NSDI IN THE CONTEXT OF INSPIRE – SLOVENIA'S STATE OF THE ART AND PRIVATE SECTOR CHALLENGES

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ABSTRACT

In Slovenia, just recently, Act on Spatial Data Infrastructure was adopted. It defines general rules for establishing infrastructure for spatial information in the Republic of Slovenia, according to the Directive of the European Parliament and the Council, INSPIRE.

Infrastructure for spatial information consist of metadata, spatial data sets and spatial data services, network services and technologies, agreements on sharing access and use, and coordination and monitoring mechanisms, processes and procedures, established, operated or made available for the purpose of the law eg. Directive.

The Surveying and Mapping Authority of the Republic of Slovenia was nominated as a national contact point for INSPIRE. The Government will nominate an inter-sectoral commission for infrastructure for spatial information that will coordinate all work in the respective field. The formal process has started. In practice, many data users and data providers operate in line with the main INSPIRE principles. But, it is always a question of coordination, management, data quality, data actuality, responsibilities, financial issues and a general aim to move the issues forward. Member States reports that will be prepared for the Commission by 15 May 2010 will show state of the art of activities in the implementation of the directive.

In the framework of the NSDI and INSPIRE directive the role of the private sector is not explicitly defined. It is the fact that private sector companies are data providers on one side and data users on the other side. As such, companies are aware of data value and are an indispensable partner in the establishment, maintenance, development and innovation of spatial data infrastructure. It is their challenge and an external, society expectation. The private sector needs to enter into public-private partnership arrangements and to explore the models of partnership cooperation.

There need to be more interactions between EuroGeographics, national mapping and cadastral authorities, private sector and NGO's and other relevant associations, not only in the South East Europe, but at a larger, European scale. Best practices from different countries should be used for supporting better development of NSDIs.

Key word: INSPPIRE, NSDI, Public Private Partnership, Slovenia, spatial data infrastructure

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1. INTRODUCTION

Europe and its members are increasingly facing challenges which demand radical changes in the economic and environmental fields. A small contribution to harmonization of efforts in the environmental field is also the adoption of the INSPIRE Directive, one of the results of which should be the establishment of NSDIs in the Member States. Public administration, academia, NGOs and personal initiative are facing challenges to respond to the changing and challenging market needs. Private sector has potentials that have to be materialized. Public private partnerships (PPP) have to be strengthened and PPP arrangements need to go beyond traditional contracts. There needs to be some sharing of risks, benefits and rewards, designed to create a collaborate effort to drive forward real advances in public services. Directive-oriented implementation has not yet begun in Slovenia; however the development in this direction has been planned, developed and monitored for several years.

2. IMPLEMENTATION OF INSPIRE DIRECTIVE

INSPIRE directive provides general rules needed for the establishment of the infrastructure for spatial information in the European Community, for the purposes of Community environmental policies and policies or activities which may have an impact on environment (EUR-LEX,2010). In Slovenia the transposition phase is in process with adoption of a new law in February 2010, where The Surveying and Mapping Authority of the Republic of Slovenia (SMCA) have a leading role.

SMCA has been active during the time that INSPIRE directive has been developed, coordinated and finally adopted. Therefore SMCA already manages majority of data types listed in annexes to the Directive INSPIRE. Metadata services and data viewers are already available to users through web portal 'prostor'. For the users good access to data and services related to spatial data and their use are assured. Search services for most of the spatial data are available to users without unnecessary administrative obstacles (Petek, T., 2008).

Slovenia is now facing a responsibility for establishing Slovenian spatial data infrastructure (SDI) and mechanisms for coordination of all stakeholders. It is necessary to define legal and technical details of spatial data interoperability, review data access rules for spatial data, which are managed by public authorities in Slovenia and harmonize pricing policy rules.

2.1. LEGAL ASPECTS

Act on Spatial Data Infrastructure was adopted in February 2010 (Zakon o infrastrukturi za prostorske informacije - Ur. L. RS 8/2010). It provides the legal framework for the establishment and operation of spatial data infrastructure in the Republic of Slovenia as part of the European infrastructure. Under that law, the Slovenian law transmit INSPIRE directive establishing an Infrastructure for Spatial Information in the European Union.

The new act includes all the measures needed to ensure consistent spatial data and the completeness of the database entries for interoperability of spatial data from different databases and connectivity infrastructure for search, access and use of spatial data. It defines all the involved parties, their tasks and obligations to establish the needed components of SDI that will be in line with INSPIRE directive and also with Slovenian needs and tradition.

Consistent with the INSPIRE directive new act defines a list of spatial data and classification of data, establishment and management of geo-portal, content of metadata, interoperability of spatial data and services associated with them, network services, limiting of public access (according with the law on public information - access to information on emissions into the environment is not restricted), charging for network services (free access - viewing of data, data transformation services can be charged by price published in the Catalogue of public information) and sharing data and services.

