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An Approach to Knowledge Management: The Contribution
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Abstract

This paper attempts to identify models of knowledge acquisition and dissemination that are appropriate for the 21st century organizations facing complex and rapidly changing business environments. The specific aims of this paper are to (1) propose a new socio-technical model for Knowledge Management, (2) discuss some mature as well as emerging technologies that are now widely used for Knowledge Management, and (3) present few emerging learning systems and environments, and introduce how shadowy groups called "Communities of Practice" and "Share Groups" are transforming the acquisition, creation, packaging, and application of knowledge.

Introduction

With the demand-driven "customer value network" paradigm of economic activity replacing the old "bricks and mortar" industrial supply chain model, it is becoming increasingly clear to the corporate managers that knowledge is the primary source of sustainable competitive strength. Methods for harnessing corporate knowledge are converging in a practice called knowledge management (KM). Gordon Petrash, a global director at Dow Chemical Co., defines KM as "getting the right knowledge to the right people at the right time so they can make the best decision" [Hibbard, 1997]. According to another author, "Knowledge Management caters to the critical issues of organizational adaptation, survival and competence in face of increasingly discontinuous environmental change. Essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings" [Malhotra, 1997]. According to Nonaka, "knowledge is created between the interaction of explicit and tacit knowledge." From these definitions, it is clear that the success of a knowledge-based organization will require hybrid solutions of people and technology. Therefore, in this paper, we propose such a hybrid model for effective management of knowledge (Figure 1).

Component Technologies

A host of information technologies have arisen to support KM; intranets, data warehousing, decision-support tools, groupware are just a few. The results of a recent survey conducted by Delphi Consulting on the utilization of KM technologies are summarized in Table 1.

What was once the exclusive domain of the information scientist or the librarian is no longer so. The concepts of selective dissemination of information (SDI) have been transformed with new technologies, particularly those based upon internetworking. For the purposes of this analysis we may divide these technologies into those that provide general information to large communities and those that connect smaller communities.

In the first category of technologies, those that provide general information to large communities, the most obvious current example is the availability of the exponentially growing World Wide Web. Ever more powerful search engines provide access to this pool of information which, with other tools to transform the information into knowledge. But how does the knowledge worker access this pool? Normally, this is done on a demand basis through the search engines. As the knowledge worker's time becomes more valuable tools such as push technologies and intelligent agents become more inviting.   As in the old SDI processes, profiles of interest, often dynamically developed, are used by these technologies to seek out and present to the user the most relevant information for their needs. Other technologies such as data mining and visualization provide additional knowledge creation avenues. Once the individual knowledge worker has identified relevant knowledge, the second category of technologies comes into play. One example of a Web browser being used as a framework for a knowledge system is the library function within Hewlett-Packard (HP) Laboratories. The goal is to provide a guide to human knowledge resources within

the organization. This system, called Connex, uses a Web browser as an interface to a relational database. The primary content is a set of expert profiles, or guides to the backgrounds of individuals who possess knowledge in a particular area. By browsing Connex, it will be easy to find someone who is an expert in a specific field of knowledge (Davenport, 1997).

In the second category we find the technologies for the sharing of knowledge. For example, messaging (voice mail, electronic mail, bulletin board systems, facsimile, desktop videoconferencing, etc.) and groupware (Lotus Notes, Microsoft Exchange, etc.) provide direct links between individuals and cohort groups. Internet newsgroups create "invisible colleges" of knowledge workers who can pose, question, advocate, analyze and debate without the need for physical or temporal proximity. Worldwide communities of scholars or geographically dispersed divisions of a "virtual corporation" can now tackle problems in time frames only dreamed about in earlier generations.

Component Social Issues

Technology plays a very vital role in KM, but technology on its own cannot make KM happen. Organizations are beginning to realize that knowledge and intellectual assets must be managed deliberately, systematically, and with expertise to survive [Sveiby, 1987]. Several professional services firms (McKinsey, Anderson Consulting, Ernst and Young, Price Waterhouse, and A.T. Kearney) already have already created ranks of "Chief Knowledge Officers." Buckman Laboratories reoriented its Information Systems organization to become managers of knowledge, and now calls the group the knowledge transfer department [Davenport, 1997].

