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The Presentation of a Suitable Model for Creating Knowledge Management in Educational Institutes (Higher Education)

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Abstract

The purpose of this article is to evaluate the status of higher education to establish knowledge management. The present study, with its descriptive model, investigates the situation in Islamic Azad University regarding organizational culture, information technology, organizational structure and human resources in order to establish a suitable model for knowledge management. The statistical population of this study includes all members of the board of education and the staff of the Islamic Azad University Tehran Central Branch. In order to analyze the research questions, the researcher made use of descriptive and inferential statistics. The findings of the research indicated that in the above-mentioned university, the situation of human resources is suitable, the status of organizational structure and culture is average and it is poor for that of information technology for the application of knowledge management. Finally, based on the research results, the executive model and the stages and steps of implementation of knowledge have been presented.

Key Words: Knowledge, Knowledge Management, Organizational Culture, Organizational Structure, Human Resources, Information Technology and Higher Education

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1. Introduction

The great present evolutions in societies have led the educational institutions to being concerned with educational activities so that they can create new knowledge and are able to solve their problems and overcome the challenges. The high speed of change, expansion of knowledge and increasing demand for technologic awareness have dramatically influenced the development of flexible work force and the nature of all other issues in educational institutes. Thus, educational institutes have benefitted from the strategies and techniques used in private and commercial sections in order to achieve the advantage of a stable competition along with the creation of strategic knowledge from innovations. One of these innovations is the function of knowledge management in educational institutes (higher education)(Kazar,2000). On the other hand, today knowledge is considered as a regard of stable competition source(Harris, 2006).

Therefore, educational institutes can enter the competition and attain higher degrees of quality, innovation and functionality by means of using knowledge management(Psarras, 2006).

Hence, universities and their staff need to pay more attention to their changing role in today's knowledge-based society. Universities should play a pre-acting role in order to access knowledge, specifically general knowledge(Rowley,2000). Using experimental models related to the innovative approaches of knowledge management, regardless of the required preparations and considering their strengths and weaknesses, will often face failure (Park,2006) . Consequently, taking the conditions and characteristics of universities into account is inevitable in order to lead them to knowledge. The aforementioned elements led to the investigation of the present situation of higher education and presenting a practical guide to implement knowledge management in higher education.

The most paramount essentialities of this research include:

1. Identification of the guidelines of knowledge management in higher education environments with the help of designing a conceptual model.
2. Recognition of the current situation in educational institutes and higher education centers for the purpose of presenting knowledge management strategies in universities.
3. Editing the knowledge management strategies in universities and higher education centers that lead to the growth of knowledge creation, augmentation of the quality of educational and research-based activities, and constructive and scientific competition among the board of education.(Jarar,2002).

Now that the significance of knowledge and its management in higher education is of no doubt, the following question will be posed: How can knowledge management be created in an educational organization (higher education)?

Regarding the above-mentioned points, in the present study, concepts of knowledge management, various models related to knowledge management, research findings, and findings of different researchers in the field of knowledge management were discussed in higher education. Afterwards, the current situation of higher education for the creation of knowledge management was scrutinized regarding organizational culture, information technology, human / and organizational structure; and finally based on the findings of the research, the suitable model for the formation of knowledge management in higher education was presented. Accordingly, the researchers posed four major questions to serve the main purposes of the study, which are as follows:

1. How is the situation of information technology in higher education (Azad University) for establishing knowledge management?
2. How is the situation of organizational structure in higher education (Azad University) for establishing knowledge management?
3. How is the situation of human resources in higher education (Azad University) for establishing knowledge management?
4. How is the situation of organizational culture in higher education (Azad University) for establishing knowledge management?

The Conceptual Framework of Knowledge Management in Educational Institutes

Knowledge is a very complicated issue regarding its creation, expansion, and its institutionalization; so it has attracted a great deal of attention both in academic literature and in management(Maponya,2004). Some scholars believe that although the concepts of knowledge management and organizational education have always been of great significance in industry, there has been little attention to the application of knowledge management and organizational education in educational organizations. Today, there is a lot of focus on organizational education, knowledge management, organizational ability and industrial knowledge in order to create new knowledge(piccoly&Ahmad, 2001). Knowledge is a strategic possession which needs to be guided in all educational institutes, especially higher education (Tikhomirova, 2008).

Knowledge management is utilized for the examination of the overlap and communication among professors, students, educational courses and plans in educational settings and it also provides the organization's movement towards the educating organization (Psarras, 2006). Knowledge management refers to those actions that are systematically taken for the purpose of finding and organizing the intellectual wealth of the organization and making it accessible; and also for the reinforcement of a continuous education and learning system.(Sharifuddin & Rowland , 2004) The most prominent goal of knowledge management is the quick, effective, practical and innovative operation of sources of knowledge, infrastructures, processes and technologies along with academic targets.(Tikhomirova, 2008).

