Title:

A9.3-D6: HS Urban Atlas - Demonstrator final release

Author(s)/Organisation(s):

Otakar Cerba (HSRS)
Karel Charvat (HSRS)

Working Group:

References:

Quality Assurance:

[ ] Review WP Leader	(WP Leader:)
[ ] Review dependend WP Leaders	(Depended WP Leaders:)
[ ] Review Executive Board	(Executive Board Members:)
[X] Review others	(Other Reviewers: Gabriela Galikova)

Delivery Date:

2010-12-06

Short Description:

This deliverable consists of the implementation of the scenario demonstrator. In order to facilitate Humboldt user community, the Humboldt framework experience during the scenario development and implementation is produced in the form of a step-by-step guidance and uploaded on the Humboldt training platform.

Keywords:

Demonstrator, Humboldt, Urban planning

History:

Version	*Author(s)*	*Status*	*Comment*
001	Otakar Cerba	RFC	
002	Otakar Cerba	Final	Review and Integrated all information into final deliverable

Table of contents

Introduction

This deliverable consists of the implementation of the scenario demonstrator. In order to facilitate Humboldt user community, the Humboldt framework experience during the scenario development and implementation is produced in the form of a step-by-step guidance and uploaded on the Humboldt training platform. It is accessible from the URL: http://www.inspire-x.eu/humboldt/ (user registration and authentication required).

Scenario Demonstrator: Component 1

Scenario general overview

The Urban Planning Scenario is focused on the harmonization of spatial data used in urban and spatial planning. The urban planning and spatial planning represents the ideal example of need of spatial data harmonization at international level. Because of high-quality spatial and urban planning needs the high-quality spatial data sets enable qualified administrative and legislative decisions. The publication of spatial planning activities makes possible integration, cooperation and control for public too. Spatial and urban planning data sharing is also very important for data providers, municipalities or planners. It is necessary to realize that only harmonized data could be shared, combined and processed by automatic tools (e.g. OGC web services).

The Urban Planning scenario context

Use-case of the Urban Planning Scenario is focused on harmonization of Spatial Analytic Backgrounds (SAB) and Corine Land Cover (CLC) data set. The SAB represent the Czech standard of background data used in spatial and urban planning.

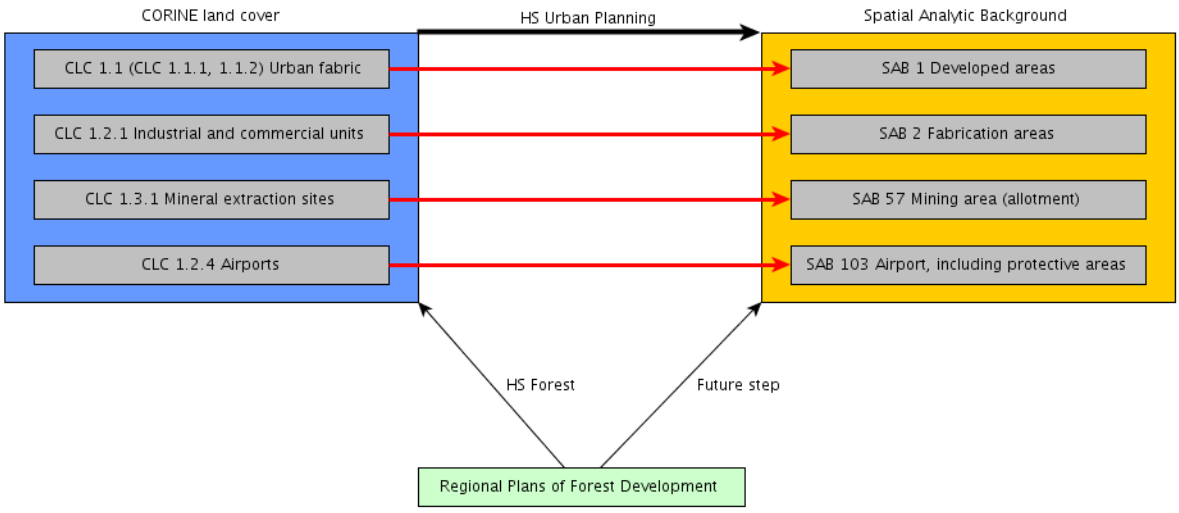
The SAB are collected for design of urban or spatial plans (there is not any standardized data model). The different data set (from different providers) can be very heterogeneous, because there is not any standard defined by legislative (just a list of data themes). They can be based on CAD model, GIS model, raster map etc. Some layers of SAB contain land cover or land use information. Therefore an interconnection of SAB and international data set CLC enables the more efficient, faster and cheaper collecting, updating and checking of spatial data. The method based on mapping of data models could be used in other data sets used in urban and spatial planning (e.g. hydrology data, environmental data etc.).

