



Fourth International Conference on Intelligent Computing & Information Systems

ICICIS 2009

19-22 March 2009

Faculty of Computer & Information Science (FCIS)
Ain Shams University

E- Proceeding



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Learning Management System and its Relationship with Knowledge Management

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ABSTRACT

The great evolution of the online world effects many domains, mainly education and knowledge management era. The new trend in educational institutes moves towards online learning, e-learning instead of traditional approach of face-to-face teaching. The main aspect of knowledge management is to offer various kind of information in different formats such as: reports, meeting to exchange opinions and experiences from the gathering database repository and related expert systems. e-learning is basically concern of delivering learning materials to its target users via e-learning platforms or in other words via the learning management systems (LMS). In this paper we discuss the similarities and differences between knowledge management and e-learning. In more specific, the relationship between our learning management system used at Arab Open University and knowledge management systems is presented. We explore the main factors of LMS by displaying how these aspects can be extracted from such LMS.

Keywords

e-learning, LMS, Knowledge management

1. INTRODUCTION

Knowledge management (KM) is "the name given to the set of systematic disciplined actions that an organization can take to obtain the greatest value from the knowledge available to it" [1]. In computer science, knowledge management means use knowledge by computer, this involve a lot of computer disciplines such as: data mining, question answering system, and natural web interfaces, etc. Knowledge management and technology is a critical issue in business, education, industry and wide areas.

Universities and educational institutes are one of the first organizations that use different technologies to manage its knowledge by making it shared, articulated and available for all parties in teaching process. In this context knowledge management is sometimes defined as "enabling organizational learning and it supports activities including knowledge acquisition, generation, sharing and use". [2]

The growth of using internet encourages educational researchers to move teaching approach towards e-learning, online learning, distance learning, and open learning in which students can deliver

their knowledge through the web any where and any time they want.

However, this is not restricted to only universities that adopt these new paradigms in teaching but it extends to include regular universities which try to use LMS to manage e-educational knowledge to its students.

Wikipedia presents that there is a life cycle for knowledge "starting with capture or creation, moving on to use and reuse with the ultimate goal of enriching an organization's capability" [3]. However, Using knowledge is not free of charge, there are three types of costs associate with knowledge use [4]:

- Availability which concern with getting knowledge to users;
- Accessibility which concern with opening knowledge for use;
- Applicability which concern with using knowledge effectively so knowledge is useful and meet user expectation.

This opens the domain to develop learning platforms and learning management system (LMS) that aims to serve as both communicative and informative media.

Section 2 of this paper presents common issues between knowledge management and e-learning. How knowledge is shared and manages via e-learning platform is discussed in section 3. Section 4 displays the learning management system architecture used at AOU. Section 5 and 6 present the influences of e-learning platforms on knowledge management and conclusion consequently.

2. KM & e-LEARNING COMMON ISSUES

It is important to outline the differences between e-learning systems and knowledge management systems because they are intended to be very different approaches to different topics. The most important difference is that e-learning systems and knowledge management systems are focused on two totally different goals.

- e-learning systems try to support learners in expanding their knowledge by providing structured learning content and intercommunication facilities to specific topics while knowledge management systems provide knowledge by using content management systems (CMS) with search and sort facilities and in addition some kind of collaboration with experts and other users on various topics.

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- e-Learning systems provide information for enterprise and human resources systems by gathering information about each learner using progress information in combination with tests and examinations. This can be used for skills management and a sort of career planning which is a component of the knowledge management system

On the other hand, there are a lot of similarities of the two concepts, e-learning and knowledge management systems provide knowledge in different forms to the users. This content can be reused, annotated, modified according to what is needed for different approaches. The system architecture is almost the same for both concepts. It is a client-server-architecture with high complexity in the server-part whereas the clients are having less complexity.

For both systems it is very important to provide communication and cooperation facilities. These vary from e-mail, chat rooms, forums, to other forms of cooperation. Also personalization plays an important role for both approaches. Relevant systems for both concepts support some kind of personalization either role-based or personal oriented.

