1 Publishable Summary

plan4business

A service platform for aggregation, processing and analysis of urban and regional planning data

Project Idea and Perspectives

Urban and regional planning data sets are not aggregated so far. Thus, it is very difficult to use them for any other purpose than for printing or simple publishing by the authorities that created them. It is not possible to create time series or comparative analyses on these data sets in cross-regional context. Researchers, spatial planners and professionals from disciplines such as insurance industry, investors, real estate, or market-relevant activities related to urban development have a growing stake in such capabilities.

Plan4business aimed to create a service platform for integration, storing and analysing of spatial planning data. The platform serves as catalogue of planning data such as transport infrastructure, regional plans, urban plans and zoning plans. The aggregation platform offers clients data in an integrated, harmonised and thus ready-to-use form. It also provides rich analyses and visualisation services. Such services are offered via several interfaces, such as an API (Application Programming Interface) and interactive web frontends (http://www.whatstheplan.eu/ and http://askwhere.eu).

The two main challenges that have so far hindered (re)use of planning data in such a manner are highly automated data integration and an ICT system for complex queries over the diverse planning data sets.

The plan4business Objectives and Approach

The main research and development challenge that this project tackled was the development of an approach that turns large-scale data integration from a liability into an opportunity. For this purpose plan4business designed, evaluated and implemented a framework that is:

- Specific: The developed tools and executable analyses are specific to planning data. This means they are not applicable to generic data integration problems, but provide a high effectiveness for specific issues;
- Process-Oriented: The integration and harmonisation process is divided into clear steps, each can be conducted individually. In this way, different curators can specialise on distinct steps in the process;
- Declarative: Any schema mapping (logical or conceptual) is performed in an atomic, declarative way. Thus, schema mapping parts can be re-used, e.g. for automatic determination of required additional mappings when several variants of a schema are mapped;

- Collaborative: On the basis of the right incentives as well as the process-oriented and declarative/atomic integration approach, the principles of collaborative mapping can be used on the planning data integration issue;

Another major objective of the project was to overcome the user issues with data integration and harmonisation. Geodata users had to fend themselves with the complex issues appearing in this process, using complex tools that cover merely individual aspects, such as geometric rectification. This makes data integration and harmonization steps an expensive task. We argue that many of the core problems that are encountered by geodata users are mutual and can be solved in a collaborative approach. What was missing so far is a proper organisational and technical platform for this.

Concept

The overall concept of the plan4business project comprises three main aspects, namely the plan4business platform (1), spatial planning data (2), and a solid business model (3).

