Sharing Organizational Knowledge through Knowledge Repositories

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INTRODUCTION

Knowledge repositories are increasingly being viewed as a special form of knowledge management in organizational memory information systems (OMISs). Presented in this paper are the design concepts and guidelines for building a knowledge repository, and its practical implementation in the form of a prototype. The needs and the organizational and technical challenges associated with the undertaking of such a project are identified, and recommendations and strategies for overcoming the restrictions are discussed. In light of these repository-building guiding principles, the prototype of such a knowledge management system is envisaged to be a Web-based electronic repository of online pedagogical resources, built to help foster a learning organization that works together to gather and share knowledge. As per the design guidelines, information resources within this prototype are combined with user insights and experience in the form of associated annotations and then categorized within a subject tree to appear as knowledge to the repository users.

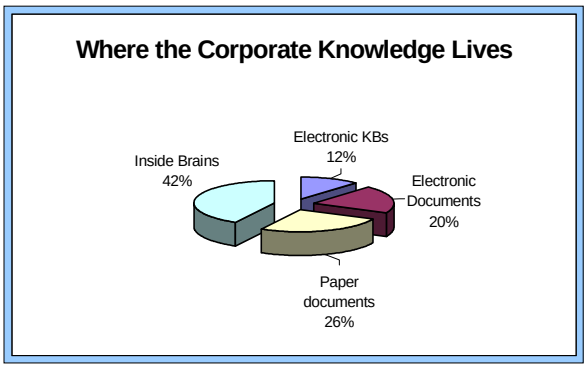
BACKGROUND

"Only 2 percent of information gets written down, the rest is in people's mind," says David Owens, vice president of knowledge management at Unisys Corporation and vice chair of the Conference Board's Learning and Knowledge Management Council (Hickins, 1999). This comment clearly illustrates that knowledge management (KM) places equal emphasis on capturing the tacit knowledge that is in people's heads, rather than targeting just the explicit knowledge that can be stored in a more shareable format. By managing its knowledge an organization would know more, and the more it knows, the more successful it will be. And this comes only after an understanding of the kind of information that is available to the members of an organization, where it is and how it can be accessed (Hackbarth & Grover, 1999).

While the figure quoted by David Owens is probably derived from personal experiences, a study of the empirical division of knowledge in an organization was carried out by the Delphi Group when they looked at KM practices in approximately 700 U.S. companies (Hickins, 1999). The results, presented in Figure 1, illustrate the fact that only a portion of the corporate knowledge is in shareable format while the majority (42%) of any one kind of knowledge resides inside people's heads. However, people leave organizations, taking away the knowledge that is stored in their heads. Therefore, organizations must build knowledge management (KM) systems, such as knowledge repositories, to retain the maximum possible tacit knowledge and make it available to the people who need it. This simple need for KM systems is supported by results from another survey, again by Delphi group, of 370 business professionals which showed that 28% had already begun or completed KM projects, while 93% said that they would undertake such projects by 2000 (Anthes, 1998).

Data and information need to be integrated to arrive at knowledge, and what is data to some may be information for others. Knowledge is, however, information that has been edited and analyzed in such a manner to make it useful. It has the greatest human contribution, stems from people, is the most difficult to manage, and is mostly context-specific (Grover & Davenport, 2001). And when knowledge from the past is brought to bear on present activities and thus affects the level of organizational effectiveness, then it is called organizational memory, or OM (Stein, 1992). A knowledge management system should then manage and expand this organizational memory while retaining a strong organizational learning founda-

Figure 1. Breakdown of knowledge areas within an organization



tion so as to successfully increase an organization's potential for taking effective action (Alavi, 2000; Davenport & Prusak, 1998). Such a knowledge management system would act as an organizational memory information system (OMIS), which provides a coherent integration of dispersed know-how, or OM, from all over the organization (Stein). An important aspect of OMIS is that the projects requiring its use do not involve a simple development of the system but require the incorporation of a concept of organizational development with a focus on enterprise-wide knowledge sharing and learning (Lehner, Mair, & Klosa, 1998). Thus, while an advanced database system will view information as a resource, an OMIS will focus on managing knowledge and contribute to learning ability, flexibility, and mastering of organizational change.