To design content that can be used for both systems is one of the most important goals to get a better conjunction between those concepts. e-Learning content should not be just content designed to teach people but provide information in a sorted and structured context. This is exactly what knowledge management systems main target. Content of the knowledge management system can be seen as a kind of repository for content used in the e-learning approach.

3. SHARING KNOWLEDGE VIA LMS

An e-learning platform is "software or a combination of software that sits on or is accessible from a network, which supports teaching and learning for practitioners and learners" [5]. In educational context, the e-learning platform is also known as learning management system (LMS) or virtual learning environment (VLE) which is "often internet based, software allowing instructors to manage materials distribution, assignments, communications and other aspects of instructions for their courses" [6].

In recent years the need for learning management systems to deliver the courses online becomes a significant issue and the market of developing e-learning platforms has seen a great competition between companies. A lot of e-learning platforms products are found as: Blackboard [7], Moodle [8], FirstClass [9], Interact [10] and Sakai [11]. Some institutes develop their own LMS, others adopt an open-source LMS or bought a commercial one.

The e-learning platform is composed of mainly 3-tier model:

- Knowledge management (Database) tier, which is responsible to deal with knowledge transaction.
- Application tier, which represents the server that makes knowledge available to users and enforce system security.
- Presentation tier, which is the client web browser that makes knowledge accessible to users.

The way this LMS presents its knowledge is crucial in education process in terms of flexibility, easiness, and usefulness. In this

respect knowledge could be classified informative and communicative knowledge [12]. Informative knowledge is related to teaching modules such as module calendar, lecture notes, assignments, etc. and communicative ones is concerned with facilitating communication between different parties as exchange opinions in discussion forums, chat rooms, messages between students-students, student-tutor, tutor-tutor communication.

Davenport et al., [13] displayed four types of perspectives on knowledge management:

- Creating knowledge repositories that holds knowledge and information in documentary form
- Improving knowledge access and transfer, this concern with communication issues and the media in which knowledge is accessed and transferred
- Enhancing knowledge environment by integrating knowledge management by other computerized system in the organization.
- Managing knowledge as an asset to organization.

Comparing those perspectives with the above 3-tier model of e-learning platform leads us to view e-learning platforms as knowledge management tools.

To achieve a success learning outcomes, e-learning platform should take care off:

- Solving real world problem.
- Each piece of new knowledge must be based on existing knowledge and connects with it, so pre requests on previous knowledge is very crucial.
- Deliver new knowledge through demonstration and examples, knowledge must be connected to life applications
- Opportunities to learn come out by trying new learning and applying it.
- Connecting learning into the learners experience, this made by putting the new learning into the experience made by learners in their own language.

4. AOU e-LEARNING PLATFORM

Arab Open University was established in 2002 in the Arabic region, and adopted the open learning approach. An open learning system is defined as "a program offering access to individuals without the traditional constraints related to location, timetabling, entry qualifications." [14]. The aim of AOU is to attract large number of students who can not attend traditional universities because of work, age, financial reasons and other circumstances. The "open" terminology in this context means the freedom from many restrictions or constraints imposed by regular higher education institutions which include the time, space and content delivery methods.

Freed et al. [15] claimed that the "interaction between instructors and students and students to students remained as the biggest barrier to the success of educational media". The amount of interaction plays a great role in course effectiveness [16]. For this purpose and to reduce the gap between distance learning and regular learning, the AOU requires student to attend weekly tutorials. Some may argue that it is not open in this sense; however the amount of attendance is relatively low in comparison

with regular institutions. For example, 3 hours modules which require 48 hours attendance in regular universities, is reduced to 12 hours attendance in the AOU.

In order to give a better service to students and tutor, to facilitate accessing the required material from anywhere, and to facilitate the communication between them, an e-learning platform is needed. AOU has partnerships with the United Kingdom Open University (UKOU) and according to that at the beginning the AOU used the FirstClass system as a computer mediated communication (CMC) tool to achieve a good quality of interaction. The FirstClass tool provides emails, chat, newsgroups and conferences as possible mediums of communication between tutors, tutors and their students, and finally between students themselves. The most important reason behind using FirstClass was the tutor marked assignment (TMA) handling services it provided. However, the main servers are located in the UKOU which influences the control process, causes delays, and totally depends on the support in UKOU for batch feeds to the FirstClass system [17].

