

Indonesian Geospatial Data Clearinghouse

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Key words: geospatial data clearinghouse.

SUMMARY

In compliance to the recommendations resulted in the Indonesian Spatial Data Infrastructures (ISDI) Coordination Meeting last year, Indonesia, under the initiative and leadership of the National Coordinating Agency for Surveys and Mapping of Indonesian (BAKOSURTANAL) starts developing the National Geospatial Data Clearinghouse.

It is understood that the development of clearinghouse is a complex one that needs involvement of all geospatial data in the country and integration to the global metadata system.

To cope with this complexity, the clearinghouse will developed in stages. The first year of development then will be focused on the conceptual model development and in parallel to this is the development of clearinghouse prototype.

This paper will describe the development of the National Geospatial Data Clearinghouse in terms of conceptual model and prototype development which both are being implemented and as well as the problems encountered and the future development. The prototype consists of data directory development, metadata development, and z39.50 protocol application.

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1. BACKGROUND INFORMATION

In globalization era, which open access to information becomes an issue to all nations, Indonesia as a member of a global community is determined to make all information available in the country open for public. The government insists on all government institutions to put into practice good governance in order to give better service to public, including service of public information that is kept by the government.

In the context of geospatial information, which most of them are produced by the government institutions, the government requires that all geospatial data producers deliver the geospatial information they produce to geospatial data users.

For this purpose a national initiative led by the National Coordinating Agency for Surveys and Mapping of Indonesia (NCASM), a government institution, decides to develop a National Geospatial Data Clearinghouse.

The development of the National Geospatial Data Clearinghouse is understood to be a long and complex process because it involves a very large number of geospatial dataset, many data producer institutions in the country and a number of professionals.

2. NATIONAL GEOSPATIAL DATA CLEARINGHOUSE OF INDONESIA

Clearinghouse is known to be a distributed database server system connecting data producer, data user and manager that can be accessed through the internet. A clearinghouse is considered by many as a useful tool to search, find, evaluate and obtain any kind of data.

The National Geospatial Data Clearinghouse is a clearinghouse that deals with geospatial databases produced and used within the territory of Indonesia. The development of National Geospatial Data Clearinghouse involves all geospatial data stakeholders in Indonesia.

2.1 Content

The content of the National Geospatial Data Clearinghouse is information about all sets of geospatial data existed in Indonesia. Information about data is known as metadata. Because this data deals with geospatial data then this metadata is called as geospatial metadata. Metadata required by the National Geospatial Data Clearinghouse consists of organization metadata, collection metadata and inventory metadata.

Organization metadata is metadata that consists of information about the data producer organization. Collection metadata is metadata that contains information about a collection of

data. And finally the inventory metadata is metadata that refers to information about all collection data in detail.

To develop metadata for the National Geospatial Data Clearinghouse, a content standard of metadata is necessary. Indonesia, in this case, has decided to adopt the Federal Geographic Data Committee metadata standard called '*Content Standard for Digital Geospatial Metadata*', *FGDC-STD-001-1998* as the national content standard of metadata. This adoption means that all data producers in Indonesia have to use this standard in developing their geospatial metadata.

To implement this standard, Indonesia has been developing an application to generate the geospatial metadata information and present it on the web. The application is using bahasa Indonesia and is called the MDSN

2.2 Technology

The National Geospatial Data Clearinghouse consists of a number of metadata servers that are interconnected forming a network. These metadata servers belong to data producer organizations and are called network nodes. Within this network, there is an additional server that is operated as a network gateway that allows connections to other networks. This server is called metadata gateway server.

This network is developed on the TCP/IP protocol and is connected to the internet. The connection to the internet is considered so that all metadata servers that are located in all parts of Indonesia can be connected into the network and all metadata users can access the network from internet.

Metadata server consists of metadata server applications that are designed to generate metadata database and transmits the server to the internet. This metadata database is generated using Geo Profile as a reference of technical specification of metadata standard with Z39.50 protocol. The type of metadata information that was stored on the server is a collection metadata and or an inventory metadata. This metadata server should be developed and maintained by any institution that produces the geospatial data.

The metadata gateway server contains the registry of all node servers belong to this clearinghouse network system. In addition, this server also has the information of institution's metadata servers who register their servers.

Besides, this gateway server consists of internet based applications that are designed to search and retrieve metadata information that was stored in metadata database on the node servers. This "Search Engine" is developed using Z39.50 protocol. Users can access metadata information on the node server through metadata gateway server on the internet.

In relation to this concept, Indonesia has been developing an application to implement this metadata gateway which is called the DDSN.

The database system adopted by the National Geospatial Data Clearinghouse is a distributed database system. All data producer should develop geospatial metadata databases under their responsibility. Each metadata database will be collected, stored and maintained in each data producer.

