DESIGN AND IMPLEMENTATION OF INFORMATION SHARING PLATFORM OF LAND AND RESOURCES

Zongxiang Zha [a], Wenjue Jia[a]

[a] Information Centre of Ministry of Land and Resources P.R.C zxzha@infomail.mlr.gov.cn wjjia@infomail.mlr.gov.cn

Commission VII, WG VII/5

KEY WORDS: Land and Resources, Information Sharing, Platform

ABSTRACT:

With the development of land and resources informatization, huge amounts of information resources has accumulated, but data between different departments is hard to share and utilize, the unitary effect can not be realized. To improve the ability of decision-making for the management of Land and resources and to satisfy a variety of requirement of information of land and resources from different departments and the public，it is urgent to build a information sharing platform of land and resources based on the network. This paper introduces the architecture, the main content and the evolution and prospect of the project of the information sharing platform of Land and Resources.

1. INTRODUCTION

Information of Land and Resources includes Land information, geology and mineral resources information, Ocean information and Survey and mapping information, which are distributed in different institutions and organizations. Increasing numbers of Information of Land and Resources has accumulated with the development of land and resources informatization in recent years, but due to organizational and technological barriers, data between different departments is hard to share and utilize, the unitary effect can not be realized.

Information sharing of Land and Resources need to be better addressed to Land and Resources management, relevant industry and public users. Decisions making of the government usually involve a vast range of sectoral institutions and organizations at various administrative levels with different systems and services. Relevant industry and public also need getting information of Land and Resources to combine analysis with their own data and to avoid repeated producing data. Unfortunately, exchange of relevant information needed for Information of Land and Resources is often limited to a raw data exchange level and true efficiency, in most cases, is hindered by administrative and legal boundaries as well as a lack of interoperability on the technical side.

In an attempt to solve some of these problems, the Information centre of Ministry of Land and Resources P.R.C has made "Integration and sharing platform of Information of Land and Resources" one of its strategic objectives of the Digital Land project. The information sharing platform project is the projects that recently started in this area. The main goal of project is to design and implement an open service oriented software architecture and to provide some data sharing services that will improve the information sharing of Land and Resources.

In order to realize this goal, the key objectives for the project are the following:

- To design an open service-oriented architecture for distributed data sharing of information of Land and Resources

- Data sharing services. In this context the project will provide five data sharing services, including metadata catalogue service, metadata catalogue service system, spatial data sharing service system based on gridmap technology, spatial data sharing service system based on WebGIS technology, non-spatial data sharing service system and data apply and approve service system, the five data sharing services get together to satisfy various users requirement of information of Land and Resources.
- To develop Data planning and data processing, this works out the plan of the data sharing services and prepares the data needed for the data sharing services.
- Information sharing management specification and operational mechanism, which sets up the management mechanism and standards to standardization the construction and the operation of the platform.
- Setting up Software and hardware environment, which provides the software and hardware required by the information sharing platform of land and resources.

The project started in 2006. Currently the focus of the work is on understanding user needs, data planning and standardization, system requirements, an assessment of useful technologies and developing data sharing services system for spatial data. One of the designed five data sharing systems has been successfully developed and widely used in the intranet of Ministry of Land and Resources P.R.C. In the following we will first explain the architecture, the data sharing services and the key technology of the project.

2. ARCHITECTURE AND MAIN CONTENT

The information sharing platform of land and resources has one information service centre and four professional data management centre: Land data management centre, Geology and mineral resources data management centre, Ocean data management centre and Survey and mapping data management centre. See figure 1.
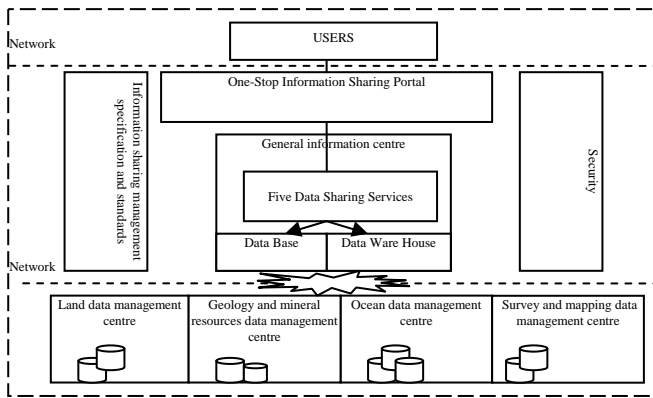
Figure 1 the architecture of Information Sharing Platform of Land and Resource P.R.C

The Information service centre deployed at Information Centre of Ministry of Land and Resources P.R.C. which is the core of the sharing platform. All the five data sharing services are deployed in this centre and a One-Stop information sharing portal upon on the services deploy in this centre too. The One-Stop information sharing portal is the only entrance of the information sharing platform which provides the uniform entrance of the five service systems. Through the website, users can enjoy the one step login, convenient data searching, powerful service function, service and data navigation, and theme data classification service and so on. The centre database and data ware house deployed at the information service centre too. The data ware house based on the centre database and the databases from four professional data centres which aim at high level decision-making for the management of land and resources.

Land data management centre deployed at China Land Surveying and Planning which take charge of preparing, processing, maintaining, updating land resources related sharing data for the five data sharing services according data plan and data sharing standards and specifications.

Geology and mineral resources data management centre deployed at China Geological Survey which take charge of preparing, processing, maintaining, updating Geology and mineral resources related sharing data for the five data sharing services according data plan and data sharing standards and specifications.