To overcome these problems, AOU use Moodle nowadays as an electronic platform. Moodle is an open-source course management system (CMS) used by educational institutes, business, and even individual instructors to add web technology to their courses. Both students and tutors can access the system from anywhere with an Internet connection. The Moodle community has been critical in the success of the system. With so many global users, there is always someone who can answer a question or give advice. At the same time, the Moodle developers and users work together to ensure quality, add new modules and features, and suggest new ideas for development [18, 19]. Moodle also stacks up well against the feature sets of the major commercial systems, e.g., Blackboard and WebCT [20]. Moodle provides many learning tools and activities such as forums, chats, quizzes, surveys, gather and review assignments, and recording grades.

Moodle has been used in AOU mainly to design a well formed virtual learning environment which facilitates the interaction among all parties in the teaching process, students and tutors, and more over to integrate the VLE with the student information system (SIS) and the human resource system (HRS) [21].

4.1 LMS Architecture of AOU

Learning management system is composed mainly of authoring tool (informative) and activities tool (communicative):

Authoring tool is mainly concern of the content, and in charge to publish any material related to educational knowledge such as:

- Creating files,
- Adding text,
- Adding clocks,
- Connecting to websites related to the course
- Content management

Activities tool is mainly concern about creation interaction mediums such as:

- Discussion forums,
- Chat rooms
- Quizzes

- Messaging system
- Submitting home works
- Grading
- Integrating with WAP technology

4.2 LMS users' classification

Systems' users could be arranged into 6 categories: administrator, creator, editing-tutor, non-editing tutor, student, and guest as shown in figure 1 where each one has different authorities and roles.

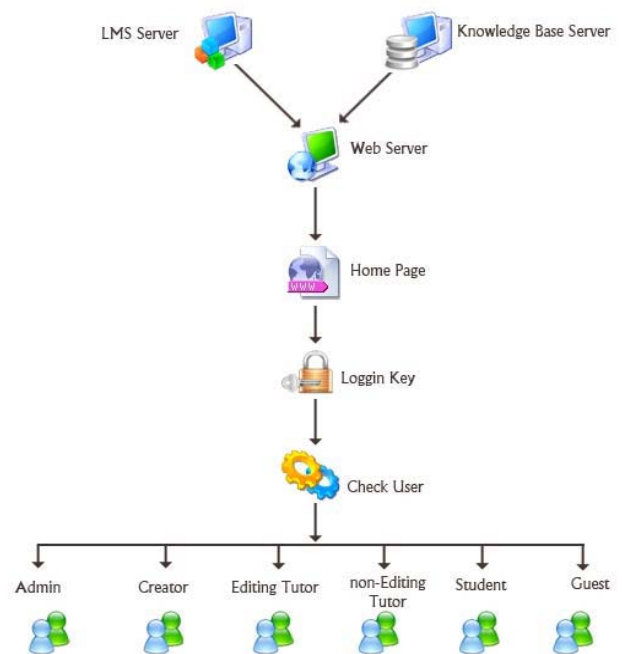


Figure 1. LMS users' classification at AOU

Administrator has an absolute authority as shown in figure 2 to do:

1. management of authoring services, this includes:
 - create course categories (each faculty is considered as a category)
 - create course sub-categories (departments inside faculty)
 - create course sections with its students and tutors
 - create course modules (teaching modules, blocks, lecture notes..)
2. management of activity service, this include:
 - add discussion forums
 - add chat rooms
 - add messaging system
 - add any required website link
 - add any activity offline or online for any course

3. management of general services, this includes:

- create new user names for new tutors, students
- add calendar
- add any news announcement