Some challenges facing these "Chief Knowledge Officers" are, (1) understanding how people learn and share their knowledge and expertise with their colleagues? (2) what processes to put in place which make it easy for them to learn and share new knowledge? (3) what rewards and incentives should be provided for contributing to organizational knowledge base? And (4) how to transform individual learning into organizational learning?

Management literature [Reading, 1995] shows that the executive training is still one of the most widely used method for individual skill development, organizational revitalization, or knowledge transfer. However, since most training focuses on the transfer of information from expert(s) source to a training participant, the absence of action or experience from this process makes it more like learning to acquire information. According to Cavaleri et al. (1994), "the *learning to do* that is often associated with the development of *know how* usually comes when new information is combined with action, experimentation and experience."

Several new organizational forms and metaphors are emerging to inculcate action, experimentation and experience in the learning and knowledge deployment process. *Knowledge Factory*, *Communities of Practice* and *Share Groups* are examples of such metaphors and organizational forms. Knowledge Factory is a metaphor to describe an accelerated learning organization driven by dynamic processes that create superior knowledge and translate that knowledge into competitive capabilities and core competencies (Roth et al., 1994). Community of Practice are the shop floor of human capital, the place where the organizational learning takes place. The concept of Community of Practice has been pioneered by the Institute for Research on Learning (IRL), a spin-off of the Xerox Corporation in Palo Alto, CA. Brook Manville, director of knowledge management at McKinsey & Co., defines a Community of Practice as, "a group of people who are informally bound to one another by exposure to a common class of problem." (Stewart, 1996). These groups emerge of their own accord, are responsible only to themselves, they have an agenda, a deadline, accountability, and a membership list. A Community of Practice is voluntary and generally has no specific "deliverable" like a report (Stewart, 1996). According to IRL, some of the characteristics of a Community of Practice are (IRL, 1997), (1) learning is fundamentally a social phenomenon, (2) knowledge is integrated in the life of communities that share values, beliefs, languages, and ways of doing things, (3) the process of learning and the process of membership in a community of Practice are inseparable, (4) knowledge is inseparable from practice, and (5) the ability to contribute to a community creates the potential for learning. Most communities of practice draw their members from within a single company, for example, companies such as Intel, Dow Chemical, and National Semiconductor support Communities of Practice (Stewart, 1996). A Share Group is a multi-organizational Community of Practice that exists on the premise that as a result of various industrial environments and their operating constraints, diverse market conditions, and numerous management philosophies, no single organization can ever control or dominate all effective operating practices, good ideas, and solutions [Gupta, 1997]. A Share Group blends the concept of a Community of Practice with the notion of benchmarking. Therefore, the diversity of participants in a Share Group provides each organization with a dynamic and effective intellectual capital management mechanism to fill the gap between its current and needed intellectual capital.

Summary

Although there is no common consensus on the concept of KM, the shared theme is that increasingly, knowledge in the minds of members is a valuable organizational resource (Malhotra, 1997). It must be treated as such. This is why it is important, when designing a KM system for an organization, that elements, relationships, behaviours, and applications of organizational

resources be defined and understood (Barcley, 1996). Technology promises great power and flexibility, but can organizational structures, both locally within the firm and globally among the enterprises match this promise with commitment and effectiveness? The challenge of the 21st Century may be to transform the Information Age to the Knowledge Age by combining both technologies and the social issues, as presented in the model in this article.

References

Available upon request from the first author.

Table 1. Summary of Delphi Consulting Survey of KM Technology Utilization
(Source: Hibbard, 1997)

	KM Technologies		
	Intranets	Data Warehousing	Decision-support Tools
% of Companies Implementing	50%	33%	33%
% of Companies with Plans to Implement	25%	25%	20%

Figure 1. A Socio-technical Model for Knowledge Management