REVIEW ARTICLE

ARCHITECTURAL REVIEW ON KNOWLEDGE MANAGEMENT IN ACADEMIC INSTITUTIONS

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ABSTRACT

Recently the evolution of knowledge management has become increasingly important. Nowadays knowledge management has become interesting area for the research purpose for both researchers and practitioners. There are no unique and universally accepted definitions of knowledge management. Many researchers stated that knowledge management is like an engine which accelerates the performance of any organization and organizational economic growth. Knowledge management is the key achieving opportunities for better decision making and competitive advantage for organizations and also increase the efficiency and effectiveness of both educational and business organizations. There are several methods and techniques related to knowledge management are discussed in previous researches. In this approach, we looked at the developed model of knowledge management system as well as conceptual approaches of this expertise.

INTRODUCTION

Recently, the evolution of the knowledge management has become increasingly important and popular in organizations throughout the world. Knowledge management has become an important factor in national economic development in this information era. Knowledge management is a new immerging field in the academic environment. Consequently researchers and practitioners have found that knowledge management has a significant influence on organizational performance. All approaches to knowledge management are essentially looking at methods to manage the human interaction better. It is conscious integration of all human resources involved, all the academic processes and the technological advancements involved in designing, capturing and implementing the intellectual infrastructure of any organization (Ranjan *et al.*, 2007). Nowadays Knowledge management is one of the key concerns of all academic institutions. The main purpose of all academic institutions is to provide and share the knowledge. The term Knowledge Management was first introduced in Europe Management Conference in 1986 (Allameh *et al.*, 2011). It is the management of an organization for its knowledge resources, including the identification of specific knowledge, acquisition, development, storage, transfer, sharing, utilization and evaluation, to promote the enterprise

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tacit knowledge and explicit knowledge sharing and improving the technological innovation capability (Yuena *et al.*, 2012). As Knowledge Management has become a more central part of organizational activities and dependent upon technologies, securing organizational knowledge has become one of the most important issues in the Knowledge Management area (Lee *et al.*, 2005). There were an increasing application of electronic and web systems for education in recent years. The one way to educate people at their door step is only possible by e-learning. To increase efficiency of these systems and improve the education, using application of knowledge management in e-learning system. Today most colleges and universities have web-based (e-learning and on-line education) learning system. Many universities and higher education department are emphasizing on providing education at their door step using e–learning and on-line education. The business of academic institutions is all about knowledge.

Review of literature in this area

Literature review has been classified into three categories; knowledge and knowledge management concepts, knowledge management in higher education institutions and architecture of knowledge management models.

Knowledge

"Knowledge is a power to take action"

Knowledge is a power to take action and we can use it for the value creation. Many definitions has given by different author and its definition get changed as per time it needs and updating. There are various concepts, conflicting definitions and overlapping views among the researchers and practitioners, but central theme is still the same for all of them i.e. managing the knowledge and encouraging people to share the same to create the value adding products and services.

Knowledge Management

Knowledge management consists of mainly three components such as; people, process and technology. All of these are equally responsible for the success of any organization. Knowledge resides in people's head and the people process it with the use of technology and create a new value. People – manage the knowledge - people play the main and significant role in the knowledge management. People are main source of knowledge because knowledge resides in the mind of individuals. The willingness of people in sharing their knowledge with others is vital for the success of organization. Process - process is the step-by-step activity that facilitates its creation, storage, share and reuse knowledge within organization. Technology – have made it (knowledge) easier to acquire, create, share, store, and disseminate with others. Technology is to help people to share knowledge through the common storage such as knowledge-base. Managing Knowledge is main concern of the any university. Knowledge management (KM) is currently receiving considerable attention, from both academics and practitioners, and is being addressed by a broad range of academic literature. Yeh (2011) indicates two types of knowledge involved in higher education settings: academic knowledge and organizational knowledge. The primary purpose of universities is to foster academic knowledge. Organizational knowledge, on the other hand, is the overall business of the institution, incorporating its strengths and weaknesses, the market it serves, and factors critical to organizational success. Adhikari (2010) further defined knowledge management in the context of academic institutions as "the organized and systematic process of generating and disseminating information, and selecting, distilling, and deploying explicit and tacit knowledge to create unique value that can be used to strengthen teaching-learning environment". (Rubenstein-Montano *et al.*, 2000) classify knowledge management frameworks in three categories: descriptive, prescriptive, and hybrid. Prescriptive frameworks provide direction on the types of knowledge management procedures without providing specific details of how there procedures can or should be carried out. Descriptive approaches describe knowledge management, and identify attributes of knowledge management that can influence the success or failure of the initiative. Finally, hybrid approaches are a mixture of both the prescriptive and the descriptive approaches.

