Materiál Ministerstva vnitra

MINISTERSTVO VNITRA
ČESKÉ REPUBLIKY

Export z Národní architektury eGovernmentu ČR

Obsah

Spatial data and services over spatial data

Description of Spatial Data and Services over Spatial Data

The rapid development of ICT has enabled and provoked a much larger scope of work with spatial information and its use in the life of the whole society. This development imposes fundamentally new requirements for the regulation of the conditions for dealing with spatial data (data of which the necessary part is the data about the location in space, usually expressed in the form of coordinates and topology) and spatial information (information obtained by interpreting spatial data and the relationships between them). In view of the particular importance of spatial information, especially for the protection of the population, the prevention of natural disasters and the safeguarding of the environment, the European Commission proposed at the beginning of the 21st century to establish, in cooperation with individual Member States, an Infrastructure for Spatial Information (a set of principles, knowledge, institutional arrangements, technologies, data and human resources to enable the sharing and efficient use of spatial information and services) in the European Community called INSPIRE. The general rules for its establishment (by linking infrastructures for spatial information built and developed by individual Member States) were laid down by Directive 2007/2/EC of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), which was transposed into the Czech legal system by Act No. 380/2009 Coll, No. 123/1998 Coll., on the right to environmental information, as amended, and Act No. 200/1994 Coll., on surveying and on amending and supplementing certain acts related to its introduction, as amended. In the course of the implementation of the principles of the INSPIRE Directive into the national environment, it was confirmed that it is expedient to extend the INSPIRE principles beyond the 34 spatial data topics addressed by the INSPIRE Directive and to develop the National Infrastructure for Spatial Information (hereinafter referred to as 'NIPI') on their basis in a coordinated manner.

The public administration (central government authorities, local authorities, state security forces, IRS forces, etc.), professional self-government, research and educational institutions, the commercial sector, non-profit NGOs and citizens are involved in the development and use of the NIPI in different ways and to different extents, with the subjects concerned acting in one or more roles (owner, manager, operator, acquirer, user, etc.). Public administration plays an important role in the development of the NIPI, as a large amount of spatial data is generated in the processes of public administration agencies and information systems. The development of spatial data and services over spatial data and their use within the interconnected data stock is conditional on the standardisation of data models of spatial data produced by individual agencies and the standardisation of services over spatial data. The standardisation of NIPI services must be based as much as possible on existing international and European standards for spatial data and services over spatial data.

The acquisition and updating of spatial data used by public administration entities is a set of long-term, professional, technical, organisational and financially demanding tasks. Real and continuous changes in the territory, changing user requirements, the need for harmonisation of datasets at different levels of detail resolution, technology options and other influences enter into this long-term process.

The European Parliament's INSPIRE Directive, which specifies requirements for interoperable network services in implementing regulations, plays a crucial role in the provision of services for making spatial information available. The specification uses web services based on OGC standards - Web Map Service (WMS), Web Map Tile Service, Web Feature Service (WFS), Web Coverage Service, etc. Interoperability of spatial information services at national level can therefore be ensured relatively easily compared to the more time, capacity and cost intensive harmonisation of datasets. As a result, the network services required by INSPIRE are used within the national and European spatial information infrastructure, while the harmonised datasets are provided in parallel with the non-harmonised ones. The existing INSPIRE-compliant search (catalogue) services, browsing services, data download services and transformation services can be considered as key elements of the NIPI that already fulfil the basic objectives of making spatial information available and shared between otherwise heterogeneous IS. These services, like spatial information sets, are provided with metadata (data describing the structures and contents of spatial datasets, spatial services and other IS components; enabling and facilitating their discovery,

classification and use). The metadata is made available to service providers through a catalogue service according to the OGC CSW (Catalogue Service for Web) standard, which allows applications that can consume it to search the metadata, for example by so-called keywords.

Spatial Data Services

National Infrastructure for Spatial Information (NIPI): Commonly available services within the NIPI are services that allow metadata discovery and access (catalogue services), access to spatial data, most often for preview (usually referred to simplistically as map services); more recently, data download services (online or in the form of pre-built datasets) are also common. Less common, but still developing, are analytical services. The creation, management and updating of spatial data and making them available for preview or further use has a long tradition in the Czech Republic, supported by sustained user interest. These services are made available by the public administration, and less so by private companies. As in the case of spatial data, the definition of minimum requirements for these services or their anchoring in Czech legislation will be coordinated within the framework of the GeoInfoStrategy Action Plan.

