

Proactive Knowledge Delivery for Enterprise Knowledge Management

Andreas Abecker, Ansgar Bernardi, and Michael Sintek
German Research Center for Artificial Intelligence (DFKI GmbH)
Knowledge Management Group
Postfach 2080, D-67608 Kaiserslautern, Germany
e-mail: {aabecker|bernardi|sintek}@dfki.uni-kl.de
<http://www.dfki.uni-kl.de/frodo/knowmore.html>

Abstract. An overview of the recent trends in modern enterprises motivates the central requirements for knowledge management and its support by information technology. We illustrate proactive knowledge delivery and context-sensitive information retrieval by presenting the KnowMore system. This prototype realizes active support by providing relevant information to current tasks in enterprises which are managed by a workflow system. We identify the key concepts which need to be represented in order to deal with the existing heterogeneity. We sketch the architecture of the system and highlight some implementation details.

1 Motivation: Enterprise Knowledge Management

The role of knowledge as an important, maybe the most important productive factor of modern enterprises is increasingly recognized. In today's highly dynamic environments the effective use of all available knowledge in an enterprise - be it documented, formally coded, or available in the heads of the employees - is indispensable for success. Knowledge Management (KM) tries to tackle this problem and develops tools and methods to support the acquisition, conservation, and effective use of knowledge in an enterprise. To this end, combinations of management sciences and information technology are investigated and developed towards support by business information systems and enterprise information infrastructures (see, e.g., [8] or [9]). In this endeavour, several difficulties keep reappearing: Expensive decisions in an enterprise are made without considering available knowledge. Experiences, especially costly ones, are made multiple times by independent people. Available information is contained in heterogeneous information sources, ranging from people over unstructured or semi-structured documents to databases and coded business rules. The heterogeneity of these sources makes timely access difficult, even if employees are aware of the existence of relevant information and knowledge - but typically they are not!

To tackle these difficulties, a promising approach is the integration of the various information sources which exist in an enterprise into a comprehensive enterprise information infrastructure. Together with the appropriate access services, this information infrastructure is often called Corporate Memory, Organizational Memory

Information System (OMIS), or shortly Organizational Memory (OM). Concluding the analysis of some industrial case studies, [Z] argue that an Organizational Memory should exhibit several distinguishing properties, among them:

1. **INTEGRATIVE FUNCTIONS:** all real applications are characterized by a highly interwoven handling of data, formal knowledge (workflow steps, formal decision rules, mathematical formulae, etc.), informal representations (texts, memos, minutes of meetings, documentation, business letters, graphics and drawings) and knowledge embedded (“materialized”) in artifacts/representations of work (e.g., a product design). Not only the conjoint view and usage of all these representations is important, but still more, the various interrelationships among them (a decision is grounded on a dossier which employs some formal calculations, it is negotiated in a meeting and documented in the minutes, and it leads to other decisions and effects on the final result of work). Furthermore, already at the technical level, there is a huge amount of heterogeneity since we have to build upon many legacy knowledge and information systems.
2. **ACTIVE SUPPORT:** In the rapidly changing business information world, users are often not aware that there is useful information in the system available. Even if they are, they do not necessarily know where and how to search for it (in an optimal way). Even if they know, searching costs time and effort. Thus, the OM should actively offer interesting knowledge.

An approach to the first issue is faced with the heterogeneity of more or less informal knowledge representations which are in use in real knowledge-work processes. Consequently it is necessary to design an OM system as, so to speak, a meta information system, which on the basis of a knowledge-rich retrieval component provides access to existing legacy knowledge and information systems.

A solution to the second issue lies in the close integration of an OM with the business processes of the enterprise and their IT enactment in workflow systems. As each task in an enterprise is part of some - probably explicitly known or even formalized - business process which in turn can be operationalized in workflow systems, the workflow engine can be employed to trigger active information support. The context of the process, on the other hand, can be used both for determining relevant information as well as for precise indexing when new information is entered into the OM.

Figure 1 illustrates these concepts: The OM comprises a variety of heterogeneous information sources. From this, decision support is offered automatically to specific tasks in various business processes. New information is captured and stored in the OM, taking into account the context of the business process where it was created.

In this paper we focus on the active support by workflow-embedded, precise-content information retrieval from various, heterogeneous sources. The embedding into the business workflows facilitates the active support, while the necessary integration issues are tackled by uniform meta descriptions of the various knowledge sources based on logic-based modeling and three relevant ontologies.