

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

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**REAL CORP 2014**

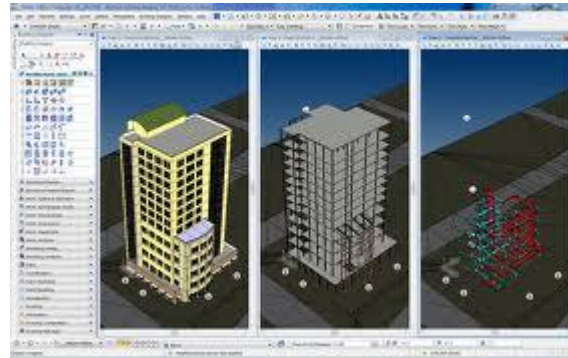
# Presentation Outline

- ❖ About the project
- ❖ Main problems to be solved
- ❖ Best practices
- ❖ Solutions

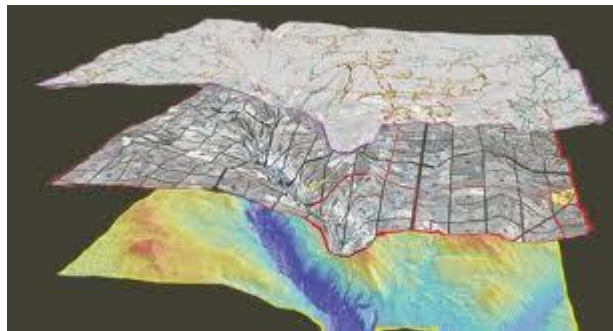


«Information is knowledge,  
information is power, information  
is security»

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



SmartOpenData

## Partners



# 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

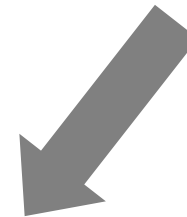
