Process Modeling for Regional Territorial Planning

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Abstract: - Each organization needs to manage quality of its production processes; that applies for both production of products and provision of services. Commercial organizations apply process management methods, because they accept it as necessity in light of long-term high performance achievements. Services of public administration are not yet process managed; that is not because public administration organizations would not be interested in application of methods of monitoring and managing quality. The reason is that the services they provide have specific characteristics. That applies also for map services concerning regional territorial planning. This article focuses on possibilities of usage of process modeling in the area of regional territorial planning, so that these services could be process managed and monitored.

Key-Words: - regional territorial planning, spatial decision making, process modeling, data modeling

1 Introduction
Solving spatially oriented problems and making spatially influenced decision have been recognized as highly important for several years. The corresponding decision making is considered by solving spatial problems; the interest of managers and users in utilization of spatial information and services increases rapidly. The environment impact assessment [6], environment protection [5] and route planning belong to significant branches of spatial decision making [10]. In context of territorial planning, organizational units are municipalities, regions or state and on all these levels decision making about territory takes place. Approved documents which decide about the utilization of territory have long-term characteristics, while the amount of financial resources in this area is very high. Opinions and comments of citizens involved, attitudes of involved municipalities, districts and other involved institutions are important for final decision about form of documentation and must be included in the final documentation, therefore, they become a part of the decision making process [2].
Territorial planning has, above all, regulative function. It mainly sets rules and frameworks for actions of territorial development subjects; it also supports private investments by offering suitable development areas, while these private investments are vital for regional prosperity [12]. Territorial planning is a process; it is, therefore, a permanent activity which complexly solves functional usage of territory, objectively and timely coordinates building and other activities influencing development of particular territory. Further, it ensures harmony among all natural, cultural and civilization values within the territory, emphasizes protection of all elements of environment [19].

Goals of territorial planning - by legislative [4] are: ensuring prerequisites for sustainable territorial development; coordination of public and private projects of changes in the territory; protection and development of natural, cultural and civilization values of the territory. Territorial planning evaluates policy of regional development so that balanced relation of territorial conditions is created for favorable environment, economic development and consistency of society of territorial citizens.
Territorial planning includes following tasks [19]:
• to find out and evaluate status of the territory; its natural, cultural and civilization values;
• to set concept of territorial development including urbanistic concept with consideration of territorial conditions.

Territorial policy on the European Union level is coordinated in compliance with strategic document ‘European Spatial Development Perspective’. Tools for territorial planning are then delimited by legal norms. ‘Territorial-analytic data’ can be considered to be the ‘default’ tool which is also the input for ‘Principles of territorial development’.

The process of creating territorial analytic data and also the process of creating the principles of
territorial development is represented by repeated instances [9]. Those are creation of significant documents including map data which are used not only by managers for managing the region as a whole, but also by managers within municipalities. That is why it is suitable to use process management tools for managing these processes.

The article addresses application of process and data modeling in regional territorial planning with special focus on creation of territorial analytic data.

2 Process management for territorial planning

In the area of public administration authorities the process approach is declared within various strategic documents, such as Strategy Smart Administration [15]. However, the reality is different, the role of the process management is underrated often [3]. The goal is to remove redundant and non-effective steps at processes, which are executed in public administration and to create conditions for efficient and rational use of all tools supporting performance of public administration.

2.1 Tools of territorial planning

The base for process management is process modeling. Modeling business processes is necessary for an enterprise that desires to evaluate, improve, migrate to a different technological platform, automate, and/or document its business processes [1] [8]. Process models are essential information base for monitoring processes output.

It is possible to distinguish various actors of territorial planning. It is more suitable to stem from legislative delimitation of actors for the need of process models [4] [19] – producer of territorial planning documentation or territorial planning data; processor; concerned authorities, public, regional council. The set of territorial planning tools is delimited by legislation in course of analysis of these tools we can conclude following general characteristics [18] - tool / document consists of a defined set of files (text data and map publications); documents are created and approved by various actors; in some cases of documents it could even be a wide range of actors; documents concur one on another in sense that certain document can be input data for creating another document; documents are created in regular intervals or modified in irregular intervals.

The initial question was which process of document creation we should focus on and on which process or on which processes it would be suitable to apply methods of process modeling and data modeling.

Fig. 1: Tools of process modeling

2.2 Modeling approach, metrics

Modeling is a thought abstraction, a reproduction of real existing system via special-constructed models [16]. Business process models were designed to help document, communicate, or improve organization’s business processes. One key factor reported for obtaining a high quality business process models is the active participation of all the stakeholders that ensures the development of a shared vision of the business processes [14]. The graphical tools of business process modeling are for example [11] [17] (see figure 1) – hierarchical diagram (top-down decomposition of model domain from higher levels to lower ones), diagram of process context (interception of all the significant process contexts) and process map (event-driven process chain diagram; overview of activities induced by events).

