KNOWLEDGE MANAGEMENT AND
E-LEARNING SYSTEM INTEGRATION

[1]Mohammed B. Ribadu [2]Abubakar Mohammed & [3]Suleiman Sa'ad
[12&3]*Department of Information Technology Modibbo Adama*
University of Technology, Yola

Abstract
Current knowledge management focuses on knowledge acquisition, storage, retrieval and maintenance. E-Learning systems technology today is used primarily to handcraft training courses about carefully selected topics for delivery to employees registered for those courses. Knowledge management is used to rapidly capture, organize and deliver large amounts of corporate knowledge. This paper investigates the integration of e-Learning systems and Knowledge Management technology to improve the capture, organization and delivery of both traditional training courses and large amounts of corporate knowledge. First, a model is proposed for the phases of knowledge management. That model is then enhanced with concepts and technology from e-Learning. The model subsequently illustrates real world scenarios that add increasing amounts of knowledge management to an e-Learning environment. Analysis of these four scenarios will help to better understand the practical relationship between knowledge management and e-Learning systems.

Keywords: *E-learning Systems, Knowledge Management, (KMS), Content Management System (CMS), Organizational Learning, Collaborative*

Background to the Study

For several years, e-learning has shifted from being a radical idea to something that is widely accepted as mainstream in the field of learning management system. It has become the major concern of numerous companies and enterprises and an important service offered by most high-level educational institutions around the whole world. E-learning systems has been evolving with the World Wide Web (www) as a whole and changing to E-learning, a new term coined by Stephen Downes (2005). E-learning derives from the overall e-learning trends in combination, which was defined by Tim O'Reilly (2005) for collaborative, user-centric content production and interactive content access.

However traditional e-learning's teach and learn model can't ensure the transfer of knowledge, especially the most valuable tacit knowledge. E-learning introduces new component social interactive network. This study aims to explore the critical role E-learning systems plays in tacit knowledge transfer, which will result in improving performance of knowledge management in enterprises. However, technology itself does not necessarily produce competitive advantages

unless it aligns with organization's human and business resource properly (Powell & Dent-Micallef, 1997). Therefore, the study also tries to investigate how organizations manage E-learning to confer sustained competitive advantages. It is hoped that this study will make contribution to the field of knowledge management and that it will be of great benefit to business managers in determining which business sectors are suitable for E-learning systems (Huang, 2009).

Interestingly, 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 of facilitating organizational learning. Researchers try to analyze the similarity of the goals, methods of assessment, and some knowledge sharing processes in both 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, 2004).

Objective of the Study
The objective of the study is about "Knowledge management and E-learning systems integration". To sum up, the purposes of this research are:
1   Integration of e-learning system and knowledge management capabilities delivery and powerful use of learning materials, knowledge management with e-learning system.
2   Improvement of learning efficiency through knowledge management and learning feedback.
3   Using knowledge management activity can cost less time in making teaching materials for teacher.
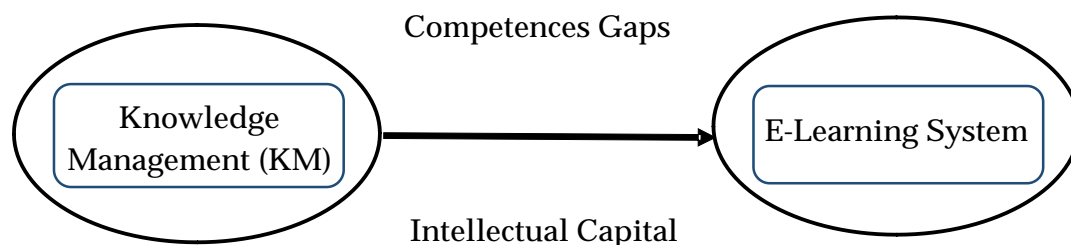

Figure 1: Competence Gaps between (KM) and E Learning System

This study discusses the benefits and more effective integration of E-Learning system and knowledge management capabilities, delivery and powerful use of learning materials and activities in the process of knowledge manipulation and exchange in institutions in order to provide organizational success and prosperity.