Heterogeneous  
environmental data,  
including  
research  
data



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 built 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

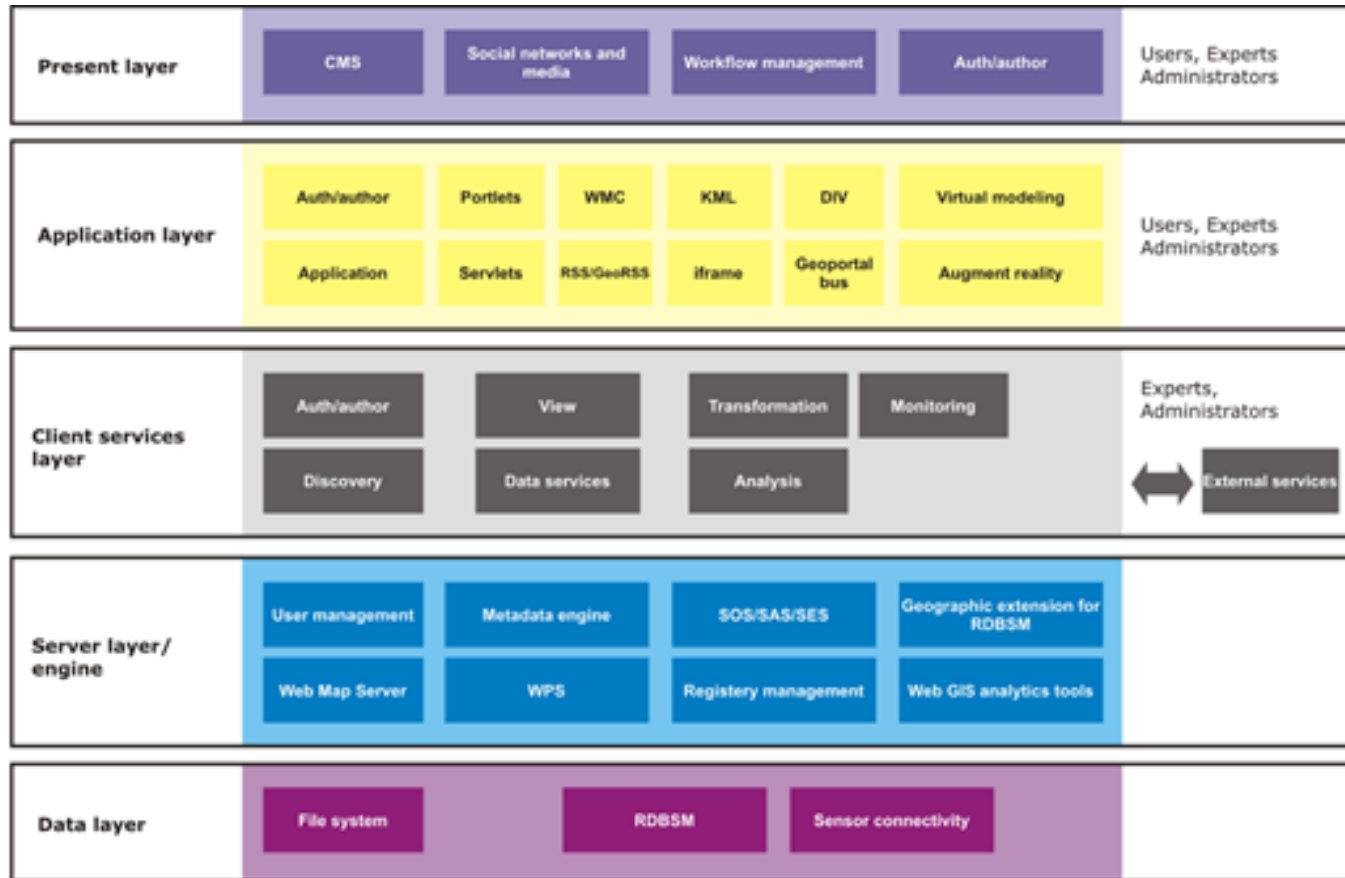
- ❖ Agroforestry management pilot (Tragsa, Spain)
- ❖ Environmental research, Biodiversity pilot (MAC, Ireland)
- ❖ Water monitoring pilot (ARPA, Italy)
- ❖ Forest sustainability pilot (FMI, Czech Republic)
- ❖ Environmental data reuse pilot (SAZP, Slovakia)

