSDI***

- ❖ To Enable the establishment of a national repository of a digital 'ware-house" of the national map data holdings.
- ❖ To facilitate Sharing and access to the digital spatial information.
- ❖ Building relationship among data generating agencies to support continuous development of NSDI.

Looking at the various aspects of spatial data, the, industry can provide services to various organizations in the following areas.

- ❖ Creation of Metadata for NSDI node.
- ❖ Assisting each organization to create their own metadata for posting on the NSOI node.
- ❖ By providing Web map services at NSDI node and the servers of each participating agency.
- ❖ e-security / e-commerce Services.
- ❖ Providing services for customizing application for easy web interface.
- ❖ Interoperability between different GIS platforms, displayed within a participating agency and at the user end.

## **02. Services for Creation of Metadata**

Metadata is the term that describes the summary information about "data-on- data". Metadata helps people who use geospatial data in finding the data they need like information about the publisher of the map, type of map and attribute information, description of the map. Its scale and many other information and determine how best to use it. Metadata helps prospective users in browsing / selecting data required for their specific application / projects.

After the metadata search, the next step is to communicate with the participating agency concerned like Survey of India (for topographical data), Forest Survey of Indian (for forest data), CWC (for hydrology data), GSI (for Geological data) and so forth. The communication needs to adhere to security norms of e-commerce. The actual data is to be ordered from a participating agency. The ultimate test of the success of a data product delivery service is that its contents are found and utilized for discrete and meaningful business purposes. In order to do this, the Industry needs to provide services



to various participating agencies in creating and managing their metadata and provide a mechanism for detailed browsing to the prospective user, so that the extent of coverage of available data for the, areas of interest is well understood by the User.

### **03. Web based GIS I Mapping Services**

Web based GIS is a visualization and analysis tool that provide real time links to GIS data warehouses. This enables a user to perform GIS queries without any GIS software / data on their individual machines. With simple interfaces, the User can navigate large quantities of information enabling user to access and analyze data anytime and anywhere instantly. The intention of web mapping is to portray spatial information quickly and easily for most users.

In addition, Web GIS enables a user to view either vector or raster data, or a combination of both. G'IS data repository needs to be maintained up-to-date so that the user can view current information, and industry tools can be made available to update the GIS data warehouse.

#### **Interoperability:**

Interoperability is designed to use open standards through support of organizations desiring to build web service using OGC standards as well as organization wishing to publish their data in XMLI GML file format.

Interoperability capabilities at NSDI participating agencies will enables all / departments to share data via central data repository while continuing to use their existing application. With the database at a central location, different departments within the organization can use different applications to create the data. The following are the benefits.

- ❖ **Increasing data accessibility** - when data is stored in an enterprise database, all users have easy access to the most accurate and up to date data.
- ❖ **Increasing data security** - by storing spatial data in any RDBMS (Relational database management system) various department can realize the full benefits of secure and high quality data.
- ❖ **Increasing productivity** - eliminate the time wasted to convert / translate data.
- ❖ **Supporting multiple application** - each department can Use its preferred software and data types, while working from a shared enterprise database.
- ❖ **Improving Communications** -an enterprise system enables all system to communicate quickly and effectively, regardless of data format.

Interoperability is now, also addressed with the emergence of Geography Markup language (GML), which is an open source standard for graphic database and stores data in text format. GML allows us to bridge the gap between different data Sources, vendors, databases and format. GML gives users the capability to easily and dynamically publish and exchange data in an Open industry standard on the web.



Services for Customization: In the past, each GIS systems have had their own proprietary customization languages for creating custom commands and applications. As the Industry evolves, a need to build solutions based on open standards is a necessity to operate within a multi environment where GIS is just a piece of the enterprise

#### **04. E- Services for NSDI Server and NSDI Agency**

Once the connection is established between the NSOI node and participating node, the security is the utmost importance and ensuring their protection will be a major endeavor of NSDI. Multi-layer protection, Firewalls and Secure ftp ports will have to be enabled for maximizing security at both the nodes. To facilitate connectivity between connected offices of NSDI tools like Firewall, VPN (Virtual Private. Network) should be used at each locations of NSDI, so that secure transactions will be possible not only between NSOI node but also at participating NSOI agencies.

Firewall & Virtual Private Network (VPN) is robust and open based solution customized for running on operating system including

- ❖ Network maximum security
- ❖ High throughput by optimizing network performance on firewall
- ❖ Low cost communication infrastructure and powerful management ability

In addition, there are additional industry e-services available including advanced server monitoring and alerting services. These services monitor a majority of popular Internet applications including basic network connectivity, web, Email along with its popular protocols. Advanced monitoring services also Covers:

- ❖ Web Server performance enhancement services
- ❖ Security form Remote connections
- ❖ Network Intrusion Detection system
- ❖ Basic Network communication
- ❖ Virtual Private network (VPN) tunnel between participating agencies and NSOI node should provide encrypted communication. Only two nodes will view data meant for each other.
- ❖ Virus scanning and filtering to ensure security of traffic account.

#### **05. E-Commerce:**

As industry is moving ahead, smart card / on line shopping can be used to identify and authenticate services online, while ensuring confidentiality of each User.

In case a user needs to purchases data from the participating agencies, services can be made available at various levels to NSOI agencies ranging from one-time setup to-day-to maintenance and thereby allowing the user to get the data in desired format.

#### **06. Conclusion:**



Scope of services is enormous, in helping the National Spatial Data Infrastructure node and participating agencies to gain: maximum benefit by having a centralized repository of metadata and to utilize database irrespective of format and platform. High-end software with faster access speed will be an important aspect in performing quick and effective decision-making. Periodic updating .of metadata and GIS data by participating agencies are mandatory to generate maximum benefits.