General harmonisation of spatial planning data could have following benefits: any duplicities in data, clear origin and assurance of quality of the data, data structure standardisation, data purity, security and structure uniformity, reciprocal data accessing per WMS (Web Map Service), WCS (Web Coverage Service) and WFS (Web Feature Service), fall of cost for data updating and maintenance, better software development, better source exploitation, improvement of chances in communication with authorities or increasing educational activities.

The Scenario Urban Planning concentrates on conversion between some items of CORINE land cover model to specific items of Urban planning model (CLC → SAB):

- CLC 1.1 Urban fabric (1.1.1, 1.1.2) → SAB 1 Developed areas
- CLC 1.2.1 Industrial or commercial units → SAB 2 Fabrication areas
- CLC 1.3.1 Mineral extraction sites → SAB 57 Mining area (allotment)

- CLC 1.2.4 Airports → SAB 103 Airport, including protective zones



Goal of HS Urban Planning:

- support data source harmonization in the field of spatial planning
- support decision making of municipalities, regional and local authorities
- enhance future direction and development of GMES
- integration of spatial planning data and land cover data

INSPIRE and the Urban Planning scenario

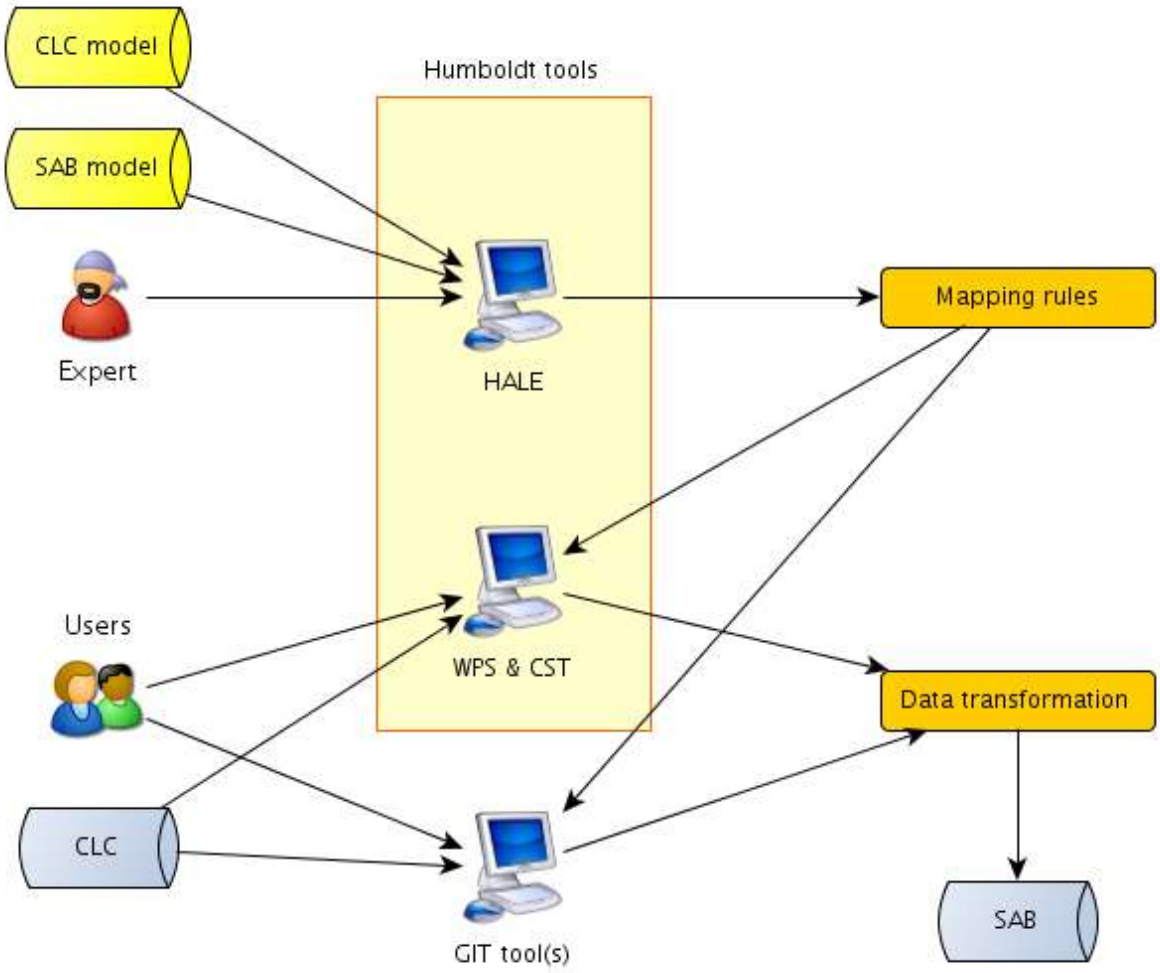
The Urban Planning Scenario cooperates also with other similarly oriented European project like Plan4all (www.plan4all.eu) or SDI-EDU (www.sdi-edu.zcu.cz). The results of the Urban Planning Scenario (data models, metadata profile) is INSPIRE compliant.

The results of the Urban Planning scenario, including demonstrator are and will be applied in many European projects connected with INSPIRE directive (Plan4all, SDI-EDU, BRISEIDE etc.).

