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BUSINESS PROCESS ANALYSIS AND SIMULATION USING THE OBA AND BORM METHOD AND THEIR ROLE IN MODELING

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Abstract
One of the actual and specific problems in the Czech landscape is very low level of participation and technophobia of citizens from small settlements in rural areas. This paper presents the role of the OBA method as the vital preparative technique performed before the subsequent business process analysis, design and simulation of local government processes and country planning. We practically experienced, that this approach saves time and improves the validity and correctness of the decision making in specific conditions of country planning management.

Key words: business process modeling, organizational modeling and simulation, OBA, BORM, technophobia, participation

INTRODUCTION

Nowadays we have to solve many problems related to the small settlement development and expansion, landscape care and over-all efforts to improve the quality of life and the level of democracy while preserving the conditions of the sustainable development (addressing living standard, cultural and historic value, agricultural and industrial production, transport infrastructure construction, tourism potential, etc.). Technophobia of local people is here the significant factor for growing of this problem, because it is strongly contrasting with incoming investors and external people penetrating the rural area using good ICT (especially GIS and project management software) knowledge.

Business process models show and animate (when they are simulated) the collaboration of more participants within the solved system. We need this approach for simulation, validation and verification the real world problems. This issue is stressed in specific areas of technical systems analysis and design in area of agriculture, landscape management and country planning. A very important purpose of such a business model is to create and simulate an interconnected complex system where local actors, citizens, regional government, various interested organizations and partners and other participants mutually communicate. In addition to that, business process models are also the foundation of subsequent system modeling activities of software engineering, organizational design and management consulting. Typical way of performing these activities is to start directly with drawing process diagrams just during the initial interviews. But in this paper, we present the idea, that for better modeling, we need to use a specific textual technique, which helps us to recognize, define and refine our initial set of business process participants and their properties before the graphical business process model is assembled.

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MOTIVATION

Expected output of the business process modeling and simulation activities is information or data in a form that can be directly used as an

input for implementation of the system in the spirit of software engineering and organizational modeling and management consulting. However, this is not the easy case; there are following issues described by Illgen and Hulin and Van der Aalst in [1]:

1. oversimplification - while trying to at least finish business and organizational model we are forced simplify the problem being modeled and
2. inability - some important details cannot be recorded because of the method being poorly used.

A perennial problem with the development of business systems is the communication gap that exists between analysts and domain experts; each live in their own well defined and complex cultures. One place where this gap manifests itself is in the constant failure of simulation model designers to fully capture the requirements of any proposed business system. In our experience, gathered during the last ten years working on major projects, not all system requirements are known at the start of the project, and the customer expects that their discovery and refinement will form part of the project. This problem is complicated further, since the function of any major system developed has a significant impact on the very organizational and management structure of the company or organization where the system is to be implemented. Examples include the creation of new or the modification of existing job positions, significant changes in the management structure, creation of new departments, etc.

OUR APPROACH

Business Object Relation Modeling (BORM) is an approach to both process modeling and the subsequent development of information systems. It provides an approach that facilitates the description of how real business systems evolve, change and behave. BORM - Business Object Relation Modeling was originally developed in 1993 and was intended to provide seamless support for the building of object oriented software systems based on pure object-oriented languages, databases and distributed environments. Subsequently, it has been realized that this method has significant potential in business process modeling and other related business issues.

The BORM development methodology starts from an informal problem specification and provides both methods and techniques, to enable this informal specification to be transformed into an initial set of interacting objects. The main technique used here is modified form of Object Behavior Analysis (OBA) being firstly published by Goldberg in [14]. BORM modified Object Behavioral Analysis (OBA) [7, 11, 18] which is a step-by-step iterative approach to analysis.

