Chapter 2.9
A Design Tool for Business Process Design and Representation

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ABSTRACT

In this chapter the focus is on business process design as middle point between requirement elicitation and implementation of a Web information system. We face both the problem of the notation to adopt in order to represent in a simple way the business process and the problem of a formal representation, in a machine-readable format, of the design. We adopt Semantic Web technology to represent process and we explain how this technology has been used to reach our goals.

INTRODUCTION

Today, the impact of business processes within companies gains more and more importance and provides tools to the managers, and methodologies useful to understand and manage them are a must. It is important to integrate business processes in the overall information system (IS) architecture with the goal to provide, to the managers, the right flexibility, to avoid the reimplementation of the applications in order to follow the business process changes, and to adapt the existing applications to a different management of the existing business logic. As a consequence the process-oriented management requires both the ability to define processes and the ability to map them in the underlying system taking into consideration the existence of heterogeneous systems.

It is clear that business and information technology (IT) experts must work together to provide the right flexibility to the IS and thus to improve the overall management. The semantic gap between business and IT experts is a problem in the development of an overall system oriented

to the improvement of the business process. The first thing to do to solve this problem is to study a common language between these two classes of users with very different requirements:

- Business experts will focus on the processes and on the direct management of them in order to modify the company work without giving many technical details: A change to the process must be immediately translated in a change to the applications that implement it.
- IT experts require more details about processes and require simplicity in order to understand the process flow and thus application requirements.

Business process design is the middle point between requirement elicitation and Web IS implementation that is between business and IT experts. The tool that supports business process design must be the same for both business and IT users and must answer to two different key aspects:

- easy to use with a notation easy to understand and allows to gives all technical details but, at the same time, hiding the complexity to the final user, and
- supports the export of the process design in a formal way in order to give to the IT experts all the process detail that they need. The process description must be machine readable.

In our research work we consider these two aspects by two approaches:

- the use of a standard notation for business process representation, and
- the use of an ontological language that, thanks to its flexibility and machine-readable feature, is able to express all process complexity in a formal way.

In the next section of this chapter we explain the background about the concept of business process management (BPM) and the analysis of several BPM suites, and then we explain the open issue and the possible solutions related to the BPM suites. Next, we present our approach to the business process representation and we provide an overview about business process management notation (BPMN), Semantic Web languages, and about the concept of the metamodel. In the next section we explain what metamodel means and what the main problems are in the meta object facility (MOF) approach. In the section: *BPMN Ontological Metamodel: Our Approach to Solve MOF Problems* we explain how to solve problems about the classical metamodel approach with the use of the Web Ontology Language (OWL) and then, in the next section, we explain the steps followed to develop the ontological metamodel. Finally, we highlight the future trends about our research work and the conclusions.

BACKGROUND

Since the 1990s, process management has gained more and more importance in companies. Process management began to affirm with the *business process reengineering (BPR) theory* (Hammer, 1990) that allows us to improve company management thanks to the analysis and redefinition of the company's processes. BPR theory does not give a structured approach to the introduction of the process in the overall IS architecture but the process logic was in the mind of IT experts that were free to implement them.

Starting from BPR, the evolution was workflow idea (proposed and supported by Workflow Management Coalition [http://www.wfmc.org]), which is the automation of some companies' processes where only people performed process steps. BPR theory and workflow idea allow to take into consideration vertical processes involving a single company department, but process, usually, covers

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