OPEN LINKED DATA FOR ENVIRONMENTAL PROTECTION IN SMART REGIONS – THE NEW CHALLENGE FOR THE USE OF ENVIRONMENTAL DATA AND INFORMATION

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Presentation Outline

- About the project
- Main problems to be solved
- Best practices
- Solutions
«Information is knowledge, information is power, information is security»

Christiane Amanpour, CNN
Nowadays in use of the term “information”, very often we mean “spatial” or “geographic information” due to recent global “revolution” in consumer’s habits and manner of information consumption – to use images as the most visible evidence instead of (or in combination with) descriptive data.
SmartOpenData

SmartOpenData = The project «Open Linked Data for environment protection in Smart Regions»

Funded by European Commission (7FP, ENV.2013.6.5-3)

Duration: 24 months (2013-2015)

16 European organizations from Spain, Ireland, Italy, Czech Republic, Slovakia, Norway, Latvia, Portugal and France
The main objective

«To develop real (sustainable) proposals for building a Smart Open Data infrastructure for biodiversity and environment protection in European protected areas that satisfy the requirements of four kinds of stakeholders (target users):

- public bodies
- researchers
- companies (also SMEs)
- citizens»
The core objectives

- Heterogeneous environmental data, including research data
- Environmental data initiatives & projects (INSPIRE, GEOSS, GMES, Habitats...)
- OPEN LINKED DATA

INTEGRATION
Integration

- Environmental data and related metadata fusion (exploitation, harmonization & integration)
- Application of Linked Open Data (LOD) principles (data models and structures, shared vocabularies /NeoGeo, GEMET.../, unique links, RDF structures...)
- Visualization and publication methods of environmental data based on LOD
can SmartOpenData be applied generally to spatial data resource to public open data portals, GEOSS Data-CORE, GMES, INSPIRE and voluntary data (OpenStreetMap, GEP-WIKI, etc.)?

will it impact economic and sustainability progress in European environment research and biodiversity protection (understanding how to improve)?

can we make European Spatial Data also easily re-usable also for non-professionals (various organizations and individuals)?
On a technical level, the Smart OpenData will

- Harmonize geospatial metadata (ISO19115/19119 based) with principles of Semantic Web
- Provide spatial data fusion introducing principles of LOD
- Improve spatial data visualization of Geospatial LOD
- Publish the resulting information according to user requirements and LOD principles
Most important problems to be solved

- Focus on metadata
- Multilingualism
Harmonization of metadata

- Qualitative and “low cost” metadata plays the crucial role as an interface to the spatial content it describes.
- In the context of SmartOpenData, metadata serves as the exchange component allowing the bridging of INSPIRE requirements with other spatial worlds.
- Metadata will act as the entry point (interface) providing essential information for transformation of spatial data to Resource Description Framework (RDF) structures.
Multilingualism

- Is among most important problems to be addressed in the context of SmartOpenData
- Global problem – translation of geographical data and metadata (not yet been solved inside INSPIRE or GEOSS)
- There are two principal approaches to machine translation: rule-based and statistical
- Combined methods are also being investigated currently
- Concerning environmental and geographical data, there will be explore resource-limited adaptation to those domains in the context of SmartOpenData
The challenges

- **Discoverability** - to build strong catalogues of metadata from numerous sources is one of the best ways this can be achieved.

- **Federation** – to provide that publishing, and maintaining datasets and data catalogues will become more decentralized and essential for users.

- **Interoperability** - catalogues from multiple sources are composed by federation, it becomes more and more important for the platforms that these data catalogues on which they are built be compatible, even if they are built by different providers.
The pilots

- Agroforestry management pilot (Tragsa, Spain)
- Environmental research, Biodiversity pilot (MAC, Ireland)
- Water monitoring pilot (ARPA, Italy)
- Forest sustainability pilot (FMI, Czech Republic)
- Environmental data reuse pilot (SAZP, Slovakia)
Experiences

- Habitats - Habitats (Social Validation of INSPIRE Annex III Data Structures in EU Habitats) related spatial data is critical in the management of Europe’s bio-diversity. INSPIRE needs work here (Annex III data themes: Sea regions, Bio-geographical regions, Habitats & biotopes, Species distribution)

- Plan4business - plan4business develops a platform serving multiple providers and thus offering users a full catalogue of planning data such as transport infrastructure, regional plans, urban plans and zoning plans (see http://www.whatstheplan.eu/)
Habitats Changing Architecture Paradigm
Habitats Reference Laboratory
Habitats Linked Open Data
Plan4business approach
Location evaluator
SmartOpenData Architecture

Scenario for researchers

SmartOpenData System

Scenario for companies

Distributed Semantic Indexing

Scenario for end-users

Administration and Notification

Open Data Source Layer

Harmonisation of data Sources

Open Standards
KML; WMS; WMTS;
WFS; WKT; Others

External data Sources

Non Standards
Postgis; PostgreSQL; ESRI Shapefiles;
Documental Databases; Others.
SmartOpenData = combination of view on environmental data
Key innovations

- Distributed semantic indexing providing a service for searching and locating data based on semantic information
- Distributed data access
- Administration and notification, which provides administration facilities for managing users, workflows and data to data providers
Expected results

- Sustainable LOD infrastructure to promote environmental protection data sharing among public bodies in the EU
- Integration of semantic technologies and approaches
- Definition of business models focused on SMEs and based on innovative services
- Demonstration of the impact of the sharing and exploiting data and information from many varied resources – pilot applications
Thank you for attention!

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