Act establishes a so-called national point of contact, which is responsible for contacts with the European Commission regarding the INSPIRE directive and for the effective implementation of an infrastructure for spatial information. This task is the responsibility of the SMCA as a body within the Ministry of Environment and Spatial Planning.

In the new act main tasks of national point of contact are defined. These tasks are the following:

- Keep and maintain a list of spatial data
- Keep detailed descriptions of the spatial data
- Manage the geo-portal for spatial information
- Keep and maintain an information system for the metadata
- Take care to ensure interoperability of spatial data and services in connection therewith
- Prepare proposals for the operational programs of the Government
- Ensure implementation of the implementing rules of the INSPIRE Directive in the Republic of Slovenia
- Developing and to complementing strategy for SDI
- Developing a program of actions and measures necessary to meet the requirements for establishing of SDI
- Preparing a report on the provision of infrastructure for spatial information for the European Commission

In addition to Act on Spatial Data Infrastructure many other regulations are governing the implementation of ISPIRE directive. Most important are the following:

- Access to public sector information Act (PSI directive)
- Act of electronic commerce and electronic signature
- Electronically commerce in public sector sub law
- Copy right Act
- Spatial planning Act
- Geodetically Legislation
- Environmental protection law

2.2. ORGANIZATIONAL ASPECTS

With the main tasks of national point of contact or SMCA, the organizational aspect of implementation INSPIRE directive is well defined. The SMCA is responsible for the basic data on physical space and real estate in the finalized databases and provides services pertaining to the registration of changes in physical space and on real estate properties, performs the role of a coordinator in the field of the real estate system and the spatial data infrastructure.

The SMCA should assure efficient maintaining of the data at each relevant authority, to avoid duplication of spatial data, to establish guidelines, national standards, integration, logistic and user support. To achieve these objectives cooperation and working together with public organizations and also private sectors dealing with geodata is necessary.

In cooperation with the Ministry of Finance, SMCA introduces mass real estate valuation with the objective of creating foundations for successful and efficient real estate administration and provision of data for objective and comprehensive real estate taxation as well as increased efficiency of the real estate market.

2.3. FINANCIAL ASPECTS

The SMCA made an estimation of financial costs for implementing and improving existing SDI. The costs for Slovenia are approaching 15 mio Eur until the year 2019. These costs include spatial data and services accommodation, creating new services, communication infrastructure, metadata preparation and some human resources costs.

2.4 REPORT ON PROVISION OF INFRASTRUCTURE FOR SPATIAL INFORMATION IN THE REPUBLIC OF SLOVENIA

In compliance with the Law on Infrastructure for Spatial Information, the Government of the Republic of Slovenia will send the Report on Provision of Infrastructure for Spatial Information to the European Commission by 15 May 2010. The first Report prepared by SMCA as the implementer of tasks of the national contact points is at the moment, in compliance with the law, in the interministerial proceeding and will soon be discussed by the Government and submitted to the European Commission. The Report presents current conditions in this field and the activities planned for the coming years. The Government of the Republic of Slovenia has not yet appointed an interministerial coordination group that would strategically coordinate work in this field. The Report presents a further organizational structure which, on the operational level, envisages the establishment of: Working group for legal regulations, Working group for standardization and harmonization of data, Working group for metadata and data integration and Working group for prototype solutions. It is not clear from the Report who the members of the individual working bodies are going to be but the structure of the interministerial coordination group that will be composed of 10 ministries is clearly specified. It is not clear from the Report whether the structures will include the representatives of the non-public sector but this would be more than useful in order to provide wider level of use for this infrastructure (SMCA, 2010).

3. PRESENT STATE OF NSDI IN SLOVENIA

INSPIRE directive is based on a number of common principles:

- Data should be collected only once and kept where it can be maintained most effectively.
- It should be possible to combine seamless spatial information from different sources across Europe and share it with many users and applications.
- It should be possible for information collected at one level/scale to be shared with all levels/scales; detailed for thorough investigations, general for strategic purposes.
- Geographic information needed for good governance at all levels should be readily and transparently available.
- Easy to find what geographic information is available, how it can be used to meet a particular need, and under which conditions it can be acquired and used

In order to be able to follow main principles of INSPRE directive the structure of NSDI is defined as: 'infrastructure for spatial information means metadata, spatial data sets and spatial data services; network services and technologies; agreements on sharing, access and use; and coordination and monitoring mechanisms, processes and procedures, established, operated or made available in accordance with this Directive.' (GSDI, 2010)

Each of these components serves as a cornerstone in establishing consistency and structure when it comes to documenting spatial data for everyday applications, as well as in building a distributed network of producers and users that facilitate data sharing.