# Experiences

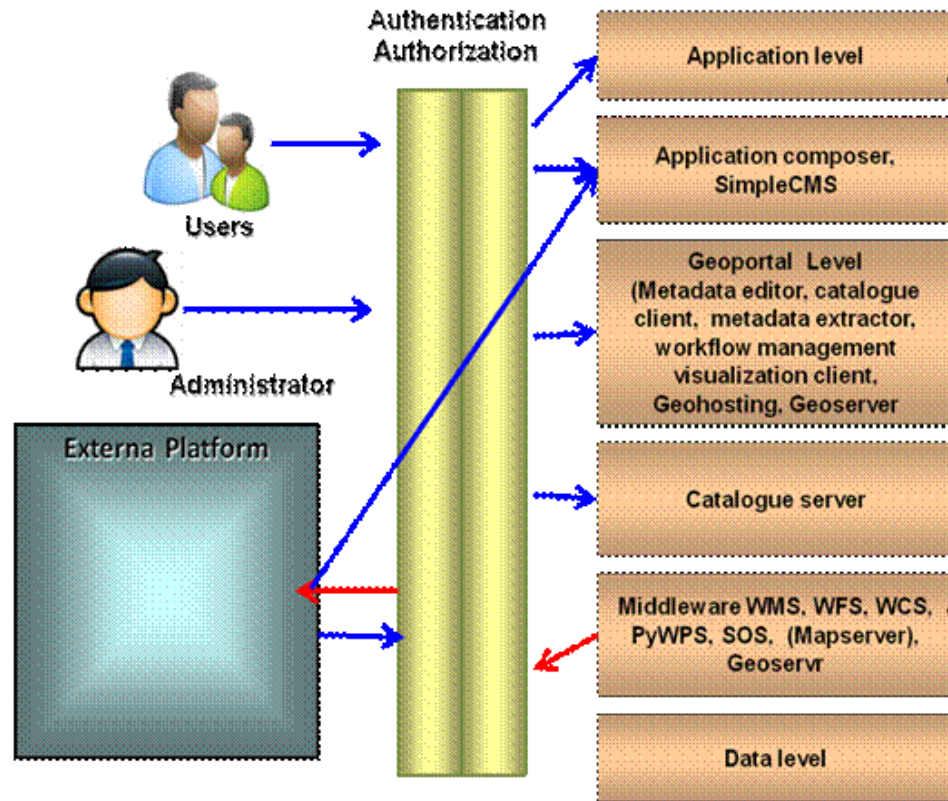
- ❖ Habitats - Habitats (**Social Validation of INSPIRE Annex III Data Structures in EU Habitats**) related spatial data is critical in the management of Europe's bio-diversity. INSPIRE needs work here ( Annex III data themes: Sea regions, Bio-geographical regions, Habitats & biotopes, Species distribution)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

