A Context-Based Approach for Supporting Knowledge Work with Semantic Portals

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ABSTRACT

Portals are an enabling technology for knowledge management (KM): They provide users with a consolidated interface that allows accessing various types of structured and unstructured information. From the view of KM, their success depends not only on the ability to provide information and knowledge depending on the user's tasks in business processes (exploitation of knowledge) but also on the ability to support unstructured, creative and learning-oriented actions of knowledge work (exploration of knowledge). However, knowledge management lacks concepts for integrated support of these orientations of knowledge work. The concept of knowledge stance is seen as a promising starting point. This paper presents the INWISS portal prototype that employs Semantic Web technologies for context-based integration of various information sources and applications on a semantic level and discusses extensions to this portal for the support of knowledge stances.

Keywords: context; knowledge stance; knowledge work; portals

INTRODUCTION

Knowledge work can be characterized by a high degree of variety and exceptions, strong communication needs, weakly structured processes, participation in networks and communities, and as requiring a high level of skill and expertise (Schultze 2003, Maier 2004). Process-oriented knowledge management (KM) suggests focusing on enhancing efficiency of knowledge work in the context of business processes and, in this way, linking KM efforts to the value chains of organizations (Edwards & Kidd, 2003; Maier & Remus, 2003). Various types of information and communication technologies (ICT) are deployed to support knowledge work, ideally forming an enterprise-wide knowledge infrastructure (EKI) (Maier, Hädrich & Peinl, 2005). Portals are an important part of the EKI, since they provide users with a con-
solidated, personalized interface that allows access to various types of structured and unstructured information as well as applications simultaneously.

Models are a foundation to design, supporting ICT in general and semantic portals in particular. However, process-oriented KM lacks ways to model knowledge work in the context of business processes, especially the knowledge-oriented actions connected to the tasks accomplished in business processes. Here, the concept of knowledge stance can be seen as a promising starting point (Hädrich & Maier, 2004). The goals of this paper are to (1) discuss how knowledge stances can be applied and detailed to model knowledge work and to support it with semantic portals, (2) present results from implementing a portal prototype that deploys Semantic Web technologies to integrate various information sources on a semantic level (Priebe, 2004; Priebe & Pernul, 2003), and (3) discuss extensions to this portal to support knowledge stances.

The remainder of this paper is organized as follows: The concept of knowledge stance is outlined in the second section together with its conceptual foundations. The third section provides a framework for context information and relates knowledge stances to it. The fourth section presents the INWISS knowledge portal prototype and how it applies Semantic Web technologies to provide a context-based portlet integration. The fifth section proposes extensions to the portal based on knowledge stances and discusses how these can be implemented. The last section concludes the paper by giving an outlook on future research.

**MODELING KNOWLEDGE WORK**

Modeling approaches applied in KM can be classified into four categories, according to the concepts that they primarily emphasize: (1) person (e.g., communication relationships and structural organization); (2) process (e.g., business processes and tasks); (3) topic (e.g., knowledge structure defined by an ontology); and (4) tool (e.g., software architecture and interaction of components) (Maier, 2004). From the view of KM, the interconnections among concepts in these categories are of particular interest (e.g., Markus Schmidt [person] is experienced in project management [topic]). When choosing a process-oriented KM approach, the relationships among the categories process and topic are of primary interest (i.e., the link between functions and tasks accomplished in business processes and the knowledge applied and created in this context). This section describes two perspectives on knowledge work that correspond to these two categories: a process-oriented and an activity-oriented perspective. The concept of knowledge stance is one possible way to connect these perspectives.

**Process Modeling vs. Activity Modeling**

Examples of traditional process modeling approaches are ADONIS (Junginger, Kühn, Strobl & Karagiannis, 2000), ARIS (Scheer, 2001), IEM (Spur, Mertins & Jochem, 1996), MEMO (Frank, 2002), PROMET (Österle, 1995), SOM (Ferstl & Sinz, 1994), UML-based process modeling (Oestereich, Weiss, Schröder, Weiklens & Lenhard, 2003), and IDEF. Examples for approaches that extend process modeling...
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