3.1. EXISTING SPATIAL DATA

The main public organizations dealing with geodata in Slovenia are defined in a Report on provision of infrastructure for spatial information in the republic of Slovenia:

- MOP - Ministry of the Environment and Spatial Planning (www.mop.gov.si)
- SMCA - The Surveying and Mapping Authority of the Republic of Slovenia (www.gu.gov.si)
- EAS - Environmental Agency of the Republic of Slovenia (www.arso.gov.si)
- Ministry of Agriculture, Forestry and Food (www.mkgp.gov.si)
- Ministry of Transport (www.mzp.gov.si)
- Slovenian Roads Agency (www.dc.gov.si)
- Ministry of Health (www.mz.gov.si)
- Ministry of Interior (www.mnz.gov.si)
- Ministry of the Economy (www.mg.gov.si),
- Ministry of Public Administrations (www.mju.gov.si)
- Administration for civil protection and disaster relief (www.sos112.si)
- Ministry of Culture (www.mk.gov.si)
- Statistical Office of the Republic of Slovenia (http://www.surs.si/)
- SFS – Slovenia Forest Service (www.zgs.gov.si)
- Geological Survey of Slovenia (www.geo-zs.si)
- Geodetic Institute of Slovenia (www.geod-is.si)

- Biotechnical Faculty (www.bf.uni-lj.si)
- Fisheries Research Institute of Slovenia (www.zzrs.si)

Private sector
- Commercial data service providers

The article describes the data that are accessible through the Internet and maintained for the entire territory of Slovenia.

3.1.1. Data maintained by SMCA

The SMCA is responsible for most of data from Annex I and Annex II of the INSPIRE directive and also for some data from Annex III. The changes that will be needed to harmonize spatial data with INSPIRE interoperability framework depend on implementing rules – Data Specifications, which are in preparation.

Land Cadastre links real property rights on properties administered by the Land Register with the location in physical space. The graphic representation of parcel boundaries is provided in digital form represented by the digital cadastral maps. They show parcel and parcel parts boundaries, and parcel numbers. The data are referenced in the national coordinate system. They have been created for the entire territory of Slovenia.

The Building Cadastre is a basic record of data on buildings and parts of buildings, which links real property rights on buildings, administered by the Land Register, with the location in physical space. The basic units of the Building Cadastre are a building and a part of a building. Each building has one or more parts. In the Building Cadastre a building is recorded with its location and shape, and designated by the building number. The building's floor plan, the building height and the number of floors represent the location and shape of the building. Building cadastre is created for the entire territory of Slovenia.

Real Estate Register contains real estate data (title holder, building equipment, different actual uses, data about building characteristics, areas etc.) This register was established in year 2008 with purposes to amend existing data and ensure complete data on all real estate properties in Slovenia, ensure simple recording of the actual real estate situation and to create an open, multipurpose technical record of data on real estate. In Slovenia Supreme Court is responsible for Land Register. The Land Registry contains information about legal rights to real property objects, such as information about ownership, servitudes and mortgages.

Register of Spatial Units is based on integrated database that comprises location and attributes data on spatial units and on addresses for the whole country.

Consolidated Cadastre of Public Infrastructure administers the data on the objects of the public infrastructure owned by the state (state roads, water infrastructure, etc.), municipalities (water supply network, sewage system, waste dumps, etc.) and private companies (cable networks, telecommunication devices and networks, etc.)

Real Estate Market Register administers and updates the data on purchase and rental transactions with land parcels, buildings and parts of buildings. The data on legal transactions are submitted into the register by municipalities, administrative units, the Tax Administration of the Republic of Slovenia, real estate agencies and notaries public.

Vector database of topographic data of homogeneous accuracy and details appropriate for the 1:5000 scale is divided by objects into four areas (buildings, traffic, land cover, hydrography). The whole territory is also covered with topographic maps: basic (scale 1:5.000), national (scales 1:25.000 and 1:50.000), they are in analogue and digital form.

National general maps (scales from 1:250.000 to 1: 1.000.000) are available in printed form, digital vector form and raster form. The Generalized cartographic database was established in the period between 1994 and 1996 with data acquisition from scans of the national topographic maps at 1:25,000 and has been regularly updated since then. It comprises four groups of objects: roads, waters, contour lines and railways.

Digital elevation models with grid size of 5 m, 12,5 m, 25 m and 100 m are created for the whole country.

Orthophotos are created in black-white, color and near-infrared (NIR) technique and are covering the whole Slovenia. Resolution (ground sample distance) is 0,5m for black-white and color orthophotos and 1 m for NIR orthophotos.

Register of geographical names is created to meet three precision levels: for 1:5,000, 1:25,000 and 1:250,000 scales and is regularly updated. Also the names from maps at 1:25,000 and 1:250,000 scales have undergone toponomastic review.