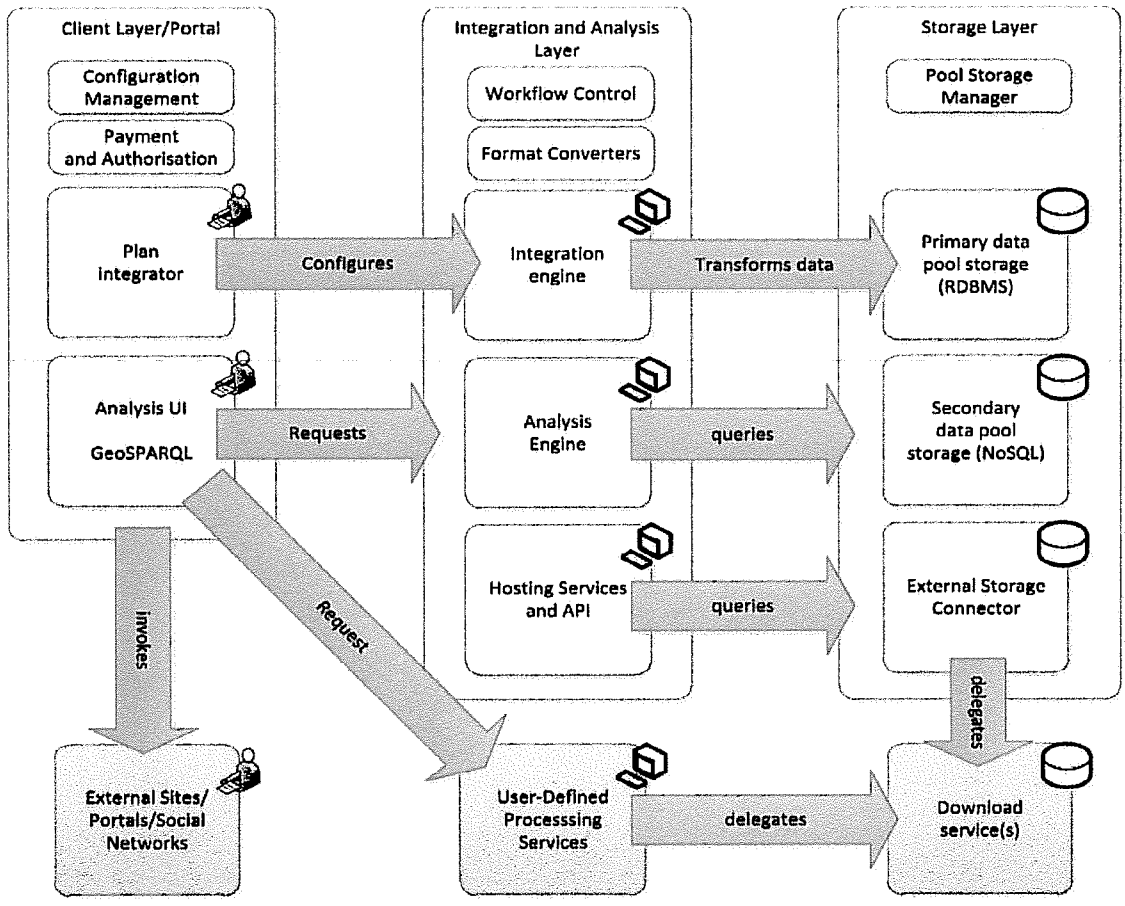

Figure 1: Architecture of the plan4business platform. The platform is comprised of the three layers client layer, integration and analysis layer, and storage layer.

The **plan4business platform** (1) consists of several technical components, grouped into three layers (Figure 1). The first layer contains human-machine interfaces, specifically for planning data management, integration and conversion as well as for accessing the analytical functions of the platform. The second layer provides two groups of processing engines, again for integration and harmonisation on the one hand and for analytical processing on the other hand. In addition, this layer provides the plan4business API, which is utilised by AVINET for their own portal solution, which enables their clients the access to pan-European data. The final layer is a storage layer, which contains a storage manager as well as two different data bases, each optimized for different goals.

Spatial planning data (2) aggregated by plan4business include

- Urban and regional planning data from several countries,
- Land use data including GMES Urban Atlas data,
- Land use data from Czech Cadastre,
- Land cover data,
- Derived Open Land Use maps,
- Open Street Map data as representative of road network and as a reference layer,
- Natura 2000 data as information about potential restriction coming from environment protection,
- Market information (number of properties, sale transactions, price levels),
- Social and economic data (CSP, Eurostat data),
- Individual property data (legal status, current use) and cadastral parcels,
- Statistical data from several countries.

The **business model** (3) of the plan4business project foresees several groups of active stakeholders (Figure 2). The plan4business platform is connecting data providers with market and society. It has the ability for generation of new commercial and non-commercial applications and services.

Results of the Project and Next Steps

During the first year of the project requirements were collected to identify the needs of professionals, who are active in the field of urban and spatial planning. From the requirements analysis the user stories and use cases were identified and further developed as a basis for the realisation of the plan4business platform. Following those steps the development infrastructure was elaborated and the system specifications defined. Following the specification the platform with its components and the related services was implemented during the second year.

In addition the business model was developed. Following the discussion and the experiences among the partners and with the active stakeholders we developed the final business model as presented in Figure 2. Two platforms are provided on one side the open data platform with open

services, which will be maintained and supported by the plan4all Association (in the course of formation under the leadership of UWB), on the other side a commercial platform offering restricted data and commercial services maintained and supported by the plan4business consortium partners under the leadership of HSRS. The platform is open for additional services provided by partners from the consortium, but also beyond, based on joint business agreements. To strengthen the approach the definition of the legal frames for data and services was prepared. Initial actions, such as the customer relationship management, data and service management, and customer cost/benefit analysis, were performed that followed the approach of the business model. Communication with future platform users and data providers was established.

