

Integration of Knowledge Management and E-Learning

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INTRODUCTION

Knowledge management (KM) and e-learning are two concepts that address the requirements of lifelong learning. Over the past several years, there has been an increasing focus on the integration of knowledge management and e-learning systems. By 2003, 70% of organizations implementing knowledge management were linking it with e-learning technically and organizationally (Gartner, 2000). The integration of knowledge management and e-learning enables the creation of great synergies in organizations and business applications. In this article, these two concepts will be presented and their integration will be discussed in detail.

BACKGROUND

E-learning has its historical roots in more than 30 years of development of computer-supported education. The past decade, in particular, has witnessed a dramatic increase in the development of technology-based teaching and learning (Alavi & Leidner, 2001a). E-learning is an instructional process that gives online learners access to a wide range of resources—instructors, learners, and content such as readings and exercises—independently of place and time (Zhang & Nunamaker, 2003). It represents the conscious learning process where objectives and domains are clearly defined, and the focus is set to individual online learner perspectives and demands. Effective and efficient e-learning methods are generally required to ensure that online learners are equipped with the latest knowledge in a timely manner. The previous research has proposed a framework in which e-learning effectiveness is affected by two major components: the human dimension and the design dimension in virtual learning environments (Piccoli, Ahmad, & Ives, 2001). The technology in this framework is geared toward providing effective e-learning. For example, content management is one of the factors in the design dimension, which includes factual knowledge, procedural knowledge, and conceptual knowledge, that has a positive relationship

with e-learning effectiveness. The design of interaction enhances the knowledge sharing among learners, and between learners and the instructor.

In contrast to traditional classroom learning, e-learning has several advantages for learners, such as time and location flexibility, relatively cost and time savings, learner-controlled instruction, unlimited access to electronic learning materials, and flexible collaboration between instructors and learners. The previous research has shown that learners benefit from using a variety of e-learning systems. Many e-learning systems present instructional material in a static, passive, and unstructured manner, and give learners little control over the learning content and process. The adaptive e-learning systems integrate knowledge management activities into their e-learning architectures and provide online learners with tailored instruction.

Individuals and groups learn by understanding and then acting, or by acting and then interpreting (Crossan et al., 1999). The process of change in individual and shared thought and action, which is affected by and embedded in the institutions of the organization, is called organization learning (Vera & Crossan, 2003, pp. 122-141). When individual and group learning becomes institutionalized, organizational learning occurs, and knowledge is embedded and created in non-human repositories such as routines, systems, structures, culture, and strategy (Hardaker & Smith, 2002; Crossan et al., 1999).

Knowledge management (KM), on the other hand, has been developed within the business context. The recent interest in organizational knowledge has prompted the use of knowledge management in order to process and manage the knowledge to the organization's benefit (Alavi & Leidner, 2001b). Knowledge management outcomes fall into three main categories: knowledge creation, retention, and transfer (Argote et al., 2003). Knowledge creation occurs when new knowledge is generated in an organization. Knowledge retention involves embedding knowledge in a repository so that it exhibits some persistence over time. Knowledge transfer is evident when experience acquired in one unit affects another. These three categories are closely related.

Table 1. Knowledge management processes and the potential roles of IT (Alavi & Leidner, 2001b)

Knowledge Management Process	Knowledge Creation	Knowledge Storage/Retrieval	Knowledge Transfer	Knowledge Application
Supporting Information Technologies	Data mining Learning tools	Electronic bulletin boards Knowledge repositories Database	Electronic bulletin boards Discussion forums Knowledge directories	Expert systems Workflow management
IT Enablers	Combining new sources of knowledge Just-in-time learning	Support of individual and organizational memory inter-group knowledge access	More extensive internal network More communication channels available Faster access to knowledge sources	Knowledge can be applied in many locations More rapid application of new knowledge through workflow automation
Platform Technology	Groupware and communication technologies			
	INTRANETS			

Lee and Choi (2003) proposed a research framework for studying knowledge management such that the synergy of information technologies, as one of the knowledge management enablers, is positively related to the knowledge management process. Information technology affects knowledge creation in a variety of ways, such as in knowledge sharing, storage, and knowledge flow. Therefore, knowledge management systems are used to rapidly capture, share, organize, and deliver large amounts of corporate knowledge. Knowledge management systems refer to a class of information systems applied to management of organizational knowledge. They are developed to support knowledge management processes in terms of knowledge creation, storage/retrieval, transfer, and application (Alavi & Leidner, 2001b).

Knowledge management processes, also called knowledge management *activities*—form a structured, coordinated system for managing knowledge effectively (Becerra-Fernandez & Sabherwal, 2001). Table 1 illustrates knowledge management processes and the potential roles of information technology (IT). For instance, *knowledge creation* can be achieved through learning tools, such as e-learning systems. Knowledge can be *stored/retrieved* in/from e-learning system repositories and electronic bulletin boards. Discussion forums and electronic bulletin boards provide *knowledge transfer* between learners, and course management and content management can be viewed as *knowledge application* in e-learning environments. Schwartz et al. (2000) stated that knowledge acquisition, distribution, and storage are highly correlated and can fruitfully influence each other. Knowledge acquisition deals with the issues that surround knowledge extraction in its various forms; knowledge distribution tackles the problem of getting the right

knowledge to the right place at the right time (Schwartz & Te'eni, 2000), and knowledge storage undertakes the knowledge repository. Knowledge management is a learning process than requires a continuous re-evaluation of the way knowledge is acquired, organized, and delivered (van der Spek & Spijkervet, 1997).

KNOWLEDGE MANAGEMENT ENABLERS AND KNOWLEDGE MANAGEMENT PROCESSES IN E-LEARNING

The integration of knowledge management and e-learning is an elaboration of knowledge management systems and e-learning systems. Knowledge management could be a cornerstone of e-learning. Effective e-learning leverages traditional e-learning technology such as computing, communication, and multimedia technologies, and knowledge management to create learning environments that can be richer and more flexible, scalable, and cost effective than the standard classroom or lecture hall (Piccoli et al., 2001; Becerra-Fernandez & Sabherwal, 2001). Therefore, e-learning systems integrating with knowledge management are designed to support the rapid capture, delivery, and measurement of knowledge in a Web-based fashion. They are designed to consider online learners' attributes and instructional strategies to provide adaptive, learner control and collaborative e-learning environments, and to thereby maximize e-learning effectiveness.

Recent knowledge management developments enable the education community to provide high-quality multimedia content via the Internet, keep track of online learner activities, or support long-distance communication and

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