Chapter 4.12
Semantic Business Process Management:
A Case Study

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ABSTRACT

The application of semantic technologies promises boosting business process management because semantic integration of business and IT is achieved. To enable the vision of semantic business process management, semantic technologies like ontologies, reasoners, and semantic Web services must be integrated in BPM tools. We extended a professional BPM tool to allow semantic business process modelling using the EPC notation. In addition, we adapted the tool's EPC to BPEL transformation to preserve the semantic annotations. By introducing a proxy service, we are able to perform Semantic Web service discovery on a standard BPEL engine. We evaluated our approach in an empirical case study, which was replicated 13 times by 17 participants from 8 different organisations. We received valuable feedback, which is interesting for researchers and practitioners trying to bring semantic technologies to end-users with no or only limited background knowledge about semantics.

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INTRODUCTION

Business processes are a core asset of every company. They govern how employees, departments,

and resources collaborate to create business value and to adapt to changing market conditions. Today, business processes are often supported or even automated by a combination of IT systems. The IT implementation of business processes is hindered due to the business-IT divide (Smith & Fingar, 2003; Dehnert & van der Aalst, 2004; Koehler, Hauser, Sendal, & Wahler, 2005). Business processes are designed by business experts with no IT knowledge. On the other hand, IT implementation is done by IT experts, who do not have the necessary business knowledge to correctly interpret the business process models. To overcome this business-IT divide it is suggested to use semantic technologies like ontologies, reasoners, and semantic web services (Hepp, Leymann, Domingue, Wahler, & Fensel, 2005).

Even though the use of semantics in business process management (BPM) promises many advantages, an empirical evaluation is still missing. Therefore, we[1] first created a semantic business process management (sBPM) prototype to allow using semantics while implementing business processes. Afterwards, we conducted an empirical case study with participants from industry and research to evaluate this prototype.

In this chapter, we report on the technical details of the sBPM prototype as well as on the empirical evaluation. The chapter is structured as follows: First, we[1] provide background information by explaining the basic concepts of BPM and sBPM in section 2. Section 3 describes the research design and the research question. The case study is based on a sBPM prototype. The two parts of it are described in section 4 and section 5. Section 6 introduces the different parts of the case study like the real-world business process used, the participants involved, and the interviews conducted. The results of the case study are presented and discussed in section 7. The chapter is concluded with a summary.

BACKGROUND

Business Process Management

In general system theory (von Bertalanffy, 1976) a system is defined by its border, by its goal or purpose, by its elements, and by the relations between those elements. An enterprise is such a system, because it fulfils all those characteristics. An enterprise has a border to the environment (customers, competitors, market). It also has a goal like creating a high return on investment or maximizing the shareholder value. An enterprise consists of many elements and the relations between those elements. During its lifetime, the enterprise is restructuring itself in order to adapt itself to a changing environment. An enterprise model captures all relevant aspects of the enterprise. It is created to document the structural and dynamic aspects of the enterprise, but also to plan and communicate possible changes internally and externally. The structural elements of the enterprise model are grouped according to their nature into different dimensions like organisational elements, functional elements, data elements, etc. Different diagram types are used to model the static relations between elements of the same dimension. For example, an organisational chart is used to model the formal hierarchy within the enterprise. In contrast, dynamic models define how the different system elements of the enterprise work together to achieve the enterprise's goals. Those dynamic models are called business processes, workflow processes or executable processes depending on their purpose and level of abstraction. The enterprise model is usually structured according to an enterprise architecture framework like Zachman[2], ArchiMate[3] or ARIS (Scheer, 2002; Scheer, Thomas, & Adam, 2005). Such an enterprise architecture framework defines the dimensions, abstraction levels, possible element types, and relation types.