In the field of **Reference system** the SMCA has started implementing the "Establishment of a GPS stations network and implementation of the European coordinate system in Slovenia" project that is subsided by a Norwegian financial mechanism.

Metadata. The SMCA administers and updates metadata for all geodetic databases. Metadata enables searching by data, providers thereof, areas of preparation; metadata contains descriptions of data characteristics, data accuracy, the method and frequency of database updating, etc.
Metadata system is available at http://prostor.gov.si/CEPP/index.jsp or at http://prostor.gov.si/cepp_eng/index.jsp when needed in English.

3.1.2. Data maintained by the Environmental Agency of the Republic of Slovenia

The Environmental Agency of the Republic of Slovenia (EAS) (http://www.arso.gov.si/) is a body of the Ministry of the Environment and Spatial Planning. Its mission is to monitor, analyze and forecast natural phenomena and processes in the environment, and to reduce natural threats to people and property. One of its tasks is to ensure high-quality environmental data for all target groups.

ATLAS OF SLOVENIA. Free access to the data maintained by EAS is available through the portal Environmental Atlas of Slovenia (http://gis.arso.gov.si/atlasokolja). Available data are covering the whole territory of Slovenia and are the following:

Monitoring points – national network of seismic stations, data on water quality, air quality stations, meteorological stations.

Environment – landfill of municipal waste, sensitive areas for eutrification, sensitive areas of bathing water with catchment areas, agglomerations.

Air quality – air quality evaluation zones, PM10 air quality areas, air pollution with SO2 and air quality zones for SO2.

Climate - air temperature, precipitation, snow cover, bright sunshine duration, wind speed.

Water - water permit, fish water segment, surface water bodies (lines and areas), categorization of watercourses regulation, water protection areas (divided into a national, municipal and commercial level), bathing water with catchment areas, groundwater bodies, hydrographic areas, river basins and flood waters.

Nature – valuable natural features, valuable natural features (Caves), ecologically important areas (Caves), national protected areas (points and areas), local protected areas (points and areas), areas appropriate for shellfish, living territory of a bear, Natura 2000, SPA extras, valuable natural features, ecologically important areas, zonation (protected areas), regional ZRSVN units.

Land and soil – research of soil pollution in Slovenia, Land slide probability (source: Geological Survey of Slovenia).

Earthquakes – earthquake catalogue, map of seismological risk.

For the background and for easier orientation some SMCA's layers are added:

- Infrastructure – state roads, EMF sources
- Spatial Units – national border, administrative units
- General maps

Metadata by standard ISO 19115 are available for all data maintained by EAS.

Beside the Atlas of Slovenia EAS maintains also EIONET-SI, an information and communication network. It supports collection and dissemination of environmental data. It is a part of EIONET network established by European Environment Agency (EEA). EIONET (Environmental Information and Observation Network) consists of the EEA itself, a number of European Topic Centers and a network of around 900 experts from 37 countries in over 300 national environment agencies and other bodies dealing with environmental information.

3.1.3. Data maintained by Statistical Office of the Republic of Slovenia

Statistical Office of the Republic of Slovenia is the main producer and coordinator of carrying out programs of statistical surveys. In addition to linking and coordinating the statistical system, it's most important tasks include international co-operation, determining methodological and classification standards, anticipating users' needs, collection, processing and dissemination of data, and taking care of data confidentiality.

In the scheme of organization of the Government of the Republic of Slovenia, the Statistical Office – which participates in budget discussions as an independent governmental institution – is directly responsible to the Prime Minister.

INTERACTIVE STATISTICAL ATLAS OF SLOVENIA (http://www.stat.si/) shows data for selected statistical indicators on interactive maps of Slovenian statistical regions and municipalities, mostly in longer time series. In the tool a user can select indicators, territorial levels (statistical regions or municipalities) and available years.

Atlas is based on data from **SI-STAT data portal** (http://www.stat.si/). Data are divided by fields of statistics. Within individual fields of statistics, links to all published statistical data are available by subject areas.

Data in SI-STAT portal are:

- Tables in PC-Axis format to allow direct inspection through a Web interface, a selection of categories to see, save in different formats and subscribe to notifications about new publications (information only for registered users). Links to other information published on the website of the Statistical Office (available publications data (XLS format).
- Links to the data available at the Bank of statistics.
- Links to websites of accredited program of statistical surveys, which are published statistics for the areas covered by approved contractors.
- Links to European statistics collected by Eurostat from national statistical offices of the Member States of the European Union and candidate countries

Fields of statistical data are:

Demography and social statistics – population, labor market, level of living, education, culture and sport, health, social protection, crime.

Economy – national accounts, prices, business entities, mining and manufacturing, distributive trade and other service activities, tourism, transport, information society, research and development, science and technology, external trade, business tendency.