Our Project

We analyzed the legislation and local officials' knowledge related to the processes and agendas of the urban planning of the landscape areas and small settlements with regards to the new housing and building law and regional management trends in the European Union. Our project has been run in 13 small settlements in the Central Bohemian area and was tested by 57 people from these villages. In the result, 95% of people evaluated this approach as useful tool for breaking technophobia barriers of local officials in order to improve quality of local life via better opportunities for local people to negotiate with outside interests, which often misused their low knowledge for private interests having the negative urban-sprawl impact on the countryside and rural landscape. [8, 10]

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Our approach using process models and their visual simulation helps the officials (especially in the smallest settlements) to clarify the legislation and shows them possible ways of its usage. Our models and their visual simulation show how the BORM can be used to improve the process of decision-making on the level of mayors and local administrations. It offers the possibility to model and simulate real life situations in small settlements. The example at the **Figure 1** shows the BORM business object diagram of a process of starting urban plan. Our modeling software shows the concrete simulation step. A diagram is a visual representation of object associations and communications in a particular process. Our notation is the re-used UML notation [7] from the state diagram, activity diagram and sequence

diagram UML [19] but combined and simplified into the only one new diagram that shows the process as object-oriented participants in the form of mutually communicating Finite-State-Machines [4,15]. Moreover, we can use a visual simulator in order to animate these processes and evaluate them. Our simulator has included the communication module inspired by Facebook-like chatting. them within a group of users **(Figure 2).**