Map - habitats - Windows Internet Explorer

http://www.habitats.cz/view

Soubor Úpravy Zobrazit Oblíbené položky Nástroje Nápověda

★ Oblíbené položky ★ GEOSS-ECP - Breaking N... Windows Německo

Map - habitats

Email: Password: Login Sign up Lost password more ...

Share: f in t

habitats

Addresses Metadata

Specify an address or locality Search

Home Metadata Map SuperCAT HS-CAT Map Projects Library Blog Follow us HELP

SOS Map

1: 86668

Eben

Ski resort **Eben** is placed in Salzburgin Austria. It is a part of large ski region **Ski amadé**. More information about Eben: [Wikipedia page](#).

20 km © Copyright 1490969.8, 6010742.0

Layers

Info

Maps

Public

These maps were created by the geoportal administrator from the provider's data that has been verified.

Basic INSPIRE

Environment

Water

Nature

Socioeconomic factor

Black Sea Land use

Climate temperatures

Demography

Ecoregions for rivers and lakes

Five meter elevation contour line

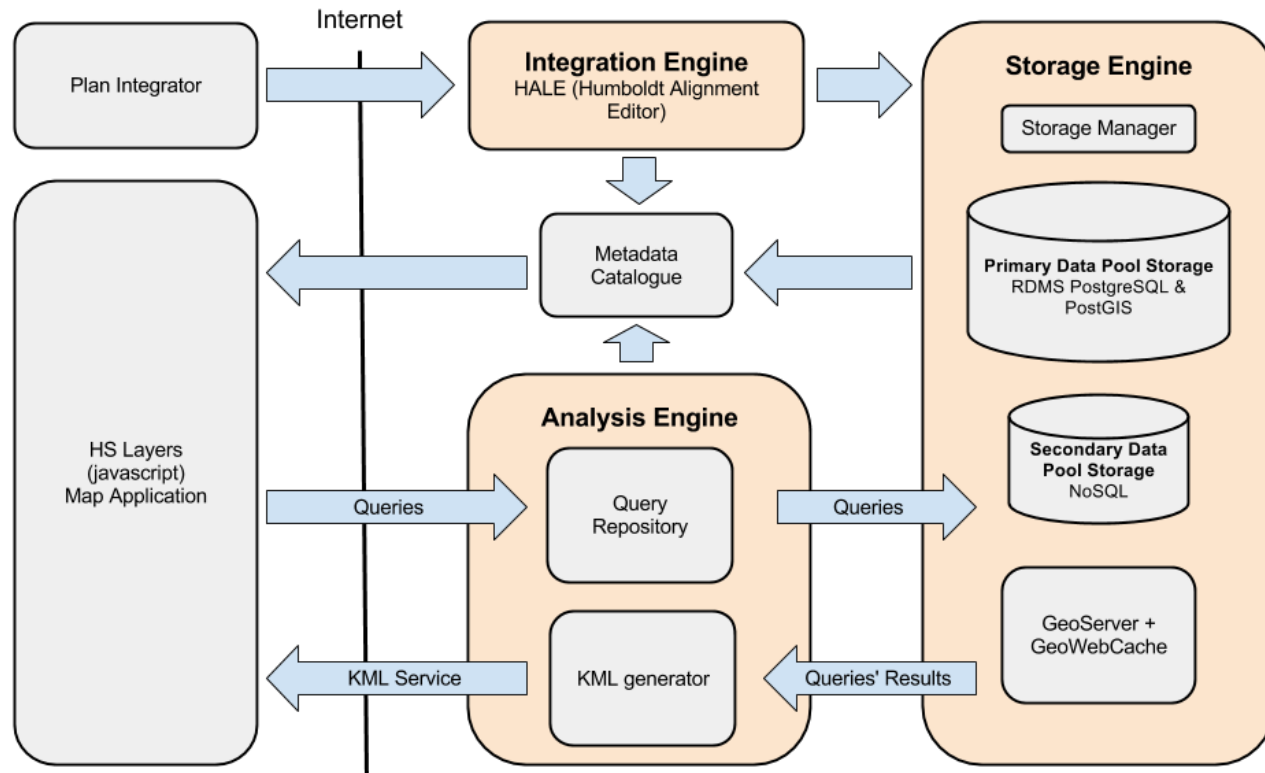
OWS

Hotovo Internet 100%

Start

3 P... Think... 3 Fi... 10 M... 7 M... S Skyp... 4 A... 2 I... 5 M... 100% 10:20

# Plan4business approach



# Location evaluator



<http://whatstheplan.eu/>

Select a region, a municipality or a point of interest in Czech Republic to generate a

Region Municipality Buildings

Search...

Google

Data map © 2013 Google, Imagery © 2013 DigitalGlobe, GEODIS Bmo, GeoBasis-DE/BKG, GeoContent - Podmínky použití

### REGION REPORT Plzeňský kraj (CZ032)

**Basic data**

- Total area: 7530 km<sup>2</sup>
- Population: 571256
- Population density: 75.86 inh. per km<sup>2</sup>
- GDP: 7226.0 mio. EUR

**Demography**

- Total population: 571256
- Population aged 0-14: 81010
- Population aged 15-64: 398420
- Population older than 65: 91826

**Economical factors**

- GDP per inhabitant: 12600.0 EUR
- Unemployment: 3.6 %

**Location**

**Demography (Detailed)**

- Total males pop.: 282660
- Total females pop.: 288596
- Males pop. 0-14: 41479
- Females pop. 0-14: 39531
- Males pop. 15-64: 202904
- Females pop. 15-64: 195516
- Males pop. 65+: 38277
- Females pop. 65+: 53549

**Population Trends**

- Increase in population: 453
- Crude increase rate: 0.8 %
- Natural increase in population: -322
- Crude natural increase rate: -0.6 %
- Crude birth rate: 10.0 %
- Crude death rate: 10.0 %
- Live births: 5566.0

■ The report contains the newest information published by Eurostat. Date of creation: 06/11/2013 12:35:3

