The effects of integrating knowledge management with E-Learning systems

Thair Khdour
Computer Information Systems Department
Albalqa Applied University
Salt 19117 Jordan
khdour@bau.edu.jo

Shaima Salem
Amman College for Financial and Managerial Science
Albalqa Applied University
Amman Jordan
shaima_mis@yahoo.com

Abstract—since the 21st century, the rapid growth and advances of information and communication technologies bring huge changes in function, contents, and communications and the way we seek information and knowledge. Knowledge becomes the most important factor in the long-term success for both an individual and an organization. A lot of firms are just beginning to understand that knowledge is the currency of the new economy. The ability to learn and to manage learning becomes critical to the success of organizations. So, effective management of knowledge is getting widely concerned and Knowledge management technology is now used to rapidly capture, organize and deliver large amounts of corporate knowledge. Many firms adopt knowledge management initiatives to facilitate the sharing and integration of knowledge, like integrating knowledge management with E-learning. This paper investigates How to integrate between knowledge management and e-learning to improve capturing and sharing knowledge in the form of a general view.

Keywords—Knowledge management, e-learning, organizational learning.

I. INTRODUCTION

“By 2003, 70 percent of enterprises implementing knowledge management will link it with e-learning technically and organizationally.” This is the word from the Gartner Group, a leading research and consulting firm [Aldrich, 2000]. We’re beyond the industrial age, slipping off the edge of the information age into the knowledge age and seeing the convergence of knowledge management and learning.

The International Data Corporation predicts that the worldwide market for KM software will expand from $1.4 billion in 1999 to $5.4 billion in 2004. The marketplace for vendors providing e-learning software and content is unpredictable at present. Being an asset and is now looked upon as intellectual capital, Knowledge is an internal product. Making sure it’s shared and made available in the enterprise makes good business and it would be a competitive advantage.

Through collaborative work processes in communities of employees who willingly share information in order to smooth out their work problems, the collection of knowledge occurs. One important consideration is that access to the corporate knowledge-base is made absolutely easy-to-reach. The technology for information retrieval must be engaged to enable employees to effortlessly retrieve all the information they need, when they need it. Information retrieval and dissemination must be a seamless process [Rhoads, 2012]. The search for competitive advantage in a global environment must consider the use of tacit and explicit knowledge circulating inside companies. Enterprise learners facing the changing demands of the workplace are driven to learning from the work experience of peers, colleagues, and situated experts. However, in the digital age, knowledge required for the workplace may be effectively acquired through just-in-time and shared learning. According to [Cross, 2006], more than eighty percent of workplace learning is now done outside the formal learning environment of sponsored classes and training. In other words, most learning now takes place outside the traditional face-to-face environment. The challenges to learning in knowledge societies are not limited to how effectively helping learners to acquire knowledge and skills, but in helping them to learn how to manage, work creatively with ideas and to contribute to the creation of new knowledge[Wang & Yang, 2009]. Another challenge is to develop a model that represents management at the individual, group, division, and enterprise levels and that describes the integrating infrastructure needed to provide a unified resource base to the end user in searching of information.

II. LITERATURE REVIEW

Recent research reveals great interest to introduce Knowledge Management system (KMS) ideas to e-learning [Ravet, 2002]. The joint studies of E-learning systems and KMS point out the same fundamental goal: facilitating organizational learning. Researchers try to analyze the similarity of the goals, methods of assessment, and some knowledge sharing processes both in E-learning systems and KM. An E-learning system within KM is traditionally analyzed as a knowledge resource repository, where the KM methods can be implemented to increase the effectiveness of knowledge dissemination [Sammour, et.al 2004]. [Wang and...
III. KNOWLEDGE AND KNOWLEDGE MANAGEMENT

In the last years Knowledge Management (KM) has caught the attention of both industrialists and researchers. Knowledge is what is known, it is used to mean the confident understanding of a subject, potentially with the ability to use it for a specific purpose [Tiwana, 2000]. The concept of KM is encompassing any processes and practices concerned with the creation, acquisition, capture, sharing and use of knowledge, skills and expertise. KM is the discipline that helps spread knowledge of individuals or groups across organizations in ways that directly affect performance. KM getting the right information within the right context, person, and time for the right business purposes. Otherwise spreading knowledge of individual or groups is basically the KM activity that involves generation, codifications and transfer.