Based on all the points discussed above, various models have been presented in the field of knowledge management.

Gartner Group (2001) has presented a multi-layer architectural knowledge management model in one of their reports. In the lowest level, the intranets and extranets, that include network service stations, are used as a station for sending functional programs of knowledge management. In the next level the system components contain data stations and functional programs of the work group (the former deals with the data and the latter with helping people in work groups). This section is called knowledge retrieval in Gartner Group's architecture that includes the operation of documents and data stations (to deploy different data and informational possessions of the organization), knowledge retrieval operations and perceptual (mental) and physical (operational) knowledge plans. On top of the knowledge retrieval level in functional business plans, a web-user interface is utilized. Two points are of great concern in this model; first, the Gartner Group knowledge management architecture contains functional and service plans. Second, knowledge retrieval has been added to the information technology infrastructure and the architectural center of knowledge management as a new section.(Muorali,2005).

Gupta, Sharma and Hesso knowledge architecture model (2003): this model includes three layers (the layer of knowledge presentation, knowledge management and data sources) and has been designed on the basis of web and focuses on the overlapping operational ability of system components and supports the following issues:

- Access to internal and external information sources
- Sources including explicit knowledge
- Processes and supportive tools to attain, refine, categorize, store, retrieve, publicize and present knowledge
- Individuals in the organization dealing with knowledge, including knowledge facilitators, knowledge guards and knowledge engineers.

Organization capability model: In order to assure the success of the activities taking place in the field of science, we need to recognize and evaluate the necessary organizational capabilities to perform these activities. The recognized capabilities in this model include knowledge infrastructural capabilities (culture, structure and technology) and knowledge process capabilities (knowledge attainment, knowledge transformation, knowledge application and knowledge conservation).

The major challenge of knowledge management is the transformation of implicit to explicit knowledge. In general, there are many various viewpoints regarding the manner of representation of implicit knowledge. Some

scholars (e.g. Kim et al) believe that incidental and implicit knowledge has a representational nature; whereas others (like Nonaka, Rain, Moler and Seno 2000; Vicari and Troilo 2000; and Kidol Vender Lind and Johnson (2001) directly or indirectly suggest that incidental knowledge cannot be coded easily and the possibility of transmission in this regard is very low. As Heath 2003 states, one of the targets of knowledge management is to assure that "implicit" knowledge is collected and shared in the organization.(Heath,2003)

Table 1. A Summary of Previously Carried-out Studies Regarding Knowledge Managemnet in educational Institutes

Researchers	Title of Research	Findings
Yaying and Yung (2005)	The study of application of knowledge management systems in a private higher education institute in Taiwan	To achieve a multidimensional strategic model for knowledge management along with the perspectives of the higher education institute using brainstorming sessions with members of board of education, the importance of leadership.
Mac Carthy (2006)	The evaluation of functional strategies and processes of knowledge management in higher education in Nova University	The synthesis of knowledge management innovations in the organizational culture of higher education institutes
Coukos-semmel (2006)	The functional processes and strategies of knowledge management used in the US Universities	The strategies of knowledge management in higher education environments: leadership, technology, culture and evaluation.
Martin (2006)	Editing knowledge management strategies in higher education	Protection of spiritual possessions of the organization, encouraging the process of knowledge creation and its application for academic learning and teaching.
Piccoli et al (2007)	Presentation of a framework or model for the expansion of knowledge management in higher education institutes.	Creation, management and transformation of knowledge regarding the activities of board of education and students in a web-based virtual environment. Search engine, production engine and learning engine are the three main components of this model.
Praba Nair (2009)	Presentation of APO (Asian Productivity Organization) knowledge management framework model.	To emphasize the key elements of the success in knowledge management, culture, human resources, information technology and leadership.

2. Research Methodology

Research Method: This research was of a descriptive survey nature.

Statistical population, sample, and sampling method: All members of the board of education and staff in Islamic Azad University Central Tehran Branch (including 1953 people) form the statistical population of this study. The number of participants of this study was determined as 318, using Morgan Table and these participants were selected from among the statistical population using the hierarchical random sampling.

Research Instrument: The instrument that was used for data collection in this study included a questionnaire that was designed by the researcher based on the Likert scale. The highest mark for the options was 6 and the lowest was 1. The questionnaire, including 47 questions each with 6 options, was designed to scrutinize the present situation of organizational elements of knowledge management (organizational culture, information technology, organizational structure and human resources) in Islamic Azad University. In order to validate the questionnaires Content Validity was calculated. Also the reliability of the questionnaire was calculated using Cronbach Alpha formula and the result was 95.6.