Literature Review
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). Abdullah et'al (2008) conducted a study in Klang Valley where results indicated that most of respondents perceived KMS as a new way to add value. The results indicated that the current state of KMS framework

implementation has been accepted. However, the finding also discovered lack of awareness to the current KMS implementation processes. This causes some of the applications, technological systems and audit, which are used in KMS, were not fully utilized and realized by the users. The modification on the existing KMS framework emphasizes more on KMS awareness and its roles. The finding has also showed the incentives and rewards of KMS (Abdullah et'al, 2008).

Civil (2000) stated that explicit knowledge can be expressed in words and numbers and shared in the form of data, scientific formula, specification and manuals. While, Yordanova (2007) presents and discuss basic issues related to creation, sharing and use of knowledge resources delivered by e-learning systems. Methods for development and exchange of knowledge resources as units of learning are presented. Influence of knowledge management processes in development of new forms of advance learning is described and the rationale for e-learning application in the knowledge management process in an organization or institution in order to facilitate organizational success and growth highlighted. Conclusively, common features of both fields, e-learning and KM are defined and capabilities for their better integration proposed and recommendation for future research outlined (Yordanova, 2007).

The interaction between the explicit knowledge and tacit knowledge is not totally different (Abdullah, 2008). This interaction is known as knowledge conversion. From the interaction that has been defined, Nonaka and Takeuchi (1995) came up with four modes of knowledge conversion which include:

1	Tacit knowledge to tacit knowledge (socialization): It is a process of sharing experiences, which creates tacit knowledge. E.g.: shared mental models and technical skills. It is done through observation, imitation and practices.
2	Tacit knowledge to explicit knowledge (Externalization): It is a knowledge creation process in that tacit knowledge becomes explicit knowledge. E.g.: concepts and hypotheses or models.
3	Explicit knowledge to explicit knowledge (Combination): It involves combining different bodies of explicit knowledge.
4	Explicit knowledge to tacit knowledge (Internalization): It is a process of embodying explicit knowledge into tacit knowledge and is closely related to "learning by doing".

For this purpose, is integration and Improvement learning efficiency through knowledge management system capabilities delivery and powerful use of learning materials and activities in the process of knowledge manipulation and exchange in institution in order to provide organizational success and prosperity?

Knowledge Management and KMS
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 the KM activity that involves generation, codifications and transfer (Davenport, 1997). KM is interested with the identification, acquisition, distribution and maintenance of substantial and relevant knowledge. Rowley describes the term Knowledge Management as follows: "Knowledge management is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the organization's objectives (Rowley, 2000). Drucker that concerned the term "knowledge society system" and began the discussion of the idea of managing knowledge in organizations. He claimed that knowledge would become increasingly social in nature (Drucker, 1994).

The KMS definition is a concept that can be used for creating knowledge repositories, improving knowledge access and sharing as well as communicating through collaboration and managing knowledge as an asset in learning organization (Rusli, 2005). KMS are special type of information systems that supports activities related to the acquisition, generation, codification, storage, transfer, retrieval, and use of knowledge within organizations. The idea of a KMS is to enable employees of an organization to have access to the company's knowledge of facts, sources of information, and solutions. Having employees share their knowledge could potentially lead to more effective problem solving and it could also lead to ideas for new or improved products and services (Tiwana, 2000). The goal of a KMS is to get the right information to the right people at the right time. This will increase efficiency leading to a competitive advantage. In other words, KMS are meant to support knowledge processes. These KM systems have been deployed in many organizations with the hope that they will have a positive effect on performance (Abdullah, 2008).

