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C5.158 Integration of Open OGC services, INSPIRE objectives and WP5 components in Geoplatform

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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

This report describes the integration of Open OGC services, INSPIRE objectives and Work Package 5 (WP5) components in the EDIT Geoplatform tools. It was compiled by Marcin Gašior with a generous input from Patricia Mergen, James Davy and Franck Theeten and the colleagues from the EDIT developer mailing list.

Introduction

The EDIT Geographical platform components were established under the Work Package 5 – ‘Internet Platform for Cybertaxonomy: Tools, Sharing, Networking and Integration’. The idea behind it is to provide an integrated framework for all users of taxonomy. There are two geographic tools being developed under Work Package 5.4: the EDIT MapViewer and the EDIT Map REST Service. The EDIT mapViewer is meant to be an easy to use online mapping tool for taxonomists working with their own data. The EDIT map REST service was designed to provide means for automated access map generation. It exposes a rich API based on HTTP parameters enabling users to take a full advantage of available functionality.

The European Union recommends that geospatial components implemented in EU projects follow INSPIRE and OGC standards and guidelines. Therefore it is important to discuss and assess how the EDIT Geoplatform fulfils this recommendation. However, as the Geoplatform does not make available or share spatial data as such (it only pictures the user provided spatial data), the description is limited to the services provided. What is important, the EDIT programme recommends also the user driven data to follow the standards (TDWG, OGC, INSPIRE).

Open OGC services

The Open Geospatial Consortium (OGC) is the leading standards organisation in the geospatial arena. OGC Web Services (OWS) are based on client-server architecture model. An implementation of OWS comes down to usage of HTTP protocol as a transport layer conveying client’s requests and server’s answers in a XML document form (available at: <http://www.opengeospatial.org/standards/common>).

OGC specifications define dictionary and syntax of commands/operations which enable communication between client and server through HTTP protocol with GET and POST methods. Those specifications can be treated as an API (Application Programming Interface) which allows the creation of web services used by various applications without going into service implementation details. The most important specification from the EDIT Geoplatform point of view is the Web Map Service (WMS) which defines a standard protocol for generating cartographic maps in a specific coordinate system in a raster image form over the web (available at: <http://www.opengeospatial.org/standards/wms>).

The software and technologies used to develop and operate the EDIT geographical components in large measure decide if the standards are complied. If the software follows the standard, the service based on it would also be standard compliant. Below the software used is described.

PostGIS adds support for geographic objects to the PostgreSQL object-relational database. In effect, a data which has spatial reference (points, lines, polygons) can be stored seamlessly in the PostgreSQL database. PostGIS follows the OGC "Simple feature access - Part 2: SQL option" specification (available at: <http://www.opengeospatial.org/standards/sfs>). Moreover, it has been certified as compliant with the “Types and Functions” profile.

GeoServer is an open source software server that allows users to share and edit geospatial data. It publishes data from any major spatial data source using open standards. GeoServer is the reference implementation of the OGC Web Feature Service (WFS) and Web Coverage Service (WCS) standards, as well as a high performance certified compliant Web Map Service (WMS). GeoServer is the only open source server that has successfully passed both the WMS and WFS test suites which are part of OGC Compliance, Interoperability, Testing and Evaluation (CITE) project.

OpenLayers is an open source JavaScript library for displaying map data (map tiles and markers loaded from any source) in web browsers. It provides an API for building rich web-based geographic applications. Developed as the OSGeo Foundation project, it implements industry-standard methods for geographic data access – OGC WMS and WFS specifications.

INSPIRE

INSPIRE is a Directive proposed by the European Commission in July 2004 which defines the legal framework for the establishment and operation of an Infrastructure for Spatial Information in Europe. The components of the infrastructure are: metadata, spatial data themes, network services and technologies; agreements on data sharing, access and use; coordination and monitoring mechanisms, processes and procedures.

The most important components for the EDIT Geoplatform are network services and technologies, as it does not provide spatial data but only displays user data. Therefore EDIT services can be classified as a View Services type, determined in article 11 of the Directive. The minimum requirements established in INSPIRE – “View Services making it possible to display, navigate, zoom in/out, pan or overlay viewable spatial data sets and to display legend information and any relevant content of metadata” – are fulfilled except for metadata. The EDIT services provide only a description of usage but not metadata in the form expected by the Directive.

INSPIRE features 3 annexes, the first one focusing on cadastral and administrative data, place names, addresses but also hydrography and protected areas. The specification of this 1st annex is now finished and the release of first download services is forecasted for the 15/05/2012. Landcover and elevation data are tackled by annex II whose specification will be published 15/05/2012 and other thematic layers (biogeographical regions, soils, land use, sea regions etc...) are tackled by Annex III that should be specified the last.

Some companies (such as Lat/Lon with its “Degree” WMS) are currently developing INSPIRE-compliant services that currently mostly deal with cadastral data and addresses. The technical specificity of these services is that they can handle XML data and schemas that are published by on-line resource, and not only the static copies of these schemes in databases and configuration files that are located in a single server. As INSPIRE mostly deals with European data it also recommends the ETRS89 reference systems for the storage of data.

More technical aspects of introducing the INSPIRE directive are contained in the Implementing Rules. They are based on the OGC and ISO standards, yet some technical issues are slightly different. The IR describing Network services in details are above all: ‘INSPIRE Network Services Architecture’

http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/network/D3_5_INSPIRE_NS_Architecture_v3-0.pdf

and ‘Technical Guidance to implement INSPIRE View Services’

http://inspire.jrc.ec.europa.eu/documents/Network_Services/Technical_Guidance_View_Services_v2.12.pdf.

Due to relative simplicity of the EDIT Geoplatform tools, conformance with OGC standards through implementing OGC compliant software, ensure also compliance with the INSPIRE

Directive. Representatives of the EDIT projects and/or projects using EDIT services should nonetheless follow future discussions related to the INSPIRE directive in order to ensure that the final specifications also handle reference systems other than ETRS89 for historical and/or non-European data provided by European scientific resources.

Work Package 5

The main objective of WP5 is a creation of an integrated Internet platform for all users of taxonomy “oriented toward its practical use for revisionary taxonomy, taxonomic biodiversity inventories and monitoring of taxa”. Realisation of this objective was expressed in ten activities (presented at: <http://wp5.e-taxonomy.eu/blog/2007/04/04/workplan>) which provide consistent approach to “e-taxonomy” and complement mutually.

While the EDIT mapViewer is rather independent application, the EDIT map REST service is widely integrated, especially with components that present or use taxonomic data which has spatial reference (points and areas of occurrence). Those components are: EDIT DataPortal, CATE, CDM Community Store, EDIT Desktop Taxonomic Editor but also ATBI+M portals developed under WP 7. Detailed information about map REST service integration can be found in the report: *C5.112 Map REST Services further refined and fully integrated into EDIT Platform*.

Conclusions

The purpose of all standards, specifications and guidelines is achieving interoperability – the ability for data and services from different sources to successfully interact with one another.

The EDIT Geoplatform tools achieved that interoperability as it is able to cooperate with GBIF data services, Google Maps and Yahoo data layers, as well as other WMS services.

The areas which need enhancements are metadata and web browser independence. Moreover, all the further developments and functions that are anticipated in EDIT sustainability and extension plans, should also be OGC and INSPIRE compliant.