Environmental and natural resources – territory and climate, agriculture and fishing, forestry and hunting, energy, environment.

General – general, administrative and territorial structure, elections, indicators.

3.1.4. Data maintained by Ministry of Agriculture, Forestry and Food

Spatial data maintained by Ministry of Agriculture, Forestry and Food are available through four different geo-portals:

eREGISTER KMETIJSKIH GOSPODARSTEV (eRKG, e-Register of Farms) (http://rkg.gov.si/GERK/eRKG/) - allows viewing of the farmer written and graphic information about their holding. Entering the application is possible only through digital certificates on-line. ERKG is a web application that allows Farmers to be reviewed their data from the register of agricultural holdings applications. The information contained in the application registry holdings are held in administrative units and containing the following databases in the field of agriculture:

- Register of agricultural holdings - farms
- Graphic records of land parcels of the farms
- Register of common pasture
- Records of hops
- Register of olive plantations
- Records of the orchards
- Record of extensive orchards and meadows
- Register of grape and wine producers.

Users of eRKG application are allowed to print information and extract data from the application.

Web portal KataKoma (kataster/komasacije: Cadastre/Land consolidation) (http://rkg.gov.si/GERK/) - application of spatial information provides an overview of land consolidation areas, and some bases.
Bases are the data maintained by SMCA:

- Orthophotos
- Land Cadastre
- data from the Register of Spatial Units

Spatial data maintained in the Ministry of Agriculture, Forestry and Food are:

- **GERK** - graphical unit of farm parcel
- **Land consolidation areas**

Web portal KatMeSiNa (http://rkg.gov.si/GERK/) - the application provides an overview of spatial information systems and cadastre, land reclamation facilities (systems and devices) and some bases
Bases are the data maintained by SMCA and EAS:

- Orthophotos (SMCA)
- Land Cadastre (SMCA)
- Topographic maps in a scale 1:50 000 (SMCA)
- data from the Register of Spatial Units (SMCA)
- Protected Areas (regional park, regional park, national parks, Natura 2000, water protected areas) (EAS)

Spatial data maintained in the Ministry of Agriculture, Forestry and Food are:

- **GERK** - graphical unit of farm parcel
- **Land use**

- **Land reclamation system** (divided to all systems and partially functioning systems)
- **Irrigation systems** (divided to all systems and partially functioning systems)
- **Drainage systems** (divided to all systems and partially functioning systems)

WEB PORTAL GERK/RABA (graphical unit of farm parcel/use) (http://rkg.gov.si/GERK/) - provides an overview of spatial data GERK and USE, and some bases. Bases are:

- data maintained by SMCA (orthophotos, cadastral maps, cadastral municipalities, digital elevation models, topographic maps, data from the Register of Spatial Units)
- data maintained by Slovenia Forest Service-SFS (forestry data)
- data maintained by Environmental Agency of the Republic of Slovenia (land and soil, water protection areas)

Spatial data maintained in the Ministry of Agriculture, Forestry and Food are:

- **Land Use** - the actual use of agricultural land is in digital graphic format, maintained on the basis of orthophoto, satellite imagery or other sources, by type of use (arable land, hop fields, vineyards, orchards, intensive, extensive orchards and olive plantations, permanent grassland, etc.).
- **GERK** - graphical unit of farm parcel means compact area of land with the same type of actual use that is in use of one agriculture holding and only one type of crops is growing on it.
- **Renewal of vineyards** (all renewal should be announced in advance)
- **Areas of limited opportunities for Agricultural activity** - hill and mountain areas, specific natural limits, etc.

3.2. ACCESS TO THE DATA

Access to the data is enabled through the information systems of authorities that are maintaining data. They comprise the production systems, which primarily obtain and process data, and the distribution systems, which distribute spatial data either directly into other information systems or to end users through e-services. Distribution systems were established on the user demands for up-to-date, high quality, standardized and quickly accessible geodata. The distribution systems enable a quick and secure access to interoperable data from various spatial databases.

As the SMCA is responsible for most of data of the INSPIRE directive access to its data is described in more detail. All data described in the article are accessible in a manner and under conditions similar to those described.

Access to geodetic data is enabled to numerous groups of users, both in terms of certificates, maps, plottings, extracts, online browsers, online data distribution, as well as providing certificates and information at customer service windows in all SMA locations. The infrastructure or web services was developed in line with the OGC recommendations and ISO standards and this enabled the development of new services for users and provides the standardized access to data (Ažman, I., Petek, T., 2009).

Electronic access to the data is available through a computer-supported distribution system that is based at the Ministry of Public Administration (MPA) as part of the national information system. Practically all the databases are included in the distribution environment: the Land Cadastre, the Building Cadastre, the Register of Spatial Units with Addresses, the Register of Geographical Names, geodetic points, the Real Estate Market Record, the Consolidated Cadastre of Public Infrastructure as well as the vector and raster topographic data. Their regular daily updating is provided.