A. Knowledge Management Processes:
The following are the KM processes which work in a cyclical manner and usually take place in a typical KM model in the context of learning [Sammour, 2008]:

1) Knowledge creation and acquisition – Knowledge creation and acquisition depend on nurturing people with knowledge – either individually or in teams or in communities of practice – and how knowledge is or can be acquired. The focus is on passive or unconscious knowledge acquisition.

2) Knowledge sharing – This takes place when people are genuinely interested in helping one another develop new capacities for action; it is about creating learning processes.

3) Knowledge capture – Knowledge has to be selected, chosen and archived. Here the challenge is capturing tacit knowledge as well as explicit knowledge. It is important to establish processes in order to formalize

4) Knowledge preservation. This knowledge has to be captured and stored in databases.

5) Knowledge application: the knowledge created and captured would then need to be applied to achieve competitive advantage.

6) Knowledge evaluation – It must be reviewed to verify that it is relevant and accurate.

B. E-learning & E-learning Systems:
E-learning involves the use of technology to enhance learning including collaboration, satellite broadcasting, CD-ROMS, audio and video conferencing, mobile technology, interactive TV and web-based technologies [Beninck, 2004]. E-learning has become the major concern of numerous companies and enterprises. E-learning systems has been evolving with the World Wide Web as a whole and changing to E-learning, a new term coined by Stephen Downes [Downes, 2005]. E-learning refers to using electronic applications and processes to learn. E-learning system applications and processes include Web-based learning, computer-based learning, virtual classrooms and digital collaboration [Qwaider, 2011].

E-Learning Systems is learning using electronic means: the acquisition of knowledge and skill using electronic technologies such as computer- and Internet-based courseware and local and wide area networks another definition of e-learning is as education via the Internet, network, or standalone computer. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM E-Learning, focuses on the individual's acquisition of new knowledge and the technological means to this construction process. Learning is the result of a combination of information elements and peoples interaction with organizational processes. It is the element which generates knowledge.
C. Benefits of E-Learning:
1. Cost effective: Since E-learning can be done in any geographic location and there are no travel expenses, this type of learning is much less costly than doing learning at a traditional institute.
2. Flexibility: is a major benefit of E-learning. Education is available when and where it is needed.
3. Personalized learning: is more focused on the learner and it is more interesting for the learner because it is information that they want to learn.
E-Learning is flexible and can be customized to meet the individual needs of the learners.

D. Organizational learning:
Dixon [Dixon, 1999], defines organizational learning as “the intentional use of learning processes at the individual, group and system level to continuously transform the organization in a direction that is increasingly satisfying to its stakeholders.” Dixon’s concept of organizational learning is best viewed as a collective activity, supporting the new collaborative viewpoint. E-learning now plays an important role for companies and enterprises by providing right knowledge to the right people at the right time. E-learning is emerging as a popular approach for learning in organizations or workplace settings.

IV. E-Learning and Knowledge Management
The concepts and methods of knowledge management (KM) can be employed in e-learning to improve the benefits of learning platform and E-learning effectiveness. As e-learning is a knowledge intensive process, the effectiveness of e-learning is highly dependent on the quality of its content knowledge, which in turn counts on the success of knowledge capture, storage, sharing and innovation. Therefore, the concepts and methods of knowledge management can be employed in e-learning to improve the benefits of learning platform and e-learning effectiveness [Hui, 2008]. Learning and knowledge management share a common strategy of creating a learning organization. Knowledge management is important to build an organization’s intellectual assets as well as improve individual, group, and organizational performance by knowledge sharing and dissemination. Learning in organizations serves for organizational goals and needs, and focuses on organizational systems, structures, policies, and institutional forms of knowledge to link individual and organizational learning [Wang and Stephen, 2009]. Finding effective ways to collaborate, and to create and share knowledge among people who are connected via disperse networks is one of the most challenging tasks. Knowledge management technologies provide significant opportunities to enhance e-learning applications by extending its reach to wider communities. Modern business operations are oriented towards improved information flows and enhanced skills in decision making [Du, 2010]. Integration of knowledge management and e-learning has become an unavoidable trend in supporting self-directed and just-in-time learning and the creation of shared organizational knowledge.