The involved actors

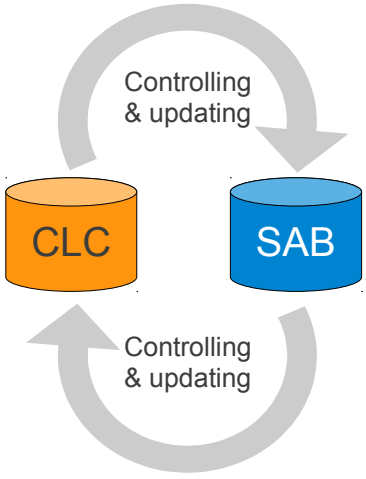
Main users of HS Urban Planning – profiting from the application:

- Public
- Municipalities, spatial planners, spatial data providers
- Research institutions



Use cases and user stories created

The use case of Humboldt Scenario Urban Planning is possibility of controlling and updating of both data sets (selected classes) on the area of the Czech republic.



Analysis of required data and definition of the Scenario data model

Spatial (Territorially) Analytic Backgrounds (SAB)

Description:

The SAB are collected for design of urban or spatial plans (there is not any standardized data model). The different data set (from different providers) can be very heterogeneous, because there is not any standard defined by legislative (just a list of data themes). They can be based on CAD model, GIS model, raster map etc. The SAB data are composed of 156 thematic data layers defined by ordinance 500/2006 (e.g. cultural monuments, natural ecosystems, hydro engineering structures, piping systems, traffic infrastructure etc.). SAB data are the secondary data in many cases. They are selected from many different sources and providers. These sources are not defined but recommended. The SAB data are without any detailed description (any data models, mandatory attributes, data types, restriction of values, scale etc.). Therefore there is just a simple example described just geometry and code of SAB (code A1-A119 for items collected by municipalities; code B1-B37 for regions). The real can contain some other attributes, but they are not important in our case.