Knowledge management in higher education institutions

Knowledge management applied to Higher Education Institutions (HEIs) can bring about improvement in processes, such as the research process, curriculum development process, student and alumni services, administrative services, and strategic planning (Kidwell *et al.*, 2000). Jillinda *et al.* (2000) proposed the concepts of knowledge management in corporate sector and suggest that how does knowledge work in the organization. Author also compare the tacit and explicit knowledge and consider the new trends and technologies to implement knowledge management strategy in higher education. Using knowledge management tools and techniques in educational institutions and universities is as vital as it is in corporate sector. Jennifer Rowley (2000), examines the applicability of concepts of knowledge management to higher education institutions in UK and identifies the knowledge management facilities and benefits process system and projects which contribute to knowledge management in higher education Author argued that universities do have a significant level of knowledge management activities, and it is important to recognize these, and use them as foundations for further development, rather than to invent a whole new paradigm. A series of unrelated knowledge based activities is not sufficient. Universities and their staff must recognize and respond to their changing role in a knowledge based society. Universities need to be consciously and explicitly managing the processes associated with the creation of their knowledge assets, and to recognize the value of their intellectual capital to their continuing role in society, and in a wider global marketplace for higher education.

Bhatt (2001) categorized the KM into knowledge creation, knowledge presentation, knowledge validation, knowledge distribution and knowledge application activities. Author argued that KM determine the interaction between people, technology and techniques that allow an organization to manage its knowledge effectively by creating a nurturing and learning-by- doing kind of environment, an organization can sustain its competitive advantages. Steyn (2004) proposed a model for successful implementation of knowledge management in higher education institutions and also examines the use and benefits of knowledge management in educational organization. Author also believe that knowledge management is completely responsible for success of any organization, and also increase the efficiency and effectiveness of organizational services and help to produce new knowledge and ideas. It also maintains the academic and administrative services. Yaying Mary *et al.* (2005) explore that how a not-profit-organization can adopt the concept of knowledge management and subsequently measure the intellectual capital in private sector. Author said that KM helps an entity making the collective information and experience available to individual workers author provides a conceptual framework for KM in higher and categorized knowledge in two types; first is academic knowledge and second is organizational knowledge. Chalard *et al.* (2008), developed the Knowledge Management model for Quality Assurance and found that this model was successful. This model of Knowledge Management development in Quality Assurance consisted of 6 stages: 1) Team/Core-leader preparation, 2) building motivation and participatory working, 3) making the plans and developing team potential, 4) putting the plans into practices and developing works, 5) flow-up and upgrading the body of knowledge, 6) evaluation for conclusions. Rad and Hooshmand (2009) have discussed the linkage between problem-solving, adaptation and performance, this research demonstrates the relevance of problem-solving and decision-making theory in assessing the purpose of organizational knowledge management activities. The problem-solving process is the vehicle for connecting knowledge and performance; knowledge gains economic value when it is used to solve problems, explore opportunities and make decisions that improve performance. Lubega (2010) proposed a conceptual framework for using ICT to enhance KM in higher education and identified several outstanding

research issues to bridge the current existing gaps between the requirements of theory building and testing to address the different emerging challenges in using ICT to enhance KM in higher education. Author explores the relationship between higher education process, KM enabling ICT, KM processes, and KM outcomes.