Fig. 2: Data flow diagram as a tool of data modeling

Besides modeling of the process flow, it is efficient to monitor data flows within individual functionalities of the process. The suitable tool for creating such a model is for example data flow diagram [7], by means of which we can capture processes and sub-processes, flows of data and events, data repository and also influence of external actors (see Figure 2). Simultaneously with the development of models it is necessary to define
appropriate metrics. Metrics are used for evaluation and measuring of performance, whether the area is corporate-wide or concrete partial. Metrics is a measurable indicator used for determination of quality, quantity and financial category; it is an indicator of quality in the light of set goals [20] [21] [22]. Objectively measured measures (hard measures) are characterized as objectively and easily measurable indicators. They monitor for example development of corporate goals and they are focused on the output of corporate processes, key activities, or they are focused directly on customer [13] [21]. Subjective measures (soft measures) cannot be measured directly objectively, but they lean on subjective evaluation for example in form of questionnaires.

3 Models for selected process of regional territorial planning

The procedure of process modeling for support of regional territorial planning had several phases.

3.1 Selection of a modeled topical area

In order to select a suitable process, the initial requirement was that the process should be in competency of a single public administration authority, for example in competency of a regional authority. Another requirement was to analyze both regular process execution (regularly in certain interval) and irregular process execution (irregularly, according to needs or on demand). Based on these requirements, a process related to creation of so-called ‘Territorial analytic data’ was selected. The process can be characterized:

- Actors of the process are external providers of data and the processor (regional authority); of course there are also actors in roles of approvers or subscribers of given data.
- The process is carried out once in two years in order to create new territorial analytic data and several times during this period for update of current territorial analytic data.
- Territorial analytic data are significant input for creation of significant tool of territorial planning, which is ‘Principles of territorial development’.

3.2 Creation of process models

For mapping the process of creating territorial analytic data creation of following models was selected – model of process context and model of individual activities within process. It proved suitable to divide monitored topical area into two alternatives. The first alternative represents regular execution (once per two years) in course of creation of new territorial analytic data, while this interval is given by legislation. The other alternative is irregular execution, when data are updated continuously (within given 2-year period). The model of the process context is in Figure 3.

![Fig. 3: Model of process context (territorial analytical data, TAD)](image)

The two models of process execution were designed; one model for creation of new territorial analytic data and another model for continuous update of territorial analytic data (see Figure 4).

For mapping these two process alternatives, following characteristics were evaluated:

- Input data: the most risky area in the process is obtaining input data; data from providers are supplied in digital form, also in paper form; supplied data do not have unified format (.SHP).
- Output data: the output is also an input to the process of creating the Principles of territorial development; regional authority council takes the documents into account.

3.3 Data model and setting of indicators

It was evaluated that the most risky part is obtaining and processing of data. The process of creation of territorial analytic data takes place in the initial
phase of the whole process of tool creation for territorial planning. Simultaneously, documents of territorial analytic data are a significant input for creation of the Principles of territorial development and, therefore, they influence the quality of other subsequent documents.

The quality of documents influences territorial planning in the region, while these documents and map publications serve as support for regional decision making of managers and all other stakeholders. Input data for the process of creation territorial analytic data are obtained from providers (for example gasworks, power plant and others). These are organizations within the region that provide their monitored events. Organizations are not forced by means of legislation to present their data in certain format, so the characteristics of supplied data are as follows:

- Method of delivering data: portal, mail delivery.
- Data format: digital format (SHP and other such as .DGN, .PDF, .DOC) or paper format.

The quality of input data, especially unification of input data, is a significant area in the process as well as in data flow (see Figure 5). That is why further attention was focussed on functionality ‘Data modification’. The goal was to set a suitable set of indicators which could be monitored and evaluated; those indicators should lead to improving the quality of given activity. Based on the analysis and consequent consultations with specialists from regional authority, a set of indicators has been determined – format, reception of message, additional communication, time of study through data model and conversion of attribute.

Further process was designed as follows - measuring by means of designed indicators will take place; suitability of designed indicators will be evaluated and eventual indicators will be amended with additional suggestions; new measuring takes place. These are measuring that will be executed during 2-year period. The expected number of updates is very low (it is presumed that there will be several updates of each event monitored – for example three updates). Nevertheless, even this low number of monitored updates will valuable feedback and allow to design measures to speed up activities monitored.

4 Conclusion

The article focused on possibility of utilization of process analysis and process modeling for the service of regional territorial planning. Specifics of particular public administration service are
constituted by the interval between individual executions of the service; length of the interval can be 2 years. Another specific is the number of actors who influence given service (creators, approvers, superior constituents, land owners and others). Process analysis and process modeling was focused on the initial phases of the whole process of strategic tools creation; that means processes related to creation of territorial analytic data. The tools of process and data modeling were used for modeling. Risk activities and areas for improvement were identified in the created models. The created models were repeatedly verified by specialists and managers operating in the area of territorial planning. Process analysis and process modeling showed to be suitable tools for managing processes of regional territorial planning.

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