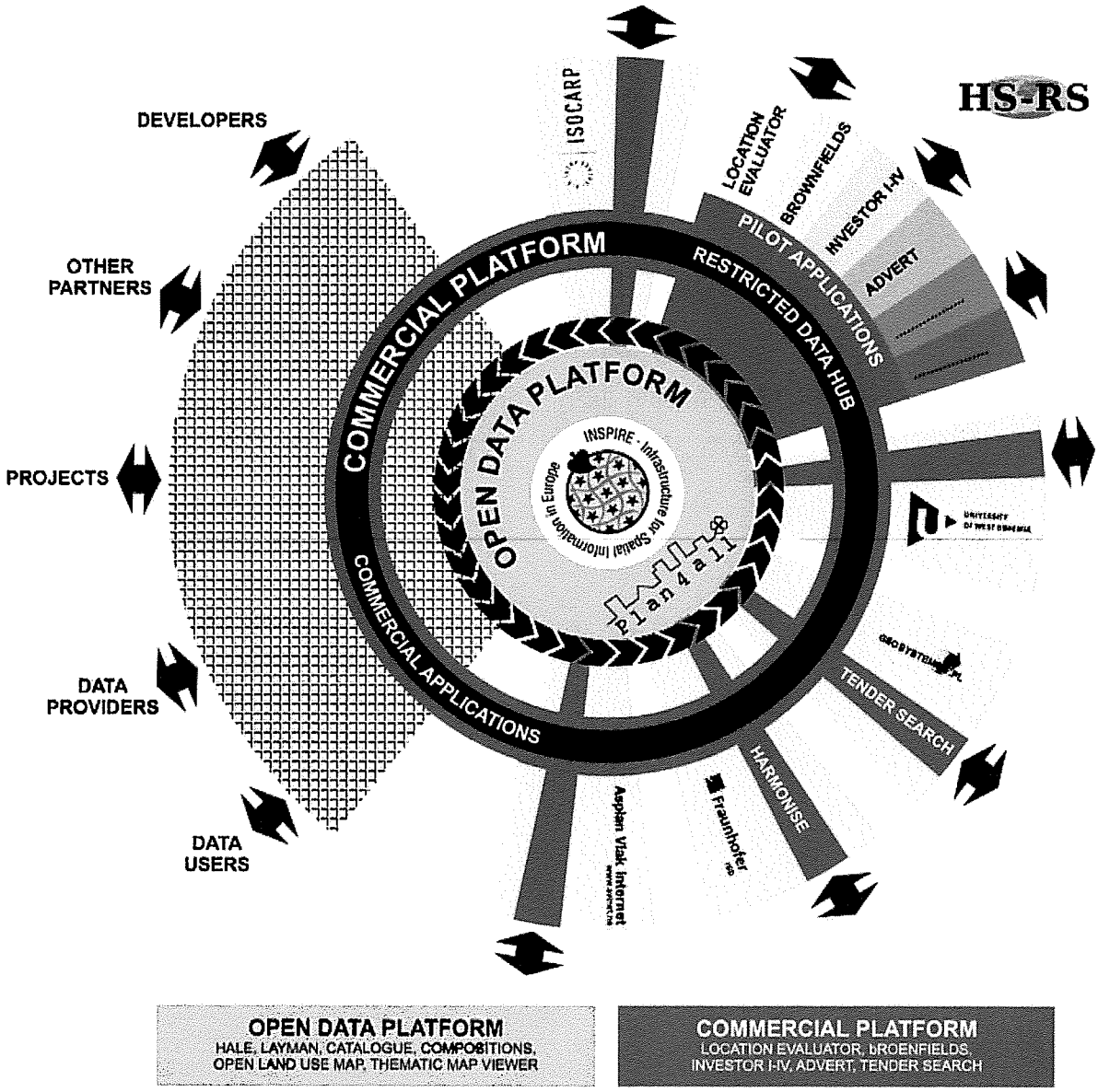

Figure 2: Plan4business business model

One focus of the platform development was on system planning and implementation of the client side of the plan4business portal. The important part was to define and design the overall structure of the portal *Whats`sThePlan* and AskWhere with the user interface as a web-based interface utilising components and services of the project (Figure 3).