NIPI diagram

Spatial data systems and services

Spatial Data Rules and Services over Spatial Data

The public administration uses spatial data in all agendas (and they are an integral part of them) that it provides, e.g. in the areas of transport, regional development, environmental protection, spatial planning, construction, agriculture, forestry, in addressing the tax needs of the state, in the field of property registration and management, for the protection of cultural heritage. Spatial data are of particular importance for state security, protection of the population, prevention of accidents and natural disasters and dealing with emergency situations. Up-to-date, uniform and rapidly accessible spatial data are essential for quality operational and crisis management at all levels.

In order to ensure the sharing and effective use of spatial data and information, it is necessary to establish an appropriate set of principles, knowledge, institutional arrangements, technologies, data and human resources, referred to as a spatial information infrastructure. In a number of countries, the National Infrastructure for Spatial Information (NIPI) is regulated and defined, in the Czech Republic a comprehensive, clear, systematic and formally anchored NIPI definition is still lacking, therefore at least a strategy for the development of this infrastructure has been established, see Strategy for the Development of Spatial Information Infrastructure in the Czech Republic until 2020.

In order to build the NIPI effectively, it is advisable to define, in addition to the central infrastructure elements and shared services, a standard functionality (at a general level) for an information system managing spatial data as part of the public administration information systems of the relevant public authority. As spatial data and services are merely a tool to support the performance of public administration agendas, both at the level of state administration and at the level of local government, it is essential to define the key consumers of the services provided in the form of agendas and activities (according to the terminology of the basic register of public authority agendas and certain rights and obligations) in order to define a general model at the level of business architecture. Obviously, the business layer will be different for each segment, but it has some common

features, especially in management, support and operational activities. In terms of supporting the so-called core activities, the link to the Register of Rights and Obligations is important, establishing certain competences for the performance of specific agendas in terms of the link to legislation and individual actors (participants).

The application of spatial data and services can therefore be found in all areas, typically, regardless of the specific segment, in:

- the formulation of strategic documents related in particular to the development of territories, services and segments (e.g. health, education, social services) or resource management,
- supporting the performance of public administration agendas related to e.g. spatial planning, construction, environment, transport, monuments, forestry or integrated rescue systems,
- asset management, in particular in the recording, maintenance and repair, investment (e.g. buildings, land, roads, greenery, infrastructure),
- planning control activities or risk management in the context of spatial contexts.

Business architecture also includes the identification of key stakeholders. External ones can include the public (individuals, natural persons doing business, legal entities), professionals, partners and suppliers. The internal ones include e.g. political representation, OVM management, employees performing specific agendas and activities, as well as representatives of the ICT unit as ICT (GIS) service providers. When describing the application architecture, in addition to the actual functionality related to the creation and management of spatial data, it is also necessary to focus on the sharing of data not only within the organisation itself, but also in relation to other public administration information systems.

The actual functionality of the spatial data management system consists, at a general level, in particular of:

- data creation and acquisition
- spatial data management
- metadata management
- data transformation
- visualization
- analysis
- workflow
- statistics and reporting
- INSPIRE data harmonisation
- print jobs
- opendata
- archive

For publishing and sharing, the key services are search, browse, download, transform and run services. In terms of internal integration with other elements of the organisation's ICT infrastructure, integrations to:

- Agency information systems (e.g. construction and land-use management, state forest administration, heritage conservation), where GIS helps especially with visualizing agency data in a map, visualizing contexts or trends, and thematizing them.
- Electronic filing system, including the filing cabinet; the relationship between the filing service and the digital filing cabinet and the GIS is generally not implemented, although many inputs and outputs from the GIS are documentary in nature in the context of Act No. 499/2004 Coll. and the national standard (NSESSS). In such cases, the GIS acts as a separate record of documents, however, it does not respect the relevant legislative obligations. One possible solution is to implement a link to the filing service.
- Asset management and investment management, where assets are primarily recorded and managed in the ERP (usually in interlinked modules for asset recording and maintenance and investment management with a link to accounting records and budget). Key to asset management is the land registry data (held in ISKN) containing both descriptive and graphical components. This ISKN data is usually updated in batches at regular intervals (however, the remote access web services of the land registry of the Czech Land Registry can also be used), and there is often duplication of data management (including regular updates) also in the GIS. It is optimal to ensure common management of reference data, to ensure their sharing and mutual iteration at the client level.

Key, from the perspective of external integration to shared eGovernment elements, include:

- Register of Territorial Identification, Addresses and Real Estate
- Land Registry Information System
- National geoportal INSPIRE
- Digital Technical Map of the Czech Republic (IS DMVS)
- Building Identification Number Information System

spatial data, nipi, geoportal, inspire, dtm, digital, technical, map, geoinfostrategie

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Last update: **2021/06/01 13:12**