<table>
<thead>
<tr>
<th>E-learning</th>
<th>STRENGTH</th>
<th>WEAKNESS</th>
<th>BENEFITS OF UNIFICATION</th>
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<tbody>
<tr>
<td>• Considers how people learn and change.</td>
<td>• Can be rigid.</td>
<td>• Increased relevance, Ownership and dynamism.</td>
<td></td>
</tr>
<tr>
<td>• Structured and managed.</td>
<td>• Too focused on content.</td>
<td>• Less training required.</td>
<td></td>
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<tr>
<td>KM</td>
<td>• Current</td>
<td>• May ignore how people learn and change</td>
<td>• Increased learning effectiveness and direction.</td>
</tr>
<tr>
<td></td>
<td>• Dynamic</td>
<td>• May lose sight of</td>
<td>• Less searching and contributing required.</td>
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<td></td>
<td>• Participative</td>
<td>Organizational priorities.</td>
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Fig. 5: e-Learning & KM with Benefits of Unification [Inside Learning Technologies, 2009].

V. E-Learning System Enhancements to Knowledge Management
E-Learning system has been evolving separately from knowledge management. There have been recent investigations into the integration of these technologies [Allee, 2000]. E-Learning system will enhance the effectiveness of each of the five phases of KM as shown below. A sixth phase, Feedback, has also been added.

1) Socialization: Competency and skills measurements help identify the people with specific interests, skills and knowledge in the organization.
2) Externalization: Knowledge is captured by the system with the intent of teaching that knowledge to other people. This improves the knowledge capture process.
3) Combination: Knowledge about products and processes of the business is organized to make learning the knowledge more effective and efficient. Pedagogical techniques are embedded in the knowledge.
4) Internalization: Competency and skills measurements help identify which people lack the knowledge to do their job effectively and provide them with online training. E-Learning system will insure that a person has learned the knowledge using assessments and alternative learning methods, if necessary.
5) Cognition: People can be provided with on demand performance support by getting just the training that they need at the time that they need it to complete a business task.
6) Feedback: Assessments provide feedback concerning how well a person has learned and how well they have applied what they learned to a business problem.
Information technology most likely plays a dominant role in facilitating knowledge management emphasized that an effective information systems infrastructure is necessary for the organization to implement knowledge management process. A good infrastructure includes databases, computer networks and software. The integration of knowledge management and e-learning is performed by building a virtual learning community. A virtual community can build an interactive learning environment for people. This helps the integration of knowledge management and e-learning [Chieh & Cheng, 2004]. Knowledge management takes an organizational perspective on learning, and the problem lies in the lack of sharing knowledge among members of the organization. In such instances, e-learning or Internet-supported learning is the best way to help acquire the dynamic, distributed, shared and collaborative knowledge through the technological means to support this construction process [Hall & Graham, 2004]. E-learning permits participants to acquire knowledge, pass it from one person to another, apply it to problem-solving, and store that knowledge for future use. An efficient e-Learning system provides learners with a learning environment that has a high degree of freedom allowing learners to choose appropriate contents [Collins, 1999]. E-Learning and KM systems provide knowledge in different forms to the users. This content can be reused, annotated, modified or whatever else is needed for different approaches. Finding effective ways to collaborate, and to create and share knowledge among people who are connected via disperse networks is one of the most challenging tasks. Despite the ever-increasing practice of using e-learning in the workplace, most of the applications perform poorly in motivating employees to learn. Most workplace e-learning applications fail to meet the needs of learners and ultimately fail to serve the organization’s quest for success.