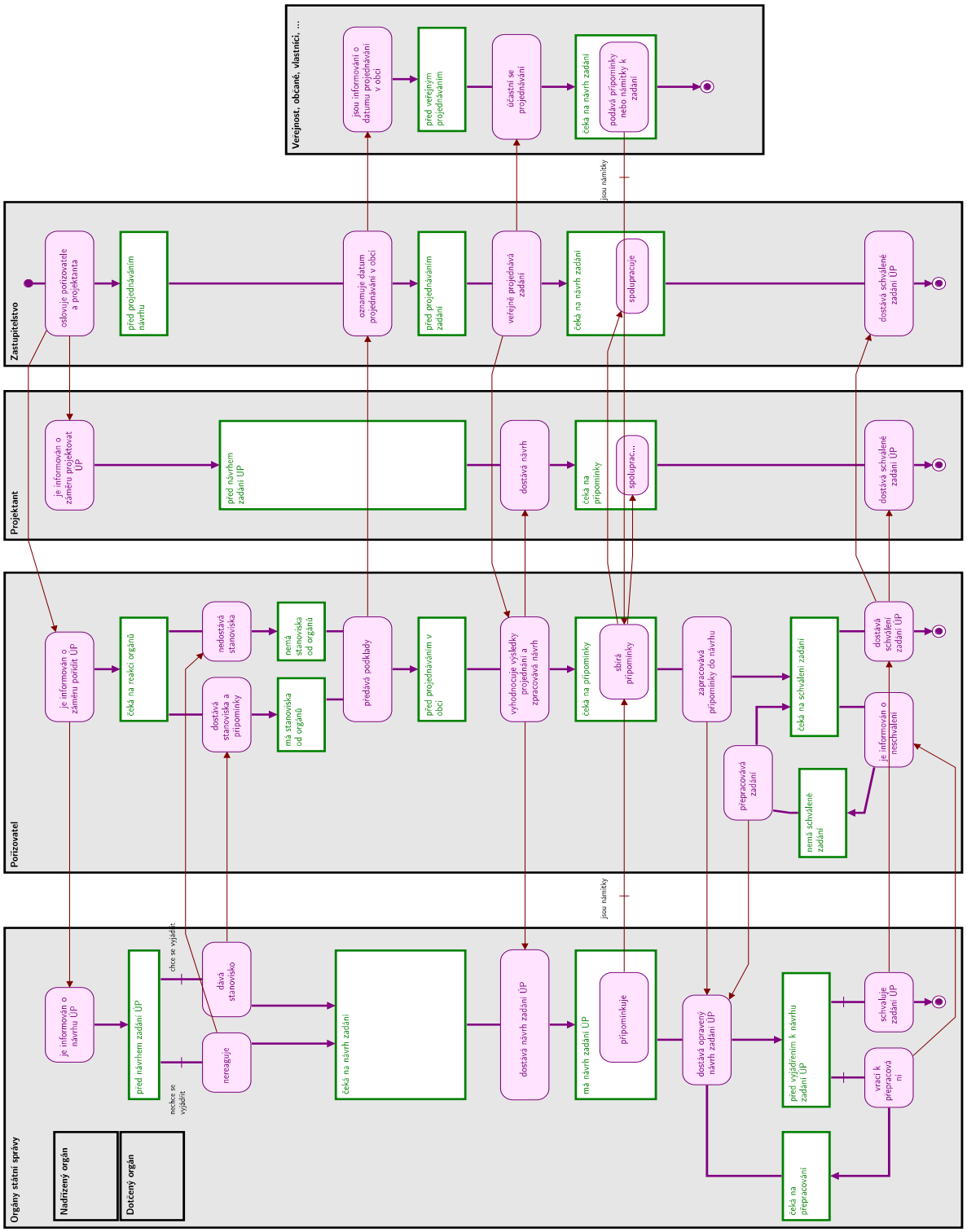

Figure 1. Urban planning process

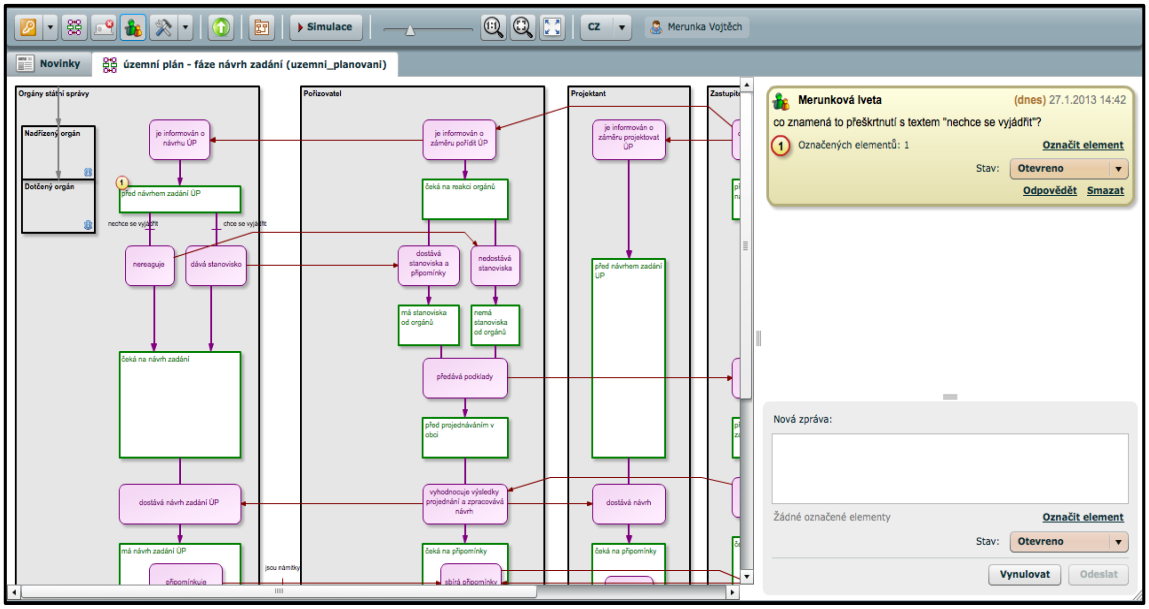

Figure 2. Communication of users during the process simulation

OUR EXPERIENCE

Target staff is typically not educated in any computer science-related techniques. (Even if they are university teachers) On the other hand, the process-mapping phase must be performed quickly. This is why the analysis team does not have any time for detailed modeling courses such as the explanation of all aspects of used method with consequences into software engineering. Courses on CASE tool are also inappropriate here. There is time only for a very little introductory session about subset of used tools and techniques. In our experience, one of big advantages of OBA technique is fact that it requires only 20 minutes introductory session. After this very short introduction we are able to start the workshops.

Workshops that put together teams and experts are the best tools how to facilitate and speed up the modeling. Consulting team members should precisely perform three independent roles:

1. Problem domain expert, who is responsible for querying and best practices knowledge.
2. Methodology expert, who is responsible for functions, scenarios and diagram consistency because of problem domain people often tend to confuse modeling concepts, do not respect the scenario borders and cross from one process to another.
3. Project-Relationship Manager, who knows personal names and personalities of all target staff team members, who watches them, who is able to initiate the particular discussions or countdown some debates, for example.

CONCLUSION

In this paper we presented the approach to modeling and simulation of business requirements in order to meet specific requirements of law-based socio-technical processes of country planning.

Our project described in this paper was about the organizational modeling and simulation as a tool for improvement the decision-making on the level of mayors and local administrations. It offers the possibility to model and simulate real life situations in small settlements. The project activities were for modeling, simulation and reengineering processes related to the regional government processes of small towns and villages, and the subsequent development of supporting information systems addressing better life situations of local people.

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