Knowledge Management Conversion (SECI) Model
In order to provide context, the SECI model is briefly summarized with examples, which highlight the challenges that many programmed management organizations face in establishing effective knowledge transfer systems. see Figure 2 summarized in the following: Socialization: is the process of sharing tacit knowledge through shared experiences. In programmed environments where knowledge transfer capabilities are low, communication tends to be intra-project team only. Communication between project teams is limited due to a highly competitive culture and a strong focus on achieving project goals over portfolio goals. Projects typically last for six months, which means that knowledge transfer is very slow because the opportunity to work with different personnel only arises approximately twice a year. Externalization: is the process of articulating tacit knowledge into explicit knowledge. When this occurs, knowledge becomes crystallized and accessible to all. A programmed management example is the documenting of project performance. Where knowledge transfer processes have had limited consideration, reporting processes are typically closed (i.e. restricted distribution), which limits externalization. The format of such reports tends to be heavily text-biased, which limits access due to the time required to study the document. Combination: is the process of converting explicit knowledge into more complicated and systematic sets of explicit knowledge. For example, the aggregation of project reports to form a programmed report or the aggregation of programmed reports in to a portfolio perspective. Access to such reports tends to be restricted to senior personnel, limiting the opportunity for many staff to gain an appreciation of programmed and portfolio level issues - to see the bigger picture and their role within it.
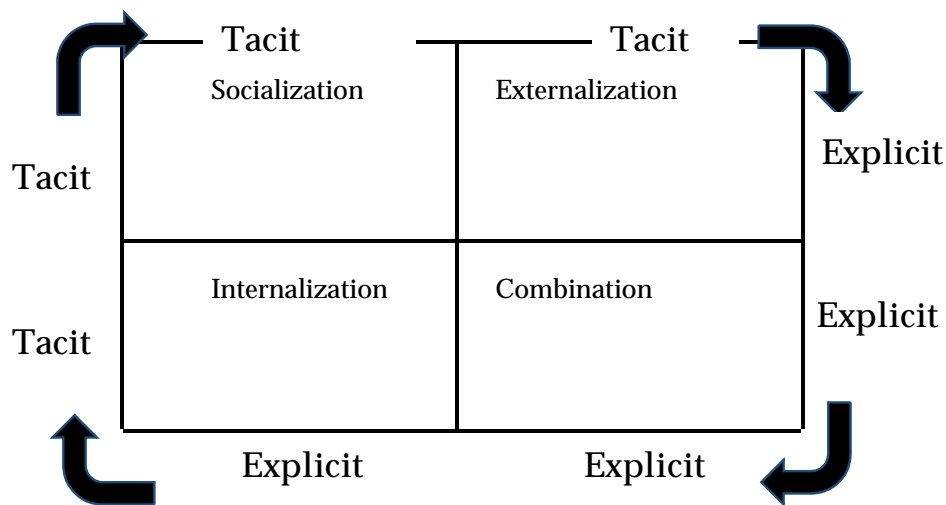
Figure 2: The SECI Process (Nonaka and Takeuchi, 1995).

