EXPLORING AND SHARING GEOSPATIAL INFORMATION THROUGH MYGDI EXPLORER

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Abstract

Malaysian Geospatial Data Infrastructure(MyGDI) is a national program to develop the geospatial data infrastructure in Malaysia to promote the sharing of geospatial information throughout Malaysia. This program is lead by the Malaysian Centre For Geospatial Data Infrastructure under the Ministry of Natural Resources and Environment. MyGDI components consists of governance, policy, standard, resources, research and development, geospatial information, services and access mechanism. Through this components, infrastructure is developed to enable various geospatial providers to develop and share their geospatial information.

One of the initiative that was developed under the MyGDI program was the MyGDI Metadata Catalogue or also known as MyGDI Explorer. MyGDI Explorer is a metadata catalogue that enables users and geospatial data providers to share, access, discover and publish geospatial information online. Users can access and discover geospatial information by reading the metadata or accessing the map services provided. Data providers can publish and share information on the geospatial data or product that have developed without any cost. Some of the benefits of this application is enabling easier access to geospatial information, saves time in acquiring geospatial information that is needed for a project or analysis, promotes the existence and usage of geospatial information and avoid in the duplication of geospatial data collection among agencies in Malaysia.

This paper will explain on the functions and capabilities that is provided in the MyGDI Explorer. Among the functions are search , access to online map services or web services, metadata entry, upload , harvesting and verifying methods and map viewer to view services.

Keywords : MyGDI , MyGDI Explorer , geospatial information

Introduction

A spatial data infrastructure (SDI) is a data infrastructure implementing a framework of geographic data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way. A SDI should enable the discovery and delivery of spatial data from a data repository, via a spatial service provider, to a user. To achieve this, a catalogue service is developed for the discovery, browsing and querying metadata or spatial services, spatial datasets and other resources.

In recent years, Spatial Data Infrastructures are being developed in many countries around the world and under this initiative a catalogue service is developed enable the discovery and delivery of spatial data to users. Below are some of Spatial Data Infrastructures around the world and the catalogue service developed:

i. US Spatial Data Infrastructure – Geodata
ii. Australian Spatial Data Infrastructure (ASDI) – Australian Spatial Data Directory
iii. Canadian Geospatial Data Infrastructure (CGDI) – Geoconnections
iv. Finnish Geospatial Data Infrastructure - Paikkatietoikkuna
v. Spanish Spatial Data Infrastructure - Metadatos

In Malaysia, the spatial data infrastructure was developed in 2002 and is known as Malaysian Geospatial Data Infrastructure (MyGDI) and the catalogue service developed was MyGDI Explorer. MyGDI Explorer or MyGDI Metadata Catalogue is single access catalogue for users from the government, private, public and the education sector to acquire geospatial information online. This application enables users to search, locate, share and publish geospatial information online. Geospatial information that be shared in this catalogue are any application, document, data, services and plans related to geospatial.

MyGDI Explorer was developed to enable the sharing of geospatial information online, promotion of geospatial information, avoid duplication in data collection and saves time in acquiring geospatial information. This application was developed in 2005 and enhanced according to user requirements from time to time. The MyGDI Explore uses the GIS Portal Toolkit 9.3.1 to build the user interface and catalogue, , ArcGIS Server Enterprise Standard 10 to publish map service , Novell Identity Manager 3.5 to store user information and MS SQL Server 2008 to manage and store the metadata.

There are a lot of features in MyGDI Explorer that was developed to suit the needs of users and data publishers. Some of the special features are the metadata search function, access to map or web services, metadata updating and validation , MS ISO 19115 and 19119 based metadata template and map viewer.

1. Metadata Search and Result

The MyGDI Explorer provides a few options to search geospatial information. Users can use keyword, envelope search, content type, modified data, data category (refer to ISO 19115) or look for the information through other GIS portals. Figure 1 shows the available options for search.