Ocean data management centre deployed at State Oceanic Administration P.R.C which take charge of preparing, processing, maintaining, updating Ocean resources related sharing data for the five data sharing services according data plan and data sharing standards and specifications.

Survey and mapping data management centre deployed at State Bureau of Surveying and Mapping which take charge of preparing, processing, maintaining, updating survey and mapping related sharing data for the five data sharing services according data plan and data sharing standards and specifications.

3. DATA SHARING SERVICES

The five Data sharing service systems, which are the core of the information sharing platform, including metadata catalogue

service system, spatial data sharing service system based on gridmap technology, spatial data sharing service system based on WebGIS technology, non-spatial data sharing service system and data apply and approve service system. The five service systems aim at different user requirements. The relationship of the five data sharing services see figure 2.
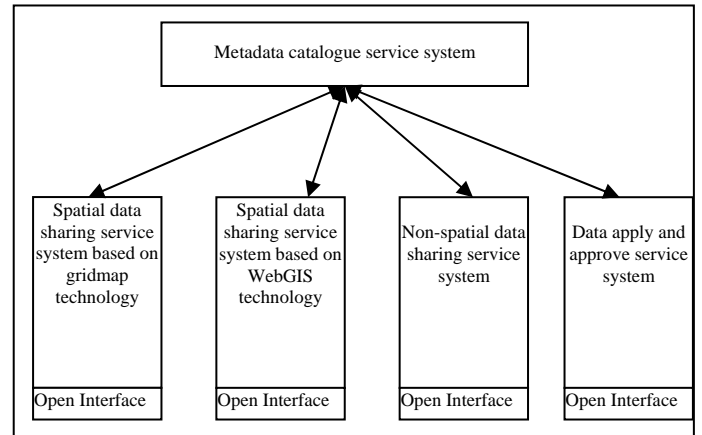

Figure 2 The relationship of the five data sharing services

The metadata catalogue service system which aims at data searching and finding, through this service, Users can search and find the metadata of the interested data and can navigate to other service systems if the interested data is served by the other services systems.

Spatial data sharing service system based on gridmap technology satisfy the quick browsing need of spatial data of users in the net environment which use the technical like Google Earth, the biggest strongpoint of this service system is the short response time of spatial data in the Internet due to the data pre-making mechanism.

The spatial data sharing service system based on WebGIS technology is another data sharing services system for spatial data. The spatial data sharing service system based on WebGIS technology aims at users who want to do some spatial analysis on line or want to download the spatial data on line. This services system fully using the WebGIS technology and can provide rich GIS spatial analyses function but due to the huge mount of the spatial data transformations; the response time of this service is long in the Internet. Spatial data sharing service system based on gridmap technology and The spatial data sharing service system based on WebGIS together can satisfy various user need for spatial data.

The non-spatial data sharing service system which providing non-spatial data service of land and resources. Besides spatial data, there are plenty of none-spatial data of Land and resources such as documents, tables, images and videos and so on. The non-spatial data sharing service system provide users a convenient way to search and find non-spatial data of Land and resources online.

The data apply and approve e service system which providing a means for user to get the off line secret data. Part of data of Land and Resources are keep secret thus can not been transfer through the Internet, if users want to get this kind of data, usually they should go to the data keeper and provide the

required certificates. After examine and approve, then user get the data. The data apply and approve e service system can simplify most of the procedure and users can submit the certificates through the net.

The five service systems are not isolated; they can navigate from one service system to the other service system if the interested data are served by more than two service systems through open interoperability interfaces. Using these interfaces, not only the five service systems can invoke each other, but also the other e-government systems can invoke and sharing the data provided by the information sharing platform. User can first search the metadata of the interested data and get the data detail information and service information through the metadata. If the data also be served by the Spatial data sharing service system based on gridmap technology or the Spatial data sharing service system based on WebGIS, they can navigate to the service directly through the metadata service and enjoy the function provide by that service. Vice versa, users also can navigate through other service system to the Metadata service systems. The five systems get together can satisfy variety of demand of the information of land and resources.

4. CONCLUSION

The information sharing platform of Land and Resources implementation now is ongoing. The final aim of the information sharing platform of Land and Resources is realize unify data sharing of Land data, geology and mineral resources data, ocean data, survey and mapping data which dispersed in distributed departments and firstly realize unify Land and resources information data sharing, Which aims at across departments of land and resources.

The open architecture of information sharing platform of Land and Resources ensure the sharing platform not only satisfy the data sharing requirement among Land and Resource system, but also can be invoked and shared by other application systems of outer domain. The final aim of the information sharing platform is to lets every one, very system and every service that need information of Land and Resources can get and enjoy the information easily.

REFERENCES

Gong Jianya, Xu Feng, Wu Huayi, Li Haochuan, Xie Jibo , 2005. Multi-level Heterogeneous System and Key Technologies of Land and Resources Information Exchange System. Land and Resources Informatization, pp. 22-25.

Wenjue Jia, Zhou zhou, 2007. Geospatial Data Sharing Models of Land and Resources. Land and Resources Informatization, pp. 24-31.

Gong Jianya, JIA Wenjue, CHEN Yumin, XIE Jibo, 2004, Development from Platform GIS to Cross-Platform Interoperable GIS, Geomatics and Information Science of Wuhan University, pp. 985-989.

Alessandro Annoni, Orchestra: Open Architecture and Spatial Data Infrastructure for Risk Management, (http://www.eu-orchestra.org/docs/Paper_Hannover_Orchestra.pdf)

ISO 19115 The OpenGIS Service Architecture, 2001