Internalization: is the process of embodying explicit knowledge as tacit knowledge. This often occurs when explicit knowledge is practiced, or given context from an individual's history or experience. In environments where knowledge transfer is low, the richness of experience with which an individual can internalize is limited. In general, the speed of knowledge transfer (and therefore cycle speed) is low. A culture of knowledge protection prevails, which at an individual, group and organization level is suboptimal.
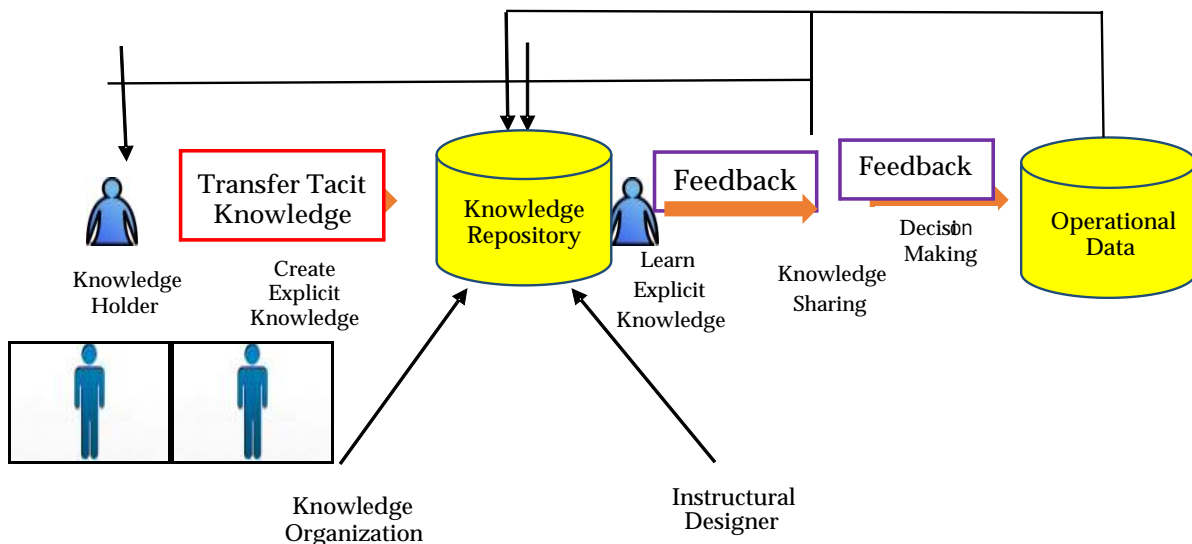
E-Learning Systems

The concept E-learning system can be defined as 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. E-learning system is essentially the network-enabled transfer of skills and know- ledge. 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. 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 support this construction process (Mihalca, 2008). Simulations close to the real world are the answer to constructivist learning theories, demanding situated learning with a high degree of engagement of the student. However, the use of computer technology to support learning leading to the development and creation of knowledge requires new pedagogical processes. Thus, the tendency towards technology driven development has led to a focus on the dissemination and acquisition of information. Pedagogic strategies and computer based technologies to support knowledge development and creation require development schema based on the needs of learners (Mihalca, 2008).

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 (Woelk, 2003).
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 o n l i n e 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.

Figure 3: e-Learning System Enhancements to KM
Figure 3 is a modified and more detailed version that represents the knowledge management phases with e-Learning system enhancements. Knowledge Holder can either transfer tacit knowledge to a Knowledge Seeker through socialization or create explicit knowledge and store it in a knowledge repository. The Knowledge Organizer in Figure 2 is a person (or software program) who relates the created Knowledge to other knowledge in the repository or further refines the created knowledge. 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. The Knowledge Seeker then 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 (Woelk, 2003).

KM versus e-learning
Simple development and delivery of learning resources can not satisfy requirements of information society of professionals skills achievement, knowledge sharing and exchange and gaining competencies in specific domains of science and real life necessary for individuals and organizational success and prosperity. That is way education has to be a process of sharing and acquirement of knowledge, skills and competencies. Advantages of KM are very useful for that process. Knowledge management is indivisible part of teams training so capturing of knowledge process is very similar to the processes related to selection of most appropriate learning content in e-learning. Outcome of effective learning process should be not only knowing facts for a separate subject but having practical skills and developing competency in the given domain so acquiring knowledge is more precise definition of the learning outcomes instead of learning facts for different related to domain topics. (Yordanova, 2007). Therefore KM processes should be more deeply and successfully integrated in learning content delivery and learning activities support. Otherwise, e-Learning system seems to be very important part of development of successful team. Learning on demand or just-in-time training is very appropriate forms of education at work. Activities involved in standard education have to be implemented in different types of trainings delivered at organizations and institutions.

 Integration of KM and E-learning System
The information technology and the Web is contribution concerning shared knowledge and the social life of learning. E-Learning system and KM was the social nature of constructing knowledge. He proposed the idea that people construct knowledge or understand the world through their interactions and experiences. Also the concept of social knowledge and looked at learning as a social and situated process (Huang, 2009).