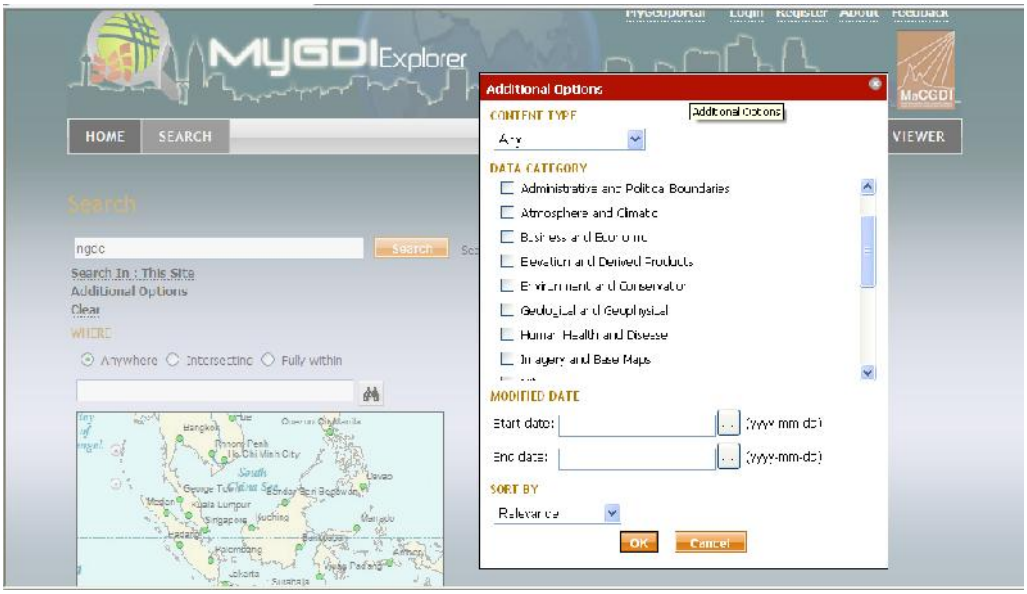

Figure 1 : Search Function

Search can provide the information that the user requires in a form of metadata details, xml format and map service. Metadata Details shows information on the abstract, format, data provider, policy, distribution, coordinate system and other related information in a template and xml format. To visualize and support the metadata, users can view the data in a form of map service Figure 2 displays the information of metadata in xml and map service.