VI. The proposed framework:

1. Knowledge Holder: can either transfer tacit knowledge to a Knowledge Seeker through socialization or create explicit knowledge and store it in a knowledge repository.
2. Knowledge seeker: The Knowledge Seeker learns the explicit knowledge through an online guided learning experience. The Knowledge Seeker then uses the knowledge gained through socialization or internalization to make decisions and perform tasks in the enterprise. The performance of the Knowledge Seeker on these decisions and tasks is measured and returned to the knowledge repository as feedback that can be used to help determine if the skills have been learned and to suggest additional e-Learning experiences.
3. Tacit Knowledge: knowledge that resides in people's mind.
4. Socialization: Transfer tacit knowledge from one person to another person.
5. Externalization: Translate tacit knowledge into explicit knowledge in a repository.
6. Combination: Combine different bodies of explicit knowledge to create new explicit knowledge.
7. Internalization: Extract the explicit knowledge from a repository that is relevant to a particular person’s need and deliver it to that person where it is translated into tacit knowledge.
9. Feedback: Assessments provide feedback concerning how well a person has learned and how well they have applied what they learned to a business problem.
10. The Knowledge repository: A Knowledge Repository is a computerized system that systematically captures, organizes and categorizes an organization's knowledge. The repository can be searched and data can be quickly retrieved.

11. A learning content repository: is a store of digital content with an associated set of data management, search and access methods allowing application-independent access to the content.

12. Operational data: Information collected during the implementation of a management work processes (transactional data).

13. Knowledge sharing: knowledge sharing is determined by the following criteria.
   a. Articulation: The ability of the user to define what he needs.
   b. Awareness: Awareness of the knowledge available.
   d. Guidance: Knowledge managers are often considered key in the build-up of a knowledge sharing system. They must help define the areas of expertise of the members of the firm, guide their contributions, assist users, and be responsible for the language used in publications and other communication material. This is so as to avoid an information/knowledge overload.
   e. Completeness: Access to both centrally managed and self-published knowledge.

14. Collaboration tools:
   a. Instant Messaging: real time conversation to enhance collaboration in learning event or real time connects for general learning sharing.
   b. Discussion forums: focused topic based string of conversations which are storable and searchable. Co-creation of learning content.
   c. Web-conferencing: real time sharing of presentation and applications over the web and improves connect between experts and learners.
   d. Blogs: "author" and instantly publish information, ideas, suggestions, and other content. Knowledge creation and sharing.
   e. Wikis: multiple authors collaborate in the creation of a web site, including adding and modifying content co-author and share.
   f. Podcast & videos: online publishing of files and good means of distributing audio and video based-learning.
   g. Social networking: build networks; connect globally and along functional areas of interest.

15. The Instructional Designer: is a person (or software program) who organizes the learning of the knowledge by adding pre-assessments, additional learning aids, and post-assessments.

16. The Knowledge Organizer: is a person (or software program) that relates the created Knowledge to other knowledge in the repository or further refines the created knowledge.

17. The Micro Environment: Factors or elements in an organization's immediate area of operations that affect its performance and decision-making freedom. These factors include competitors, customers, distribution channels, suppliers, and the general public.

18. The Macro Environment: The major external and uncontrollable factors that influence an organization's decision making, and affect its performance and strategies. These factors include the economic factors; demographics; legal, political, and social conditions; technological changes; and natural forces.

VII. Conclusion:

Knowledge management and e-learning both address the same fundamental problem: facilitating learning in organizations.

Without the ready exchange of information, knowledge cannot be created, decisions cannot be made without knowledge, and innovations cannot be adopted. Ongoing learning is now a necessity for most employees and essential for those engaged in transitions across work and occupational boundaries. Our future work will look into long-term needs of workplace learning by integrating economic, social, and personal dimensions, and adopting human resource management and organizational learning perspectives. Further investigations will focus on developing and sustaining employees’ occupational competence to support individuals’ personal and professional advancement throughout their working life. Technology itself does not necessarily produce competitive advantages unless it aligns with organization's human and business resource properly. Learning and knowledge management theories complement in order to enhance people to be more flexible and quick adapting to the changes of the environment, allowing them to acquire rich and valuable experience and collaborate closely with other experts in order to enable greater transfer of “tacit” knowledge.

Future research efforts will be dedicated on exploration of how both fields – elearning and KM influence each other and how changes in one field can foster changes in the other one and how this process improve overall performance of the e-learning and KM processes.

Consequently, learners now highlight the need for a new environment that provides just-in-time support and allows learners to assume greater responsibility for independent learning and skill development.
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The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression, “One of us (R. B. G.) thanks . . .” Instead, try “R. B. G. thanks”. Put applicable sponsor acknowledgments here; DO NOT place them on the first page of your paper or as a footnote.

REFERENCES