

Semantics and Web 2.0 Technologies to Support Business Process Management

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Business Process Management (BPM) is a field of knowledge at the intersection of management and information technology, marking a core subject of Business and Information Systems Engineering (BISE). Thus, on one hand, BPM shows how to design an enterprise model (or enterprise architecture), including organizational structure, strategy, and process landscape. On the other hand, it encompasses methods, techniques, and tools to design, enact, and analyze business processes.

Nowadays, BPM is often combined with the Service Oriented Architecture (SOA) paradigm. Whereas BPM specifies how the organizational resources (including IT resources) are used to achieve the business goals, SOA focuses on the IT architectures that are intended to be conveniently adapted to changing business requirements.

Despite the promising perspective offered by combining BPM and SOA, various challenges remain. Some of them are connected with a different perception and understanding of a process held by a variety of actors involved in the BPM lifecycle. A good example of a communication problem between the various groups of actors constitutes the so-called business/IT divide. This is exemplified by an IT engineer interpreting a process model because of its insufficient description provided by a business analyst.

Using different terminology is inherent not only to various groups of users, but also occurs within a given group e.g. of business analysts applying different labels to describe the same artifacts. This may lead to serious problems in sharing, discovering, and reusing the already modeled processes as well as it hampers the effective collaboration in the process modeling phase. The lack of a common conceptualization and consistent terminology also hinders the automated transition between phases of the BPM lifecycle.

Another issue concerns the support for performing changes, i.e. the flexibility of BPM systems. For instance, many existing BPM execution environments do not allow for dynamic binding of services, making the processes less flexible and less adjustable to changing requirements. In addition, the lack of standardized high-level services increases the effort and the risk of replacing an existing component.

In the light of the above exemplary shortcomings, researchers are investigating the possible application of new emerging technologies, i.e. Semantic Web and Web 2.0 technologies, to bring BPM to the next level.

Being overloaded already, the notion of semantics covers a further aspect within the context of so-called “semantic technologies”. A technology is characterized as “semantic” if it is based on an approach that is aimed at formalizing semantics for the purpose of increasing software capabilities. In software engineering, the explicit specification of data semantics through the use of schemata has been an important instrument to reduce complexity and to foster flexibility for a long time. In contrast to these approaches, the field of semantic technologies, which emerged from artificial intelligence research, mainly focuses on the use and development of languages that allow for deduction—thereby supporting a higher level of abstraction and more meaningful specifications.

In turn, the term Web 2.0 is used to describe applications that take advantage of the network nature of the Web, encourage participation of community members and are inherently social and open. From the BPM perspective, the most important feature of Web 2.0 technologies is that they aim at enhancing information sharing as well as fostering collaboration. Thus, they are suitable to promote communication in the context of BPM—hence, to support various stakeholder in participating in analysis and design processes.

At first, it was unclear whether semantics and Web 2.0 technologies in BPM compete or complement each other. The approaches differ in their respective objectives and focus. Whereas Web 2.0 describes an overall approach of incorporating users into the design of processes and implementation of IT systems, concentrating on knowledge sharing and collaboration, semantic technologies focus on shared vocabulary, formalized, and machine-processable metadata with automation as the main objective. In

addition, looking at the origins of the Semantic Web and Web 2.0 concepts, we note several differences. The most important one is that while the Semantic Web focuses on machines by providing machine-processable information, Web 2.0 focuses on humans mostly by providing efficient platforms for information sharing. The special focus of this issue is aimed at the question whether and how both approaches can be combined synergetically.

In their paper, Holschke, Rake, Offermann, and Bub address the problem of software support for business process change. They show how the platform based method operating on semantic descriptions may be used to adjust business processes built in accordance with the SOA paradigm to increase both efficiency and flexibility.

Vanderhaeghen, Fettke, and Loos show how Web 2.0 technology may support BPM. They pay particular attention to the concepts of “collective intelligence” and “self-organization” as specific features of Web 2.0 that may contribute to both organizational and technological aspects of BPM.

In the interview, Rudi Studer, one of the pioneers in the field, elucidates major research results and their transfer into practical use. He also gives an inspiring outlook to future research.

This special focus is meant to provide a good overview of the emerging field of research in the intersection of BPM, Semantic Web, and Web 2.0. We are grateful to the reviewers for their support. We hope you will enjoy reading this issue.

The issue is complemented by a paper outside of the special focus. Braunwarth, Kaiser, and Müller analyze to what degree business processes within insurance companies should be automated with respect to the optimal present value of future cash flows.

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