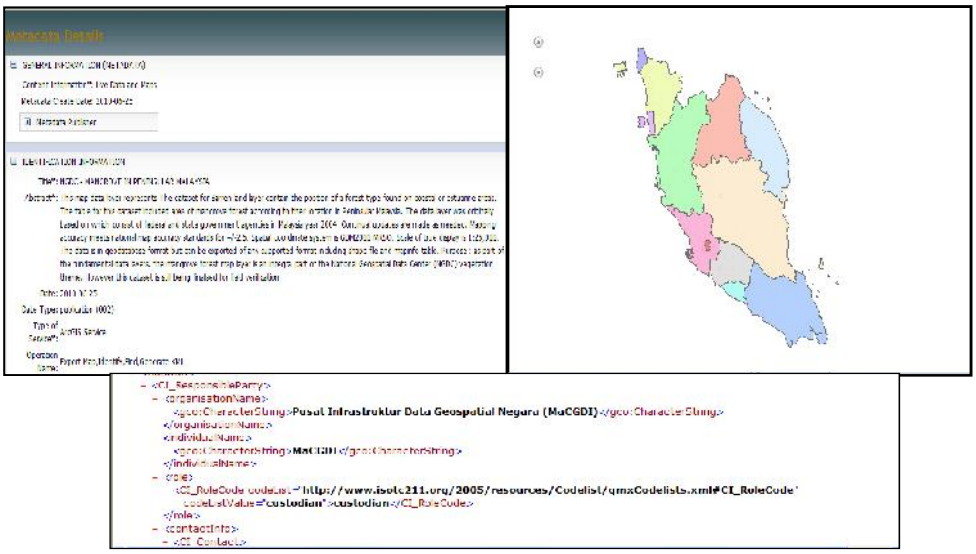

Figure 2 : Metadata Details , Map Service and XML Format

2. Access to Map Service

One of the special features in exploring geospatial data through MyGDI Explorer is the capability to view map services. User can not only view the map services online but can also access the maps in GIS software like ArcMap version 10, Map Info version 10, Quantum GIS, GAIA, Autodesk Map Guide and other Open Geospatial Consortium (OGC) compliant GIS software or tools. Other than than, users can also overlay the map service in Google Earth and ArcGIS Explorer to perform analysis and visualize the data better. This helps users to access geospatial data anytime using MyGDI Explorer and don't need to acquire the physical form of the data which requires some time. All this can be done as long as the users have access to the internet. Figure 3 shows a map service displayed in ArcMap 10 and Google Earth.

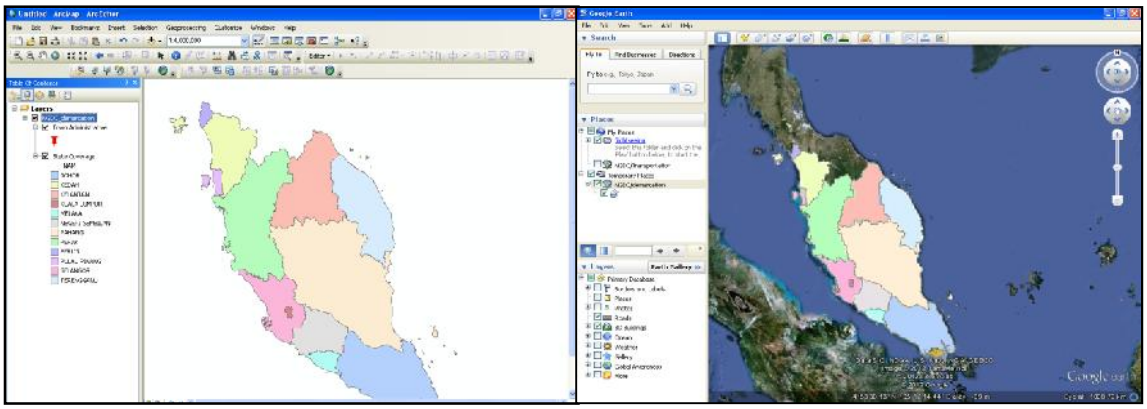

Figure 3 : Map Service in ArcMap and Google Earth

3. Metadata Entry, Upload and Validation

Metadata is information about a data or product. Through metadata can share and gain information. In MyGDI Explorer, metadata that can be shared are information on data, map or web service, document, project or any activities related to geospatial. Metadata entry through this application has been simplified to suit user needs. It refers to the MyGDI Metadata Standard (MMS) which is based on the MS ISO 19115/19139 for dataset and MS ISO 19119/19139 for web service. Metadata entry can be done by any users who own , develop or collect geospatial information. Users need to register themselves as data publisher before they can share and enter their metadata information using the template developed. Metadata that has been entered will be checked by the administrators or approvers before it is published in MyGDI Explorer. After publication, users can search acquire the metadata information online at any time. Figure 4 shows the template for metadata editor.