Seyeed Farhad *et al.* (2011) developed the practical model for knowledge management in higher education. In this model there are seven stages mentioned teaching and attracting managers to create knowledge management, evaluation of knowledge level in higher education, creation of a knowledge perspective and cultural direction of higher education to implement knowledge management will be done with the help of knowledge teams. To implement the presented model, we should pay great deal of attention to information technology infrastructures (websites, weblogs, video conferencing, intranets and …) and also give the guidelines of knowledge management in higher education environments with the help of designing a conceptual model. They also proposed the idea of editing the knowledge management strategies in universities and higher education centers that lead to the growth of knowledge creation, augmentation of the quality of education and research-based activities, and constructive and scientific competition among the board of education. Ramanigopal (2012) stated that higher education has significant opportunities to apply knowledge management practices to support every part of their mission, from education to learning society to research and development. Knowledge Management about applying on the higher education, which a strategy to focus, on the KM is a key to integrate knowledge and skills into education system in universities. Dhamdhere (2015), discussed the present status of knowledge management in education sector in India, Initiatives taken by various government bodies, importance of knowledge management in education sector especially traditional colleges and universities, strategies used to capture students, teachers and processes knowledge and suggested knowledge management process for higher educational institute in India. The main source of generation of knowledge is human efforts which are developed through conducting good educational activities, research activities and generating innovative concepts in the area of interest.

Architectures of Knowledge Management Model

We start with a discussion on prior research of knowledge management models in the educational sector. Previous research on knowledge management model and architectures has enabled many educational organizations to conduct and implement knowledge management. This knowledge management approach provided as foundations for designing, developing and implementing knowledge management system in educational organization and achieves organizational goals. In the global market, knowledge management initiatives are used to systematically control information and expertise to improve organizational responsiveness, innovation, competency and efficiency (Karemente, 2007). Knowledge management system (KMS) is one of the most critical weapon to transform knowledge resources in organization into intellectual capital for competitive advantage and KMS model and architecture that would ensure the right knowledge could be acquired from and disseminated to the right people at the right time (Abdullah, 2005).

Mario pinto, (2014) proposed a KMS model framework which established a relationships between the knowledge management practices and processes and the technological tools that can leverage these issues promoting an environment that increase a culture of knowledge collaboration, sharing and discovery in several core activities of teaching, learning, research and administrative services and processes in a higher education institution. This knowledge management model consists of three layers such as (1) technological infrastructure (2) knowledge system and (3) knowledge management processes, promoting the processes of knowledge creation, storage, sharing and application. Peng *et al.* (2013) proposed a KMS model that supports web based learning platform. In this study the author organize the knowledge management model into four layers which are present service layer, web based learning platform layer, knowledge management service layer and infrastructure service layer. Infrastructure service layer applies storage, e.g. database for information record. Knowledge management service layer offers all kinds of services, i.e. storage service, document service, search service, identification service and group service for its clients and web-based learning platform. The course resource from web-based learning platform are stored and managed through KMS into storage. All kinds of clients are in present service layer to give service directly to users. KMS consists of three modules: individual knowledge management, group knowledge management and public management. Individual KM used by individual teacher or student to store and organize their documents or record their notes. Group KM used for a study or research team's file manage, the creator is natural top manager of the group, and he/she could assign different levels of permission to other group members. And the usage of Public KM is to manage an open knowledge resource.

Munir *et al.* (2012) developed KMS model for knowledge management system to improve university's performance. KMS is one way to organize and document the institutional knowledge by considering the following matters: content management, experience management, and process management. The knowledge management system architecture developed includes seven layers which are: Interface layer- transforms information to and from the KMS. It is the layer that connects users who use the KMS. User authentication- the security and restricted access is the part of this layer. Personalized page of KMS- it is meant to allow users more effective in accessing KMS and avoid overloaded information. Application- meant to accommodates the process of KMS. Transport layer- provides a basic functionality to synchronize and asynchronize communication and data sharing. Repository- is a place to storage and categorizes knowledge. The development was done by using a waterfall approach method and supported by Microsoft SharePoint software, which was considered to represent and have the characteristic of the required features: 1. web-based system development which can be accessed from anywhere 2. User authentication 3. Upload facility 4. Adjustment facility for user to make some adjustment according to their needs 5. Connected to other storage document system owned by UPI 6. Searching facility. Seyeed Farhad *et al.* (2011) developed the practical model for knowledge management in higher education. In this model there are seven stages mentioned teaching and attracting managers to create knowledge management, evaluation of knowledge level in higher education, creation of a knowledge perspective and cultural direction of higher education to implement knowledge