Development of an OMIS is not technology-driven but people-driven (Hickins, 1999), and these systems can firmly be placed as organizational knowledge management systems as they adapt to the social dynamics of the workplace. These social dynamics may include factors such as work habits, perceived benefits, and knowledge sharing. A knowledge repository can then be classified as a special form of OMIS because it embodies the phases of acquisition, retention, maintenance, and retrieval within its knowledge management framework (Hackbarth & Grover, 1999; Maier & Klosa, 1999). Processing of knowledge can be added to this list, and this may involve sorting, filtering, organizing, analyzing, comparing, correlating, mining, or a simple labelling of knowledge so that others can find it (Seng, Zannes, & Pace, 2002). These processes are necessary so that the objective of a knowledge repository can be achieved, which is to capture knowledge for later access by organizational members, and common repository techniques using these concepts include Lotus Notes, Web-based intranets, and document management tools (Grover & Davenport, 2001).

FISKR AS A KNOWLEDGE REPOSITORY

Sharing of tacit knowledge is aimed at gathering knowledge locked in people's heads, their notebooks, or desktops or simply lying in the filing drawer, things that were envisaged to be achieved by this repository. Thus, this was the rationale behind the design of the Faculty of Information Studies Knowledge Repository (FISKR) at FIS in University of Toronto. This repository is capable of acquiring and retaining "structured information," such as resources or pointers to resources of many different kinds, including, but not limited to, electronic or printed material, slide presentations, multimedia files, student papers, theses, reviews, or any other resources that are relevant to the subject matter. Retained in addition to structured information was "informal knowledge," which took the form of user-contributed annotations associated with each resource and provided added value in terms of conveying knowledge. Support was also made available to the faculty members for the creation of course pages and reading lists.

What differentiated FISKR from any other database was the fact that tacit information, which is ordinarily not shared and is deemed useful for the learning community, was made available in a shareable format to its members. Thus, the "implicit" data and information added to this repository consist of not just the resources but the associated contributor's experience, insight, and use context, which was made available to the members of a community in an "explicit" and organized form, or was now knowledge for its users. Such a design was also demonstrated in the conceptual design of a learning organization's KM system (Hall, Paradice, & Courtney, 2003). Nonaka and Takeuchi (1995) addressed this key issue of organizational knowledge creation and labeled it as "knowledge conversion," where human knowledge is created and expanded through social interaction between tacit knowledge and explicit knowledge.

The actual design of repository-based KM projects can be classified in two ways. The top-down approach looks at the knowledge present within a department and seeks to bring that together within a KM system by utilizing the services of a group of specialized personnel. Bottom-up approach on the other hand would tend to identify user needs and create a repository first and then encourage the users to add their knowledge to it. The latter category was chosen for implementing FISKR as it suited an educational environment.

A notable example of building a bottom-up knowledge repository as an OMIS was the Eureka project at Xerox (Hickins, 1999). It was noted at that time that the database housed more than 5,000 user "contributions," which were available to the Xerox employees via the World Wide Web right on their laptops. Docushare was another such Xerox project. Similarly, Hewlett-Packard used Lotus Notes to capture tips. Reviewing FISKR's design in context of the knowledge sharing at these companies, it was noted that success came out of the overall cooperative culture developed there as the management believed that technology must support the distributed sharing of knowledge because the work had become very cooperative in nature. This was in line with recommendations put forward by Davenport, DeLong, and Beers (1998), who suggested that a key success factor for knowledge management project was that knowledge repository creation should be accompanied by encouraging and facilitating communication among organizational members, thereby improving knowledge access and enhancing the knowledge envi-