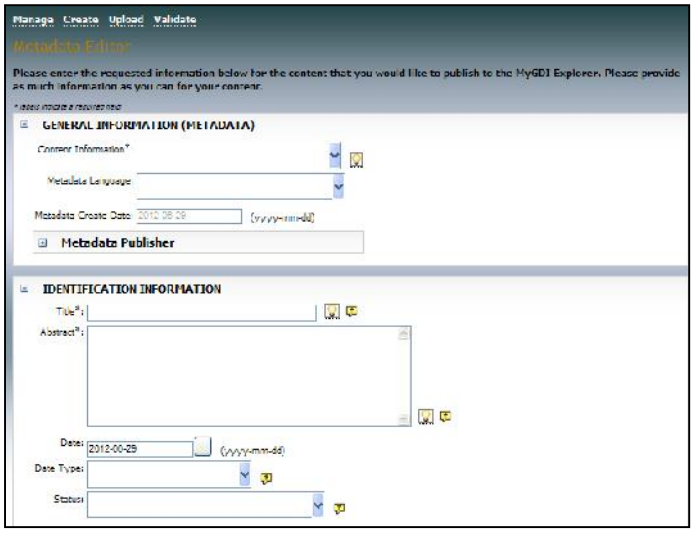

Figure 4 : Template Metadata Editor

Other than developing a template for metadata entry, users can use the upload function to upload metadata information in Extended Markup Language (XML) as shown is Figure 5. Some GIS software like ArcCatalog provides tools to enter metadata for dataset that is created using the software. The metadata is saved in a XML format and can be uploaded MyGDI Explorer. However the metadata needs to be validated using Metadata Editor Offline (METAFOR) which is tool that complies to MyGDI Metadata Standard as shown in Figure 6. It can be downloaded form the MyGDI Explorer website. This tool can be used to enter, validate and correct the metadata in XML format before it is uploaded into MyGDI Explorer. This tool is developed for those users without internet connection and to promote the use of MyGDI Metadata Standard (MMS) in the sharing of geospatial information.

Figure 5 : Upload Module for XML

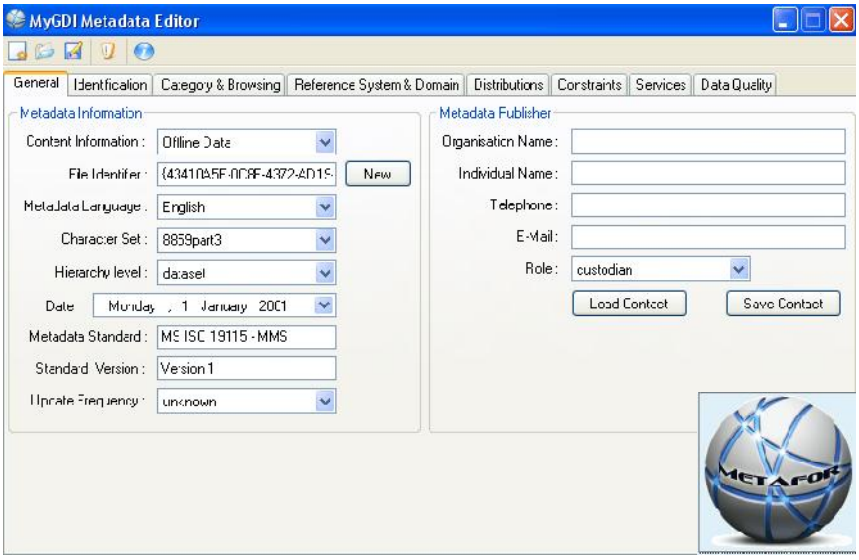

Figure 6 : Metadata Editor Offline (METAFOR)

4. Map Viewer

To visualize data and make simple search , the map viewer was developed . The map viewer is also known as MyGDIX Viewer and ArcGIS for Flex was used to develop the overall viewer and interface. This interactive viewer helps users to search and browse for data and metadata in a single viewer. Users don't need GIS or third party software to view the maps. Users can also add map services from ArcGIS 9.3, ArcIMS or WMS Service to visualize and analyze their data. A few data such as the fundamental dataset for national (NGDC) , Quickbird and SPOT 5 data have been published in this viewer. Currently this viewer can be accessed without restrictions. Figure 7 show the interface of the MyGDIX Viewer.

