Brokered virtual hubs for facilitating access and use of geospatial Open Data

Paolo Mazzetti (1), Miguel Latre (2), Nargess Kamali (3), Raffaella Brumana (4), Stefan Braumann (5), and Stefano Nativi (1)

(1) CNR - Istituto sull'Inquinamento Atmosferico - UOS Firenze, Italy (paolo.mazzetti@cnr.it), (2) Universidad de Zaragoza, Spain, (3) GEOkomm Verband der GeoInformationswirtschaft e. V., Germany, (4) Politecnico di Milano, Italy, (5) Luftbild Umwelt Planung GmbH, Germany

Open Data is a major trend in current information technology scenario and it is often publicised as one of the pillars of the information society in the near future. In particular, geospatial Open Data have a huge potential also for Earth Sciences, through the enablement of innovative applications and services integrating heterogeneous information. However, open does not mean usable. As it was recognized at the very beginning of the Web revolution, many different degrees of openness exist: from simple sharing in a proprietary format to advanced sharing in standard formats and including semantic information. Therefore, to fully unleash the potential of geospatial Open Data, advanced infrastructures are needed to increase the data openness degree, enhancing their usability.

In October 2014, the ENERGIC OD (European NEtwork for Redistributing Geospatial Information to user Communities - Open Data) project, funded by the European Union under the Competitiveness and Innovation framework Programme (CIP), has started.
In response to the EU call, the general objective of the project is to "facilitate the use of open (freely available) geographic data from different sources for the creation of innovative applications and services through the creation of Virtual Hubs".

The ENERGIC OD Virtual Hubs aim to facilitate the use of geospatial Open Data by lowering and possibly removing the main barriers which hampers geo-information (GI) usage by end-users and application developers. Data and services heterogeneity is recognized as one of the major barriers to Open Data (re-)use. It imposes end-users and developers to spend a lot of effort in accessing different infrastructures and harmonizing datasets. Such heterogeneity cannot be completely removed through the adoption of standard specifications for service interfaces, metadata and data models, since different infrastructures adopt different standards to answer to specific challenges and to address specific use-cases. Thus, beyond a certain extent, heterogeneity is irreducible especially in interdisciplinary contexts. ENERGIC OD Virtual Hubs address heterogeneity adopting a mediation and brokering approach: specific components (brokers) are dedicated to harmonize service interfaces, metadata and data models, enabling seamless discovery and access to heterogeneous infrastructures and datasets.

As an innovation project, ENERGIC OD integrates several existing technologies to implement Virtual Hubs as single points of access to geospatial datasets provided by new or existing platforms and infrastructures, including INSPIRE-compliant systems and Copernicus services.

A first version of the ENERGIC OD brokers has been implemented based on the GI-Suite Brokering Framework developed by CNR-IIA, and complemented with other tools under integration and development. It already enables mediated discovery and harmonized access to different geospatial Open Data sources. It is accessible by users as Software-as-a-Service through a browser. Moreover, open APIs and a Javascript library are available for application developers.

Six ENERGIC OD Virtual Hubs have been currently deployed: one at regional level (Berlin metropolitan area) and five at national-level (in France, Germany, Italy, Poland and Spain). Each Virtual Hub manager decided the deployment strategy (local infrastructure or commercial Infrastructure-as-a-Service cloud), and the list of connected Open Data sources.
The ENERGIC OD Virtual Hubs are under test and validation through the development of ten different mobile and Web applications.