Architectural review on knowledge management by various authors table

Authors and Year	Classification	Findings
Beleviciute Inga (2008)	• Resource layer • Knowledge management process layer • User interface layer	The suggested three layers architecture is knowledge management processes centred. Practical implementations showed the flexibility and adaptability of the architecture especially for small- and medium-sized organizations. The architecture enables to use already existing ICT in organizations by adding new technologies and tools to support or improve the processes. Thus, it requires systems interoperability and keeping standards
Munir (2012)	• Interface layer • User authentication layer • Personalized page of KMS • Application layer • Transport layer • Repository	web-based system which can be accessed from anywhere and has features such as User authentication, Upload facility, Adjustment facility for user to make some adjustment according to their needs, Connected to other storage document system owned by UPI, Searching facility.
Peng (2013)	• Service layer • Web based learning layer • KM service layer • Infrastructure layer	KMS-THU has a server-client project structure for educational process; KMS offers all kinds of clients to bring a chance of ubiquitous learning. Framework of KMS-THU shows an approach of building an educational knowledge management system. KMS-THU has a server-client project structure. Server offers cloud service in Tsinghua. And among the clients, web client operates database directly of server by the interface online while other clients called off-line clients store the data (documents and document information) in local storage. Off-line clients utilize their local storage and do data transmission with the interface of KMS service via the synchronization mechanism based on wireless network on campus
Mario pinto (2014)	• Technological infrastructure • Knowledge system • Knowledge management processes	The proposed framework of KM seeks to establish a relationship between the KM practices and processes, and the technological tools that can leverage these issues, promoting an environment that increases a culture of knowledge collaboration, sharing and discovery in the several core activities of teaching, learning, research and administrative services and processes in a higher education institution.

management will be done with the help of knowledge teams. To implement the presented model, we should pay great deal of attention to information technology infrastructures (websites, weblogs, video conferencing, intranets and …) and also give the guidelines of knowledge management in higher education environments with the help of designing a conceptual model. They also proposed the idea of editing the knowledge management strategies in universities and higher education centers that lead to the growth of knowledge creation, augmentation of the quality of education and research-based activities, and constructive and scientific competition among the board of education.

Marjan Mansourvar (2010) presents the conceptual framework with the basic knowledge management system that includes some main components of a portal administration, decision support, document management, Web management, content communication, and programs. Developed web portal include three basic layers such as: user interface layer, portal core, and database repository. The main aims of this project included: Students in institutions of higher education need to access and manage electronic data. They need to use computers and have access to networks to retrieve training materials, databases, financial data, etc. Thus, a web portal for university students is essential to learning. It is also important for the university portal to be integrated with the university IT infrastructure, both internal and external. A university portal can be viewed as a single point, which provides comprehensive access to information on courses, data search tools, educational resources, interactive teaching materials, communication tools, etc.

Beleviciute Inga (2008) proposed the knowledge management system architecture centred on knowledge management process. In this architecture every process is supported by different kinds of technologies and all these technologies are integrated into the system. Proposed knowledge management system architecture is divided into three main layers and is centred to knowledge management processes – 1. Resource layer, 2. Knowledge management process layer, 3.User interface layer. At the user interface layer a knowledge worker connects and participates in the knowledge management processes by putting and receiving knowledge using web browser. The user interface depends on the user role in the KMS. Knowledge management process layer – it uses (Alvi and Leinder, 2001) knowledge management processes in the KMS architecture such as: creation, storage/ retrieval, transfer and applying. The resource level contains knowledge base, files systems, documents repository, data base, etc. This level depends on organization resources repositories.

Conclusion

Many of the architectures of knowledge management model described above are layered. Some of them are technology oriented and some of them are service oriented or componental. From the above review it is clear that to facilitate more easy and expressive creating, sharing, storing, transferring and reusing of knowledge and its management, knowledge management implementation of knowledge management is required. A Knowledge Management Model having capability to improve of education, enhanced awareness for sharing and coordination of new knowledge

approaches by using best utilization of the resources. Ultimately this effort will helpful to increase the performance of knowledge holders. The study would also be helpful to new researchers in coming future challenges. On the basis of this study new paradigms in educational organizations are needed as structure, management, and research are all combining to make changes in education.

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