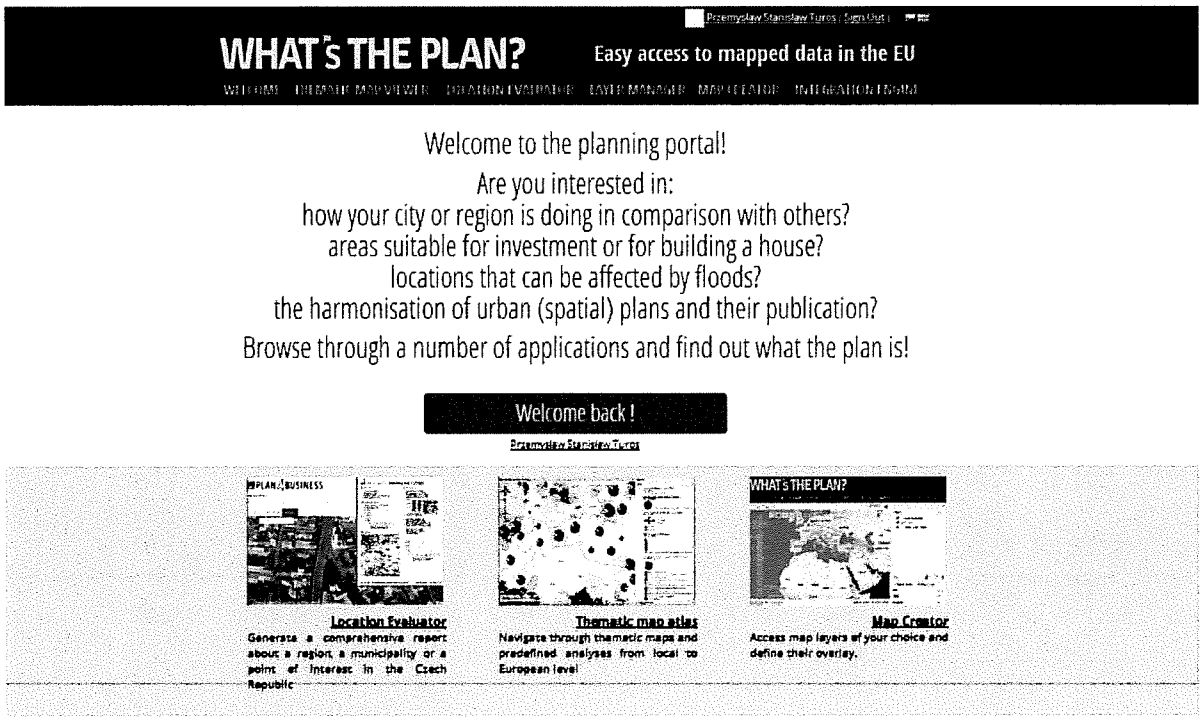

Figure 3: Welcome Portal of What`sThePlan (http://www.whatstheplan.eu)

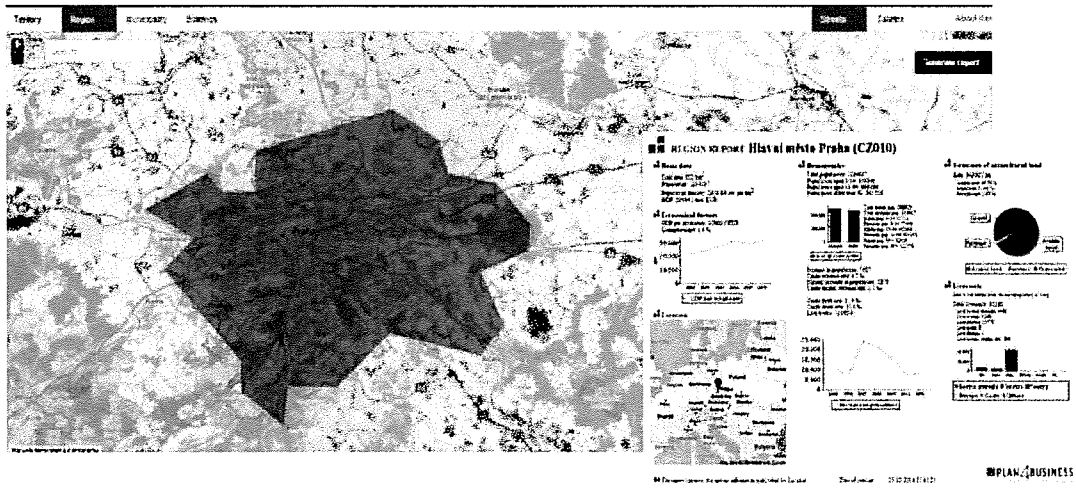

Figure 4: Location Evaluator (http://www.whatstheplan.eu/evaluator)

In a next step, the client side implementation for the collaborative integration of spatial and non-spatial data into the plan4business data pool was set up. The work encompasses the design and implementation of the web interface for the data upload and harmonisation workflow.

