Chapter VI

Building Integrative Enterprise Knowledge Portals with Semantic Web Technologies

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Editors’ Notes

Torsten displays profound expertise in the fields of knowledge management and Semantic Web. His capacity on applied technologies and his clear-cut thoughts has resulted in an excellent chapter. For many people, the theme of enterprise knowledge portals is the key for realizing the potential benefits of Semantic Web technologies for businesses.

A comprehensive discussion of content management, global searching and the integration of external content and applications give readers the opportunity to understand the whole “forest” of developing and supporting integrative enterprise knowledge portals. With this chapter, the discussion of the previous chapters is maturing.

We encourage readers to further explore the Internet session provided by Torsten, which is about a prototype system, called INWISS, that demonstrates in practice how SW technologies can boost the management of enterprise knowledge resources.
Abstract

The goal of this chapter is to show how Semantic Web technologies can help build integrative enterprise knowledge portals. Three main areas are identified: content management and metadata, global searching, and the integration of external content and applications. For these three areas the state-of-the-art as well as current research results are discussed. In particular, a metadata-based information retrieval and a context-based portlet integration approach are presented. These have been implemented in a research prototype which is introduced in the Internet session at the end of the chapter.

Introduction

A major challenge of today’s information systems is to provide the user with the right information at the right time and in the right quality. Using Web-based technologies, enterprise knowledge portals are an emerging approach for providing a single point of access to various types of information and applications. Today’s portal systems allow combining different portal components side by side on a single portal Web page. However, there is only little interaction between those so-called portlets. When a user navigates within one portlet, the others remain unchanged, which means that each source has to be searched individually for relevant information (Priebe & Pernul, 2003).

In 1998, Berners-Lee introduced his roadmap toward the Semantic Web (Berners-Lee, 1998). His vision was that the existing World Wide Web should be enriched by metadata that would enable computers to understand the information given in Web resources. If a machine was able to really understand the meaning, content, and context of a document it would be able to work with that data, retrieve additional information, put it in a wider context, and communicate about that document with other machines. Meanwhile, the resource description framework (RDF) and the Web ontology language (OWL) have evolved as standards from the Semantic Web Initiative of the Word Wide Web Consortium (2004a, 2004b, 2004c).

The goal of this chapter is to analyze how such Semantic Web technologies can help build integrative enterprise knowledge portals. Three main areas are identified: content management and metadata, global searching, and the integration of external content and applications. For these three areas the state-of-the-art as well as current research results are discussed.

In particular, we present an approach for communicating the user context (revealing the user’s information need) among portlets. For example, the query context of a reporting portlet, that is, the information shown within a certain OLAP report (Chaudhuri & Dayal, 1997), can be used by a search portlet to automatically provide the user with related Intranet articles or documents. This provides for implicit, proactive information retrieval capabilities. In order to be able to perform context-based searches, we use metadata queries rather than full-text searches, due to semantics that can be used (e.g., by utilizing an ontology).