The distribution system is separated from the production data, and as such it is as independent as possible of the systems and changes in the production, which is of the organization of data suppliers and changes in the manner of administration to data updating. Through the creation and use of special interfaces, online services and user applications, it enables a simple, secure, and correct use of geodetic data.

Electronically access to the geodetic data is enabled for its users in two ways: access to data and distribution of data (data transfer to the user's system). Free access to cartographic data is available via portal PROSTOR (means space) to all users, allowing them to search for a location and to display this location on the selected cartographic basis (orthophoto, a basic topographic map, national topographic maps, etc.) free of charge. Another public access is access to the latest registered data in the Land Cadastre, the Building Cadastre, the Register of Spatial Units, the Consolidated Cadastre of Public Infrastructure and real estate transactions on the basis of a real estate identifier (land parcel number, a building or part of a building number or an address). The service is free of charge and available for registered users at http://prostor.gov.si. In accordance with the legislation it is also possible to obtain data on the owner of real estate (land parcel or a building) on the basis of providing a real estate identifier. This service of access for registered users is intended primarily for users in public administration (national and local level), commercial users (real estate agents, lawyers, insurance agencies, banks, etc.) and land survey service providers.

The distribution of geodetic data is intended for the so-called registered users. Special online services, which enable a secure and controlled access, enable data transfer from the distribution system to the user's system. Online services enable access to digital data in line with standards and recommendations pertaining to the field of geographical information systems and online services, whereat taking into consideration the standards of SIST (the Slovenian Institute for Standardization), CEN (the European Committee for Standardization), and ISO (International Organization for Standardization) as well as the recommendations made by OGC and W3C (World Wide Web Consortium) (Ažman, I., Petek, T., 2009).

The basic web services are developed for the Land Cadastre, the Building Cadastre, and the Register of Spatial Units with House Numbers, the Consolidated Cadastre of Public Infrastructure, and the Real Estate Market Register. Simultaneously with the development of web services also the basic interoperability framework based on the XML and GML data exchange format are defined.

3.3. PURPOSES AND RIGHTS TO ACCESS AND USE THE DATA

Purposes and rights to access to the data are described in more details for the SMCA's data, since they are defined in strict compliance with the INSPIRE directive and the Slovenian Act on Spatial Data Infrastructure. Access to other data described in this article is free, or allowed to a certificated users.

The purposes of using geodetic data are:

- viewing geodetic data,
- use of geodetic data for public or private purpose,
- re-use of geodetic data.

Viewing geodetic data The public access link on the http://prostor.gov.si portal allows the users to use the free browser of the Land Cadastre, the Building Cadastre and the Register of Spatial Units data. The real property identifier allows browsing attribute and graphic data registered in the Land Cadastre, the Building Cadastre and the Register of Spatial Units. This kind of use is free for all users with Internet access.

Use of geodetic data for public or private purpose The use of geodetic data constitutes the use of data for their initial purpose for which the data were produced. The use of geodetic data for public or private purpose is access to data by public bodies (data sharing) and access to data by the owners of real properties. The data are free, only material costs can be charged.

Re-use of geodetic data is every use of data by natural or legal person for all purposes except viewing data and using data for the original purpose for which the data were produced. The re-use of geodetic data can be in three different ways:

- Ungainful re-use of geodetic data where the clients requesting data are natural persons - individuals, societies, nongovernmental organizations and other legal persons not involved in a gainful activity and which state that they are obtaining data which they will use for own purposes and not for re-selling data or selling products or services in which the data were used. The data are free, only material costs can be charged.
- Unchangeable gainful re-use of geodetic data. The re-use of data for a gainful purpose with the purpose of spreading information, ensuring freedom of expression, culture and art as well as the use of information by media. Only material costs are charged.
- Chargeable re-use of geodetic data for a gainful purpose is the use of data by natural or legal persons for a chargeable gainful purpose except for the purpose of spreading information, ensuring the freedom of expression, culture and art as well as the use of information by the media. The clients requesting data are natural and legal persons who state that they are obtaining data for re-use for a gainful purpose. Users must pay for the data and for the material costs too (Ažman, I., Petek, T., 2009).

4. ROLE OF THE PRIVATE SECTOR

NSDI implementation cannot be completed in a single phase. A so called layered approach needs to be adopted as ongoing work. Three layers - provision, content and governance - argue for local participation and the bottom-up approach, which are indeed important ingredients of SDI. The carriage and devices layers are fundamental for data exchange and communication, or as SDI Africa argues: "Partnerships and communication are the heart of SDI." (SDI Africa, 2010)

The fact is that NSDI can just not be implemented by government alone because a lot of enterprise/development activities are also done outside government domain. Private enterprise has to play a vital and complementary role - be it in solutions, be it in joint-venture initiatives with data-owners or in working the way ahead to deliver. Academic also have to provide advanced research of powerful spatial search engines, spatial data mining tools, modeling tools and many other research inputs (Rukund, M., 2007).