The development of the geospatial metadata in each data producer should ensure that this comply with the content metadata standard adopted by the National Geospatial Data Clearinghouse.

The use of protocol Z39.50 allows the National Geospatial Data Clearinghouse to be promoted into the world metadata community networks by making links to the regional and global clearinghouse. In addition, this protocol allows the implementation of the distributed database system.

In this case the National Geospatial Data Clearinghouse will be linked to the regional network called the Asia Pacific Spatial Data Infrastructure (APSDI), and to the global network called the Global Spatial Data Infrastructure (GSDI) in which Indonesia is a member. The National Geospatial Data Clearinghouse then becomes an integrated national node to APSDI and GSDI clearinghouses.

2.3 Management

In principle, the National Geospatial Data Clearinghouse is managed by the stakeholders consisting of all geospatial data producers and users in Indonesia. The management of the National Geospatial Data Clearinghouse is implemented through the three organizations established for this purpose. These organizations are established by the stakeholders. These organizations consist of the Permanent Committee, National Metadata Gateway and the Geospatial Metadata Centers.

The Permanent Committee deals with activities in directing, administering controlling, and monitoring the existence of the National Geospatial Data Clearinghouse. The National Metadata Gateway is an inter-institution body that is established to develop, maintain and operate the National Metadata Gateway. The Geospatial Metadata Centers are a unit in data producer institutions that is established to develop, maintain and operate a metadata server within each institution.

2.4 Policy

The National Geospatial Data Clearinghouse will be served as a metadata gateway for all geospatial metadata produced in Indonesia. This means that all metadata users can only access Indonesian geospatial metadata through this National Geospatial Data Clearinghouse.

To improve service for the global users, the National Geospatial Data Clearinghouse will be linked to the APSDI and GSDI clearinghouses and become an integrated node of these clearinghouses.

The nodes of the National Geospatial Data Clearinghouse network consist of central, provincial, local institutions nodes and they are all called as Geospatial Metadata Centers.

3. PRESENT CONDITIONS

The development of the National Geospatial Data Clearinghouse is not without problems although there are some conditions that support the development. The problems dealing with the development consists of:

- Little understanding of the use of clearinghouse within the provincial and local government. This understanding is necessary because the development of the National Clearinghouse will be funded by all governments in Indonesia including the central, provincial and local governments.
- The existence of geospatial metadata in almost all of data producer institutions is inappropriate.
- At present, only few of the node institutions have developed the metadata servers and databases.
- The quantity and quality of human resources available in node institutions are inadequate.

The conditions that are considered supporting the development of the National Geospatial Data Clearinghouse are as follows:

- There is a strong supports from central government and data producer institutions all over the country.
- There is a large number of geospatial data available in the country.
- Institutions consist of National Coordinating Agency for Surveys and Mapping, Center for Soil and Agro-climatic Research and Center of Data and Information of Department of Regional Settlement and Infrastructures already developed their metadata.
- National Spatial Data Directory (DDSN)
- National Spatial Metadata (MDSN)

4. DEVELOPMENT PROGRAM

The development of the National Geospatial Data Clearinghouse is implemented in a program as follows:

ACTIVITIES/YEAR	'02	'03	'04	'05	'06	'07	'08	'09
Development of MDSN metadata application	==							
Metadata Development Guide		==	==	==				
Development of DDSN system model		==						
Socialization			==	==	==	==		
Development of National Geospatial Data Clearinghouse (NGSC) website			==					
Development of gateway system			==	==				
Development of NGSC nodes				==	==	==	==	==

ACTIVITIES/YEAR	'02	'03	'04	'05	'06	'07	'08	'09
Development of NGSC node metadata database				==	==	==	==	==

BIOGRAPHICAL NOTES

Dr. Puntodewo.

Age 51.

Agency : National Coordinating Agency for Surveys and Mapping Indonesia

Position : Head of Networks System and Spatial Data Standardization Center

Education Background :

- Engineer Degree from Bandung Institute of Technology Bandung Indonesia
- Master Degree from University of New South Wales, Australia
- PhD from Bandung Institute of Technology Bandung Indonesia

Organization experience :

- Actively Involved in the development of Indonesian Spatial Data Infrastructure as a Steering Committee Member of NSDI Forum.
- Participant for the Permanent Committee on GIS of the Asia and the Pacific.
- Member of Information System Working Group for Land Management and Policy Development Program, National Land Agency.

Radjiman Nataprawira.

Age 49.

Agency : National Coordinating Agency for Surveys and Mapping Indonesia

Position : Head of Metadata Section

Education Background:

- Doctorandus Degree from University of Padjadjaran Bandung Indonesia

Organization Experience:

- Actively involved in the development of Indonesian Spatial Data Infrastructure as a member of NSDI Forum.
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