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 system is the best way to help acquire the dynamic, distributed, shared and collaborative knowledge through the technological means to support this construction process (Carmean, 2008). Huang explain that technology could not create the gains hoped for in the

enterprise environment until system designers recognize that information is dynamic, situated and socially constructed. Enterprise knowledge must be negotiated and collectively constructed (Huang, 2009).

Common Characteristics of KM and E-Learning System

There are many common features and characteristic shared by both E-Learning system and KM. Yordanova (2007) explained that common characteristic are defined in the process of E-Learning system and KMS (collaboration, project development, Help desk, Learning Objects (LOs) use, for presentation of learning content and knowledge, and Content Management systems (CMS), Some of these are:

Virtual collaboration/synchronous: are one of the most important characteristics of successful education and team work include (synchronous and asynchronous) communication and different tools related to work in groups or different types of virtual communities. In education, students and teachers have to exchange information related to learning activities or specific topics of the proposed learning content. Participant in education involved in different types of groups have to exchange knowledge, skills and competences. Team members in an organization or institution have to send and receive important information or data related to their duties. Free exchange of knowledge and data and capabilities for collaborative editing of documents become even more critical when different members of the team are at distance (different offices, cities or countries).

Project development: tools and capabilities is critical for execution of different team and individual tasks and delivery of necessary data, information and document in time. As well as tools is very benefit in the process of education. It allows projects developed by students to be scheduled and implemented on time. Another advantage of their integration in education is students get used to work with the tools and they know which are strong points and drawback of project management tolls implementation in their work.

Content as Learning Objects (LOs): seem to be very appropriate technology for development and exchange of different types of information Learning Objects are discrete chunks of reusable online learning materials. A LOs or knowledge element as it is sometimes called can be a text document, an element of animation, a streaming video, audio or other form of online content. Creating central repositories of reusable learning objects using object oriented design and metadata and following the international standards for it, is serving the needs of both e-learning system and knowledge management. It as well raises the quality and effectiveness of education and work. On the base of vision of e-learning system proposed by Nichani and the concept of KM defined by Nonaka and Takeuchi (Nonaka, 1995), common characteristics of both fields are described as shown on Fig.4. Aytac added key ingredients emerge as important elements of a blended e-learning process shown on (Aytac, 2009).
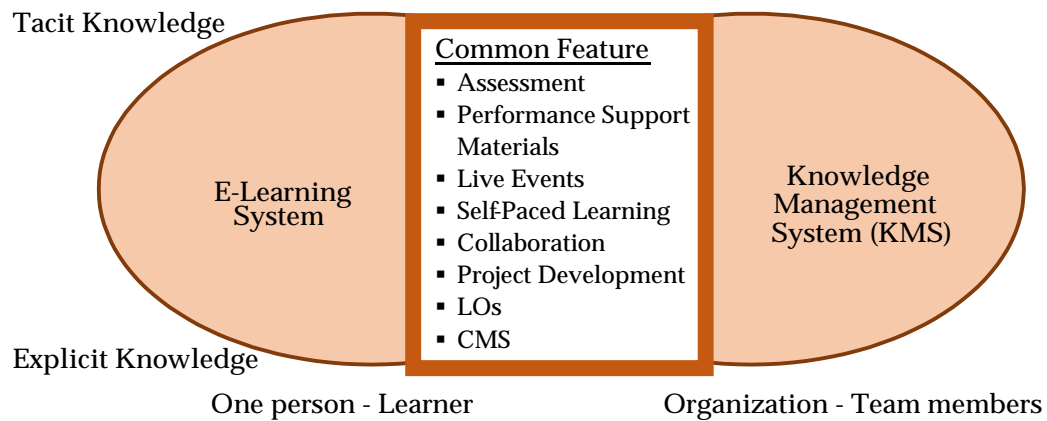
Tacit Knowledge

Common Feature
- Assessment
- Performance Support Materials
- Live Events
- Self-Paced Learning
- Collaboration
- Project Development
- LOs
- CMS

E-Learning System

Knowledge Management System (KMS)

Explicit Knowledge

One person - Learner   Organization - Team members

Figure 4: E-Learning system and KMS common features in context of explicit and tacit knowledge exchange

Assessment: A measure of learners?knowledge. Pre-assessments can come before live or self-paced events, to determine prior knowledge, and post-assessments can occur following live or self-paced learning events, to measure learning transfer.