There is no common understanding of precisely what the term public private partnership (PPP) means. The concept of PPP cannot be standardized internationally since PPP initiatives must meet the policy objectives of individual governments, complement other public procurement approaches and service delivery methods and must be implemented in light of the available resources.

However PPP is, as defined by the UNECE (UNECE PPP, 2005), 'A partnership between a public organization and a private company which takes the form of a medium to long term relationship in which the partners have agreed to work closely together to deliver improvements to services in the interest of the public. There will be agreed arrangements for the sharing of risks, benefits and rewards and the utilization of multi-sector skills, expertise and finance. Such partnerships are usually encouraged and supported by government policy'.

PPP is not privatization; main difference is in a level of public control and oversight. It is not revolutionary, this approach is known mainly in the fields, like: transportation, water/wastewater, urban development, energy, financial management, schools (Asmat, A., 2008).

4.1. MAIN FACTS ON PPP

It is a general trend in Europe and worldwide that the private sector has increasingly been invited to take part in different activities in the field of geodesy, mapping, cadastre, land registry, land consolidation and land management. The aim has been to bring together the experience and skills of different partners in a way that guarantees the maximum benefit with the best practical and financial outcomes. Governments progressively turn to the private sector for additional resources as well as to capitalize on the private sector's efficiency, capacity and innovation. The extent of private-sector involvement needs to be carefully considered against each country's individual circumstances in order to find a reasonable and harmonized balance (Lipej, B., 2008)

It is argued that a PPP is a social partnership, as it includes not only the public sector but also organizations that are outside official boundaries, such as private sector,

academia and research institutes as well as non governmental organizations. These groups are all key stakeholders of NSDI. Therefore, this approach brings more stakeholders of NSDI on a unified platform as compared with other approaches.

4.1.1. Main strengths of partners

Private Sector Strengths are based mainly on the results of Market Competition and are the following:

- Management Efficiency
- Newer Technologies
- Workplace Efficiencies
- Cash Flow Management
- Personnel Development
- Shared Resources (Money)

Public sector strengths are based mainly on the results of serving the Public Trust and are:

- Legal Authority
- Protection of Procurement Policies
- Broad prospective/balance the competing goals to meet public needs
- Personnel – dedicated but constrained
- Capital resources

4.1.2. Main conditions for success of PPP

Statutory and Political Environment. A successful partnership can result only if there is commitment from the top. Public officials must be willing to be actively involved in supporting the concept of PPPs and taking a leadership role in the development of each given partnership. A well-informed political leader can play a critical role in minimizing misperceptions about the value to the public of an effectively developed partnership. Equally important, there should be a statutory foundation for the implementation of each partnership.

Public Sector's Organized Structure. Once a partnership has been established, the public-sector must remain actively involved in the project or program. On-going monitoring of the performance of the partnership is important in assuring its success. This monitoring should be done on a daily, weekly, monthly or quarterly basis for different aspects of each partnership

Detailed Business Plan (Contract). Involved parties must know what to expect of the partnership beforehand. A carefully developed plan will substantially increase the probability of success of the partnership. This plan most often will take the form of an extensive, detailed contract, clearly describing the responsibilities of both the public and private partners. In addition to attempting to foresee areas of respective responsibilities, a good plan or contract will include a clearly defined method of dispute resolution.

Guaranteed Revenue Stream. While the private partner may provide the initial funding for capital improvements, there must be a means of repayment of this investment over the long term of the partnership. The income stream can be generated by a variety and combination of sources (fees, tolls, shadow tolls, tax increment financing, or a wide range of additional options), but must be assured for the length of the partnership.

Stakeholder Support. More people will be affected by a partnership than just the public officials and the private-sector partner. Affected employees, the portions of the public receiving the service, the press, appropriate labor unions and relevant interest groups will all have opinions, and frequently significant misconceptions about a partnership and its value to all the public. It is important to communicate openly and candidly with these stakeholders to minimize potential resistance to establishing a partnership.

Careful selection of Partner. The lowest bid is not always the best choice for selecting a partner. The best value in a partner is critical in a long-term relationship that is central to a successful partnership. A candidate's experience in the specific area of partnerships being considered is an important factor in identifying the right partner (NCPPP, 2010).

4.1.3. Main advantages of PPP

Main advantages of PPP are political support, financial effects and data democratization.

Political Support
PPP brings political support as the public sector is part of this type of partnership and the need for sustained political support is required for NSDI implementation, because government leadership is essential to the SDI development process.