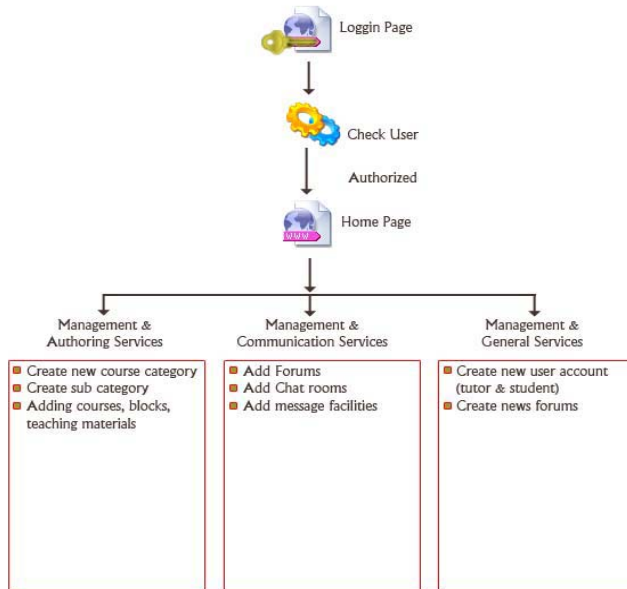


Figure 2. Administrator roles

Creator could be assigned at category level or course level, he is in charge of:

- Create course sections
- Add students to each section according to registration sheet
- Assign each section to a specific tutor
- Adding course materials such as blocks, glossary, and references
- Create the essential communication media as discussion forums, chatting, etc.

Editing-tutor can do all creation activities related to the course level that he is assigned to such as adding: lecture notes, references, assignments, online quizzes, etc.

Non-Editing tutor can use web site as it without any privilege to create new activities. However, he is able to insert grades for assignment quizzes, giving feedback to students, share in the discussion forums, etc.

Student can use the course website and:

- Download files
- Download assignment and re submit it after solving
- Doing online quizzes
- Fill in online questionnaire related to the course or to evaluate tutor

Student is playing the major role in discussion forums with other students and with his/her tutor.

Guest can observe the activities going on the site depending on his level as course level or category level but he could not do any interaction

Students and faculty who already use mobile computing/communication devices will find ways to integrate them into all aspects of their lives—including the tasks of teaching and learning. Educators can assist students by making content more readily available and in formats that are easily accessible through popular mobile devices. We should prepare to take advantage of their benefits in higher education by planning how best to employ mobile devices.

5. THE ROLE OF LMS AS A KM TOOL

The usefulness of the LMS is summarized as follows:

- Simplicity, easy creation and maintenance of courses
- Reuse, support of existing content reuse
- CMC, assignments, test, progress learner involvement
- Security, secure authentication/authorization
- Administration, intuitive management features
- Technical support, active support groups
- Language, true multi-lingual
- Affordability, maintenance and annual charges
- Reducing learning time
- Increased educational retention
- Consistency delivery of content through asynchronous, self placed e-learning
- Educational knowledge is communicated with good e-learning and knowledge management systems.
- Reducing over all cost associated with tutors salaries, meeting rooms' rental, and student travel.
- On-demand availability of knowledge
- Reducing stress of limited lecture time, so slow or quick learners both will be satisfied

However, there are also some forthcoming problems arise from the fact different LMS has different architecture, which implies the following obstacles:

- Transferring from one LMS to another means re-creating to same knowledge again which a waste of time and effort.
- Sharing information among systems in distributed universities is difficult
- Sharing student's record in case he/she wants to move to another university which use another LMS
- Comparing LMS systems is complicated since they use different terminologies to describe the same functionalities.

A future and promoted solution is to develop an independent framework which integrates the specification of different platform architectures as described in [27].

6. CONCLUSION

Recently, there has been a huge interest of different industries on the new era of knowledge management which become a crucial demand in different sectors. The growing demand on the information technology made huge attention to related domains

including knowledge management. On the other side, there was also a huge adventure in the educational domain which has its own revolution from the online industry. The new trend in educational institutes moves towards e-learning. This paper presented the knowledge management from computer industry perspective. Full descriptions of the learning management systems have been also presented including the experience of the Arab Open University of using different LMS. We focused on the role of LMS in general and its capabilities in the area of knowledge management. We hope that this paper contributed new information to fill the gap between the knowledge management and e-learning, specifically the role of the learning management systems as knowledge management tool.

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