The second focus was the setup of the server part of the plan4business platform including the Integration, Storage, and Analysis Engines. This includes also the development of an API (Application Programming Interface) and access control system.

Based on the discussions on planning data and their integration, the integration workflow was created. Schema mapping and data transformation is based on the outcomes of the project Humboldt, especially the Humboldt Alignment Editor (HALE). . Mapping of heterogeneous data into common plan4business application schema was analysed. The strategy for possible solutions and further steps was outlined and implemented.

The Analysis Engine is the component ensuring management of spatial planning data stored in a relational database. It enables spatial planning data accessing and processing and spatial planning data retrieval for visualisation in the map client. The Analysis Engine provides access to all analytical functions of the spatial database. The focus was on analysis that can be performed using available data such as spatial plans, flood areas and other.

The large set of data was collected and is made available in the primary data storage as input for the analysis. Those data are for example pan-European data sets extended with more detailed regional or local data sets covering spatial planning related data, administrative, transport, environmental, statistical data and others.
Based on the platform a set of Applications and services was developed and are made available. Those are for example:

- Plan Integrator
- Layer Manager
- Map Creator
- Thematic Map Viewer

- Location Evaluator
- Tender Search

Based on those result the business model will be implemented to offer the open data platform as well as the commercial data platform. This will include continuous development of the platform and of new and advanced services utilising the platform for commercial and non-commercial users.

Further, the current data pool will be extended in two directions, first to reach a broader coverage of Europe and second to extend the data types made available. A focus in this context is also to reach an adequate quality of the data to make them comparable across Europe.

Impact of the plan4business Results

The results of the plan4business project with its ICT platform and data pool will have impact in urban and regional planning as follows:

- Overcome the heterogeneous situation of planning information across Europe through harmonisation of the data
- Contribute to better cooperation in cross border activities and transparency of spatial planning activities
- The interactive platform will provide solutions for identification of urban areas and more dynamic models of investment to support the criteria of the Europe 2020 Strategy.
- Impact on European economy and services by integrating current planning data sets from selected European countries building up an attractive source of information for a wide range of branches.
- Open new service opportunities for public and private sector related to business activities and land (re)development.
- Make the technology and data available for every professional or interested person.
- Support for European Open Data strategy and for Open Data Public Private Partnership

General Information

Plan4business was a small and medium scale focused research project (STREP) within the Framework Program 7 of the European Commission. The project was accepted to the ICT call FP7-ICT-2011-SME-DCL "SME initiative on Digital Content and Languages" was funded by the European Commission (Project number 296282).

The project was established with six partners from five countries to deliver the project goals and objectives. The partners include ISOCARP as representative from the user community, two research groups from University of West Bohemia (UWB) and Fraunhofer IGD, and three industrial partners with two SMEs: GEOSYSTEMS Polska Sp. z o.o., Help Service Remote Sensing (HSRS), and Asplan Viak Internet as. (AVINET). The project was coordinated by Fraunhofer Institute for Computer Graphics Research IGD, Darmstadt, Germany. The project commenced on April 1, 2012 and finished in March 2014.

Plan4business has established a Stakeholder Board to obtain further inputs from the community, secure evaluation and feedback on project developments and to support the dissemination of the results via the user communities.

General information concerning the project as well as a list of the publicly available results and deliverables can be obtained at the plan4business website **http://www.plan4business.eu**. For further information, please, contact the plan4business Project Office or the Coordinator.

plan4business Project Office:
Fraunhoferstr. 5
64283 Darmstadt
Germany
po@plan4business.eu

plan4business Coordinator:
Dr. Joachim Rix
coordinator@plan4business.eu