Finance
As in any developmental process, it is important to understand who the stakeholders are what roles each can play and how much finance, time and level of expertise is available. SDI implementation standard is that funding mechanisms must be in place if an SDI is to be implemented in a timely and efficient manner. Therefore, PPP will bring finance for NSDI implementation. Financial successful must be evaluated through many facts of public-private partnership:

- Maximizing the use of each sector's strength
- Reducing of development risk
- Reducing of public capital investment
- Mobilization of excess or underutilized assets
- Improvements on efficiencies/quicker completion
- Better environmental compliance
- Improvements of service to the community
- Improvements of cost effectiveness
- Sharing of resources
- Sharing / allocating of risks
- Mutual rewards

Data Democratization

Data democratization can be seen and envisioned as one of the ultimate goals of NSDI. Data sharing/exchange does not guarantee that every citizen will be able to access data/information with or without a fee. Because PPP includes federal, state, and local governments, NGOs, academia, research institutes and citizens as stakeholders, data democratization would enable a democratic environment for the data user community rather than a bureaucratic environment, which creates hurdles for data sharing, exchange and use. Simply said, NSDI development through the PPP approach has this added advantage. Therefore, PPP becomes the rationale not only for funding, sharing benefits and risks but also it would further development. Democratization of access to geospatial data thus enables value-added suppliers to create new data products and service (Nebert, D., 2004).

4.2. SITUATION IN THE FIELD OF PPP IN SLOVENIA IN RELATION TO NSDI

There is a perceptible trend in Slovenia to reduce public consumption. This is shown in reducing the number of public administration employees, in public procurements and in reducing the funds intended for maintenance and development of public infrastructure. However, the economic crisis has affected the private sector as well. A necessity of increased investments in development and of thoughtful investments into the future on one side, and a fight for survival on the other, strongly paralyse the companies.

PPP may be a partial solution for both sides, as division of costs and benefits is a strong argument to decide for a partnership. Thus it will be easier for the public administration to comply with the requirements set by the European Union, while work and existence will be secured for the private sector – with a preliminary financial input, of course.

The managers of various databases kept in Slovenia have established some of these databases by themselves and they hired the private sector to implement others. It is important to have confidence in the efficiency and quality level of implementation in such activities, as this is a pre-condition for further works.

In Slovenia, public sector on state, regional and local level often involves private sector in the set-up and maintenance of data and in the establishment and maintenance of services. The trend and legislative changes are going in that direction as well. All arrangements are made in accordance with the public procurement legislation. In that respect, many of INSPIRE data themes were set-up with the involvement of the private sector, like: geodetic and geographic reference systems, geographical names, administrative units, addresses, cadastral parcels, transport network, buildings, hydrography, elevation, orthophoto etc. Private sector is involved in setting-up and maintenance of metadata systems, data view, search and transfer services, web based services, web feature services, different portals. Public sector on his own has developed a few solutions for viewing data for the general public and for local authorities (Geopedia, Bioportal, PISO, iObčina).

In all these interactions, or at least in most described activities, there is no agreement on sharing of risks, benefits and rewards what is a value added component in the partnership (UNECE, 2005). There is a great desire to find a key for a real PPP in the

field of spatial and real estate data management, but a model is very hard to define and implement. The size of a country and it's population is one of the barriers that makes finding a workable solution even more difficult. The most reliable approach is under preparation in the municipality of Ljubljana for the arrangement of real estate records where it is interesting to mention that all payments for services provided will be executed after the real estate assets of municipality are going to be sold.

A lot of contents, leading solutions and strategies in the field of NSDI in Slovenia still need to be discussed and implemented, which means that a more organized approach to PPP is necessary in order to satisfy the needs of the European and Slovenian users within an appropriate time period and with the limited financial and staff capacities.

5. CONCLUSIONS

For the effective NSDI implementation there is a need to work more efficiently, effectively and economically and in doing so offer customer-oriented services. More cooperation is necessary, private private, public public and public private. The directive requirements are based on the interdisciplinary and integrating approach. Public and private sectors should operate according to the complementing and synergy principles which would result in high-quality foundation for PPP provision. There are respected European organizations, like EuroGeographics (European Association of National Mapping, Cadastral and land Registry Agencies) that has to take the lead role in facilitating the process and in supporting the countries for transferring best INSPIRE practices among them. Under development there are regional initiatives, like the one for the Western Balkan, Inspiration, which deals with the SDI implementation. In Slovenia a lot has already been done, but the activities should continue in more organized way. It would be advisable to include in the coordination INSPIRE structures appointed by the Government of the Republic of Slovenia the representatives of the users and stakeholders' societies. This is the way to balance the theoretical and practical forms of implementation of the directive in Slovenia and any other country.

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