Performance Support Materials: On-the-job reference materials that enhance learning retention and transfer, including PDA downloads, and printable references, summaries, and job aids.

Live Events: Synchronous, instructor-led learning events in which all learners participate at the same time, such as in a live "virtual classroom."

Self-Paced Learning: Learning experiences that the learner completes individually, at his own speed and on his own time, such as interactive, Internet-based or CD-ROM training.

Relationship between KM and LCMS
Learning Content Management System (LCMS) definition provided by Nichani common features of both fields are defined. There is a strong relation among (KMS), Content Management System (CMS), and Learning Management System (LMS). On the other hand these systems are environments where Virtual Communities (VC) as learners or team members communicate and collaborate. They use tools and functionalities of the systems to exchange ideas, skills, knowledge and competences and receive learning resources and other helpful services and tools. The virtual communities needs of knowledge and learning content exchange foster development of enhanced features of the systems and new technologies integrated in systems allow new types of communication and collaboration in the communities.
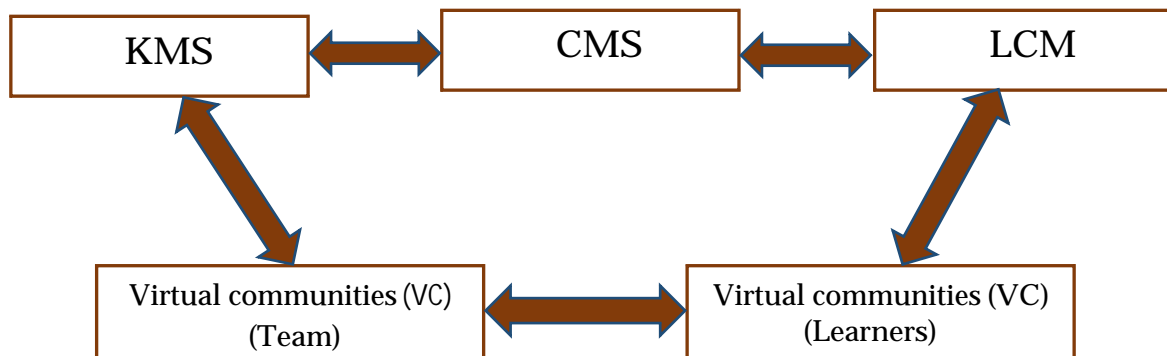
Figure 5: Relationship between LMS, CMS, KMS and VC

Systems and virtual communities are connected and influence each other, the Basic characteristics of virtual communities proposed by Wesley (2003) and described in (Antonova, 2006) can be defined as a compelling, clear business value proposition, a dedicated skilled leader, a coherent, comprehensive knowledge map for the core content, an outlined, easy-to-follow knowledge sharing process, an appropriate technology medium that facilitates knowledge exchange, retrieval and collaboration, communication and training plans for those outside of the virtual communities, an updated, dynamic roster of virtual communities members, several key metrics of success to show business results, a recognition plan for participants, and an agenda of topics to cover for the first months of existence. Described common feature are critical for satisfying needs of virtual communities VC and they are strongly related to their implementation in knowledge exchange processes and educational (Fig.5) (Yordanova, 2007).

Conclusion and Recommendation
This paper has illustrated how e-Learning system can be used to enhance knowledge management in an organization and provide the benefits of both. First, a model was presented for the integration of e-Learning system and knowledge management. The model was then applied to some real world scenarios to illustrate the benefits of this integration. Common characteristics of KM and e-learning system are defined on the bases of conducted review. At the end of the paper, relationship among different types of systems like KMS, CMS, LMS and organizational teams and learners as virtual communities are presented. In the Future, research efforts will be dedicated on exploration of how both fields e-learning system 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.

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