Standards:

Any common standard – or more precisely there are about five major data model supported by software producers.

Geometry types:

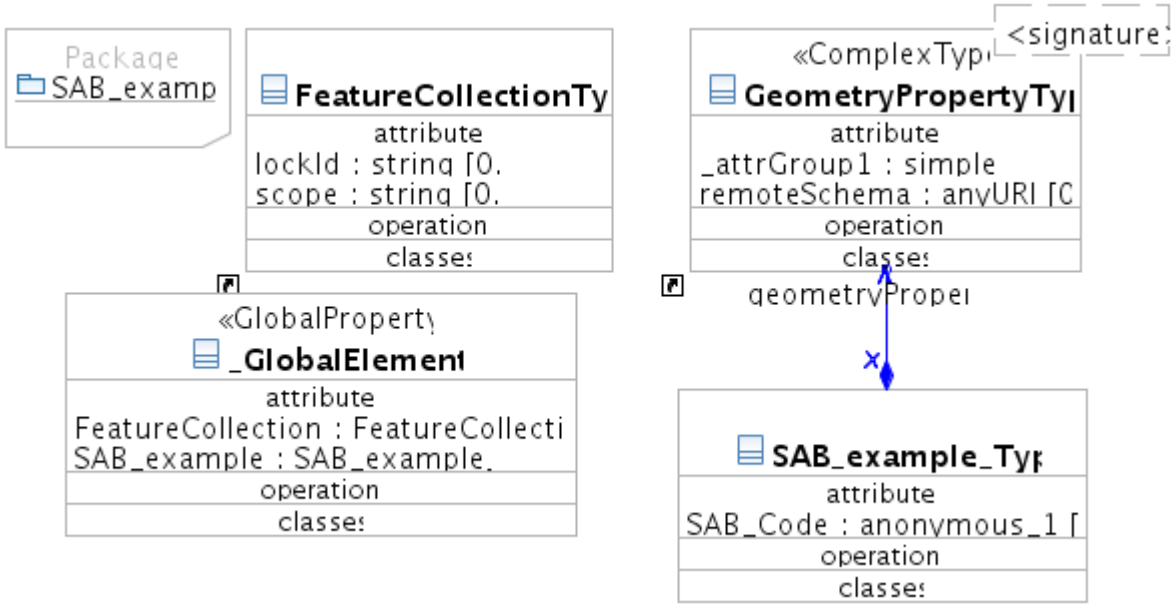
Data can contain one type of geometry primitives (point, line, polygon), more types of geometry elements and some texts, too.

Storage format(s):

Storage formats are (can be) also very heterogeneous – GIS formats (e.g. SHP, SDF), CAD formats (e.g. DXF, DGN), XML formats (e.g. GML, LandXML), raster images (e.g. TIFF, PNG), paper maps etc.

Conceptual model (UML Class diagram):

With respect to heterogeneity of data models there is not any common conceptual data model. There are two important and mandatory parameters – geometry and the code of relevant layer of SAB.



- GEOMETRY: Geometry
- CODE_SAB:Integer (1-119; 1-39)
- PARAMETERS: String...

Physical model:

XSD schema of one example of SAB (simple sample – after acquisition of real data there will be design the similar model with same mandatory parameters).

Coordinate reference system:

S-JTSK (Czech national system)

Scale / resolution: (only recommendation):

In the abstract from 1:1 000 to 1:200 000; in practice to 1:20 000.

Language:

Czech

Metadata:

The current data are described by paper forms called passports. Our purpose is to combine the passport standard, ISO metadata standards and requirements of INSPIRE directive and to define Urban Planning Metadata Profile.