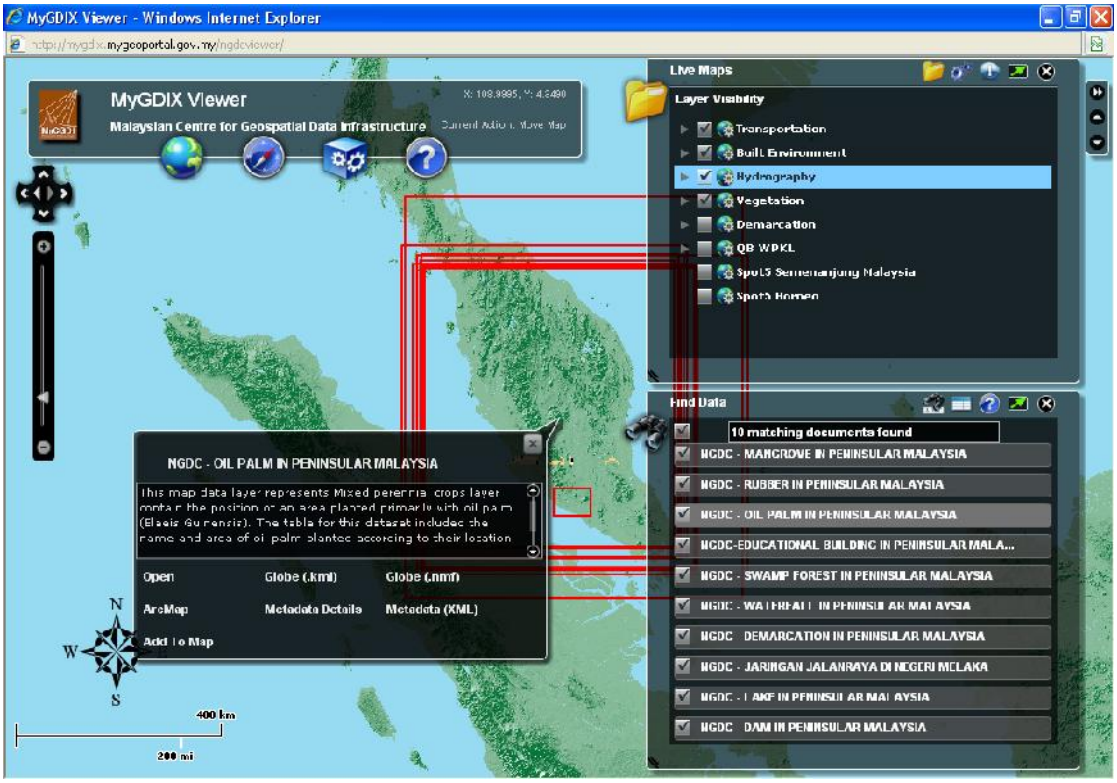

Figure 7 : MyGDIX Viewer

Conclusion

Currently MaCGDI is working on the migration of ESRI GIS Portal Toolkit 9.3.1 to Geoportal Server 1.2 . The Geoportal Server 1.2 is an open source version and can save a lot of cost in term of license and development cost. To promote the sharing of map services or web services online, MaCGDI is also studying on the development of security module to control and secure access to map services. By sharing map services or web services online, users don't need to get the physical data from the data provider and save time in acquiring information.

The MyGDI Explorer gets about 20 visits per day in average. There about 2504 metadata shared or published in MyGDI Explorer to date. However, this number has not met with MaCGDI's vision to create a geospatial enables nation. There a few issues in the implementation of MyGDI Explorer. The major issues are lack of understanding the importance of sharing geospatial information (metadata), data restrictions and policies involved in data sharing, metadata is technical, data not updated, budget constraint and network issues. MaCGDI is looking into solving by drafting the Geospatial Data Act , organizing more outreach programmes, building partnership with the private and higher institutions and seeking budget to upgrade the ICT infrastructure in Malaysia. By doing this, MaCGDI hopes that one day, MyGDI Explorer will be a one stop portal to search, acquire and share geospatial information online for the users in Malaysia .