Plzeň - sever  
Plzeň - jih

Okresní soud Plzeň - jih

518,647 45,26684

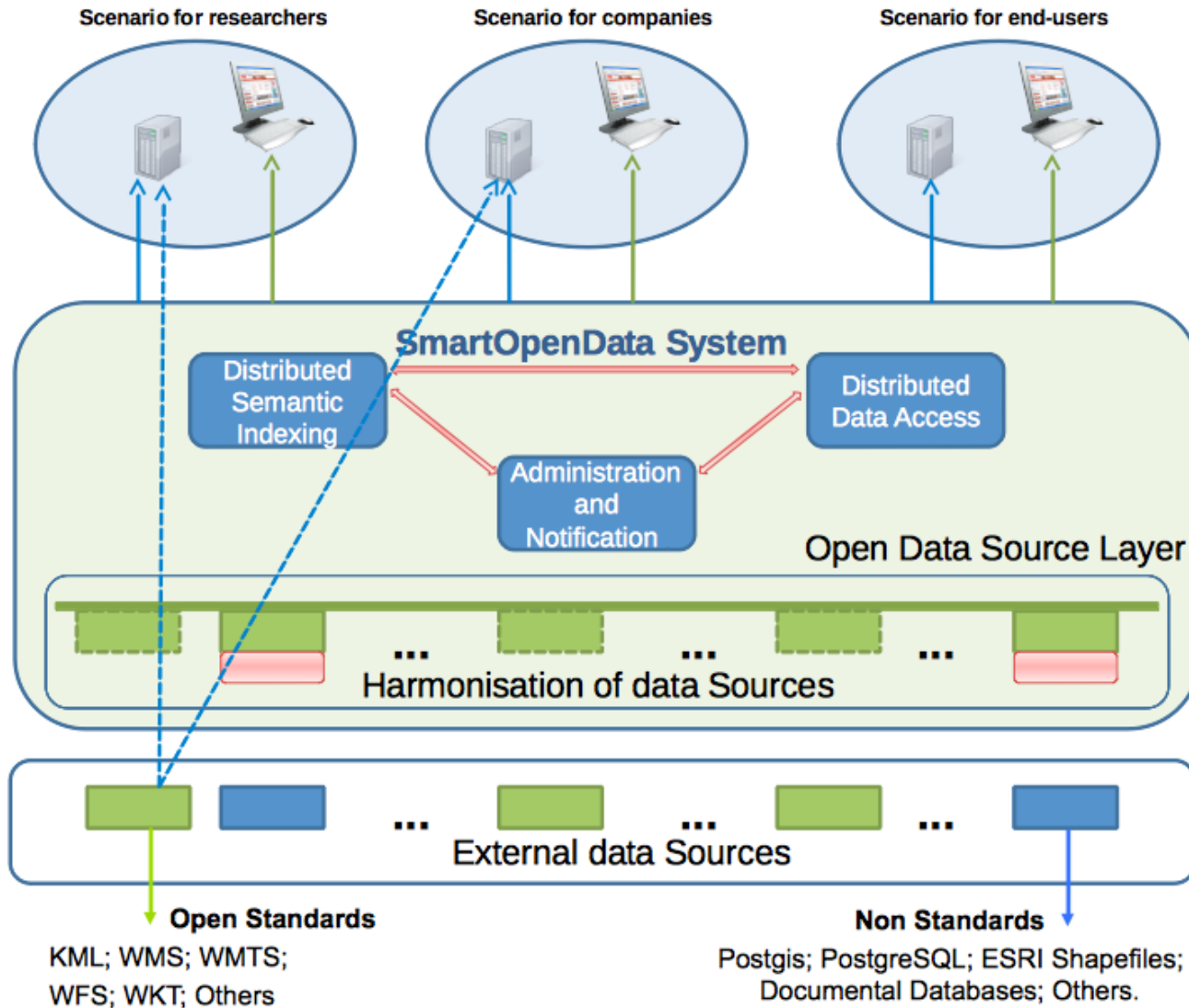
# Thematic Map Atlas

The screenshot displays the 'What's The Plan?' web application in a Mozilla Firefox browser. The browser's address bar shows the URL: [www.whatstheplan.eu/viewer?sessionId=BDc47Dc19ED05E074FDD7166518F6258#\\_48\\_INSTANCE\\_jr0b6uqTvTt\\_=http%3A%2F%2Fwww.whatstheplan.eu%2Ffp4b-dev%2Fcat%2F%3F](http://www.whatstheplan.eu/viewer?sessionId=BDc47Dc19ED05E074FDD7166518F6258#_48_INSTANCE_jr0b6uqTvTt_=http%3A%2F%2Fwww.whatstheplan.eu%2Ffp4b-dev%2Fcat%2F%3F). The application header features the title 'WHAT'S THE PLAN?' and navigation links: WELCOME, THEMATIC MAP VIEWER, LOCATION EVALUATOR, LAYER MANAGER, MAP CREATOR, and INTEGRATION ENGINE. The main content area shows a map of the Czech Republic with various protected areas overlaid in green. A 'Layers' panel on the right side of the map lists the following layers:

- Ochráněná toliškovská území
- Ochráněná sídelní území
- Ochráněné oblasti přírodních akumulací vod
- Ochráněné oblasti přírodních akumulací vod
- Přírodní parky
- Přírodní parky
- ÚSES - směry propojení regionálních biokoridorů
- ÚSES - směry propojení regionálních biokoridorů
- ÚSES - smy nadregionálních biokoridorů
- ÚSES - smy nadregionálních biokoridorů
- ÚSES - regionální biokoridory stávající
- ÚSES - regionální biokoridory stávající
- ÚSES - regionální biocentra
- ÚSES - regionální biocentra
- ÚSES - nadregionální biokoridory
- ÚSES - nadregionální biokoridory
- ÚSES - nadregionální biocentra
- ÚSES - nadregionální biocentra

The bottom of the screenshot shows the Windows taskbar with various application icons and the system tray displaying the time as 13:00 and the date as 4.2.2014.

# SmartOpenData Architecture



# 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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