Visualisation:

Vector or raster maps (the data are mostly visualised and stored in the same formats).

Title:

Corine Land Cover (CLC)

Description:

Land cover data set CORINE Land Cover (CLC) covers many European states. There are some other benefits of using the CLC data set: standardisation, high number of users, support of legislation. The higher level of detail of CLC was emphasised in many studies and projects. Above all densely populated and dynamically changing areas needs the updated and detailed land cover information for their further development.

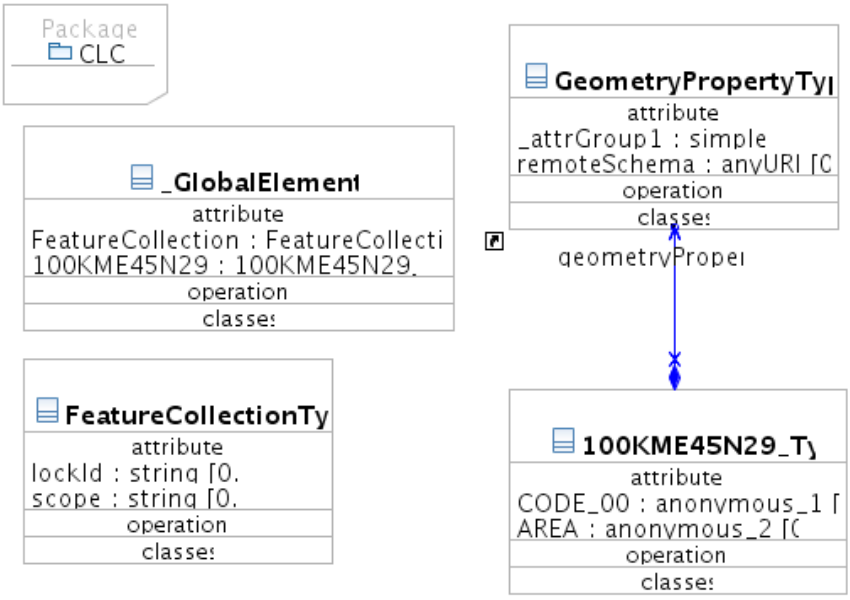
Geometry types:

Data contain polygons.

Storage format(s):

Shapefile

Conceptual model (UML Class diagram):



The CLC data are composed of features with three parameters:

GEOMETRY: Geometry

CODE_00: String (enumeration of values in Appendix 1)

AREA: Double

Physical model:

XSD schema based on example of CLC data.

Coordinate reference system:

ETRS 1989

Title:

Scale / resolution:

1:100 000 or 1:250 000

Language:

English (translated to other languages)

Visualisation:

Raster maps

Harmonisation issues

The following list contain an ideal, maximal version of harmonization processes:

1. Transformation of source data to GML format and XSD scheme
2. Conversion to CLC
    - Harmonisation of classifications schemes and systems, codelists, terminology and vocabulary (selection of corresponding items) must be created before building harmonisation tools, because there is necessary to define the rules for mapping language.
    - Type of geometric primitives (all types to polygons – this harmonisation step is necessary, but the majority of the selected source data /maybe all data/ are in the form of polygons).
    - Data must be converted from Czech national system S-JTSK (SAB) to system ETRS 1989 (CLC).
    - Due to the difference of the source and target datas' geometry, the transformation and/or improvement of geometry (e.g. elimination of differences between data providers and adaptation to reference data, edge-matching) are necessary. It relates with next item – generalisation.
    - Because the harmonised data layers are in different level of detail and target data sets have mostly the smaller scale than source data, the generalisation methods could be used.
    - Source and target data are coded in the same language, but due to the CLC data do not contain any description except codes and these codes are translated into many languages including Czech, the multi-linguality is supported.
3. Transformation of source GML data to required format(s) – SHP, raster, web service etc.