Data Analysis: In order to analyze the data of this study descriptive and inferential statistics were utilized including, Standard Deviation, Mean, Median, and Variance. Moreover, a single-variable t-test, t-test for the independent group and variance analysis were also used.

3. The Findings

The Frist Research Question: How is the situation of information technology in Azad University for establishing knowledge management?

H_0: M≤3.5
H1: M>3.5

Table 2: The results of the t-test for the single group in order to compare the present situation of information technology, human resources and organizational culture with the determined average

The Index Variable	Number	Mean	Standard Deviation	Degrees of Freedom	T	Level of Significance
Test Value=3.5						
Information Technology	320	3.1776	.66338	319	-8.695	.000
Organizational Structure	320	3.4661	.75021	319	-.807	.420
Human Resources	320	3.8984	.69265	319	10.290	.000
Organizational Culture	320	3.4109	.84730	319	-1.880	.061

The results of the t-test in Table 2 indicates that the calculated t with the degree of freedom of 319 and confidence interval of 0.05 is bigger in number than the t critical (1.96). Therefore, the null hypothesis that stated there is no difference between the sample Mean and the theoretical Mean (3.5) is rejected and it is concluded that there is a significant difference between the sample Mean and the population Mean, implying that the sample Mean is significantly smaller than the population Mean. Consequently, the situation of information technology in Islamic Azad University is not in a good condition for establishing knowledge management system.

The Second Research Question: How is the situation of organizational structure in Azad University for establishing knowledge management?

The results of the t-test in Table 2 indicate that the calculated t with the degree of Freedom of 319 and confidence interval of 0.05 is smaller in number than the t critical (1.96). Thus, the null hypothesis that stated there is no difference between the sample Mean and the theoretical Mean (3.5), is confirmed and it is therefore concluded that there is no significant difference between the sample Mean and the population Mean. Consequently, the situation of organizational structure in Islamic Azad University is at an average level for establishing of knowledge management system.

The Third Research Question: How is the situation of human resources in Azad University for establishing knowledge management?

The results of the t-test in Table 2 indicates that the calculated t with the degree of freedom of 319 and confidence interval of 0.05 is bigger in number than the t critical (1.96). Therefore, the null hypothesis that stated there is no difference between the sample Mean and the theoretical Mean (3.5) is rejected and it is concluded that there is a significant difference between the sample Mean and the population Mean, implying that the sample Mean is significantly bigger than the population Mean. Consequently, the situation of human resources in Islamic Azad University is appropriate for establishing knowledge management system.

The Fourth Research Question: How is the situation of organizational culture in Azad University for establishing knowledge management?

The results of the t-test in Table 2 indicate that the calculated t with the degree of Freedom of 319 and confidence interval of 0.05 is smaller in number than the t critical (1.96). Thus, the null hypothesis that stated there is no difference between the sample Mean and the theoretical Mean (3.5), is confirmed and it is therefore concluded that there is no significant difference between the sample Mean and the population Mean. Consequently, the situation of organizational culture in Islamic Azad University is at an average level for establishing knowledge management system.

The Suggested Model

According to the studies in theoretical basics, the background of research and the suggested model of Faradji in operational units of Petroleum Ministry were edited in the following way (Knowledge Management-Based Model for Improving Productivity in Operational Units of Petroleum Ministry). This model included two sections; knowledge management process and organizational components and is based on computer reasoning and network principles. Implementation of such model requires a series of preliminary, software-based, management, and counseling activities to be done successively. The components and elements of knowledge management process (systems) and organizational components of knowledge management have been briefly explained in the following part. (Figure 1)

The components of knowledge management process

- **The System of Entryand Reading of Knowledge:** Every individual must be able to enter his knowledge to the system in form of audio, video, and written files and maps. Afterwards, it should be sent to the supervisors and they will mark the file regardless of its owner; therefore according to the system decision and based on some specific calculations, it will be accepted, rejected or conditionally accepted. The accepted knowledge files will be placed in knowledge bank for the users.

- **coring System** : The system should provide the capability of evaluation of the entered knowledge in a way that every knowledge file is presented to the most appropriate individuals and is scored based on a special mechanism.

- **Ordering System:** Every individual should be able to see the knowledge plan of the organization, the organizational unit and the individuals, regarding the limits determined for his access. The ordering system is in a three dimensional format, which determines the level of education, experience and knowledge production level for every individual.

- **Knowledge Categorization System:** The entered knowledge will automatically be categorized and the possibility of extracting different knowledge packages will be provided for the users regarding their access limits.

- **Rewarding System:** In order to persuade the staff to use the system and enter their information, motivational stimuli must be used. Financial rewarding system is one of the best motivational rewards in the software.

- **Reporting System:** Regarding their access, managers can read different reports about the organization's knowledge, organizational unit, groups and individuals. They can, moreover, receive full reports on the production level of organizational knowledge.
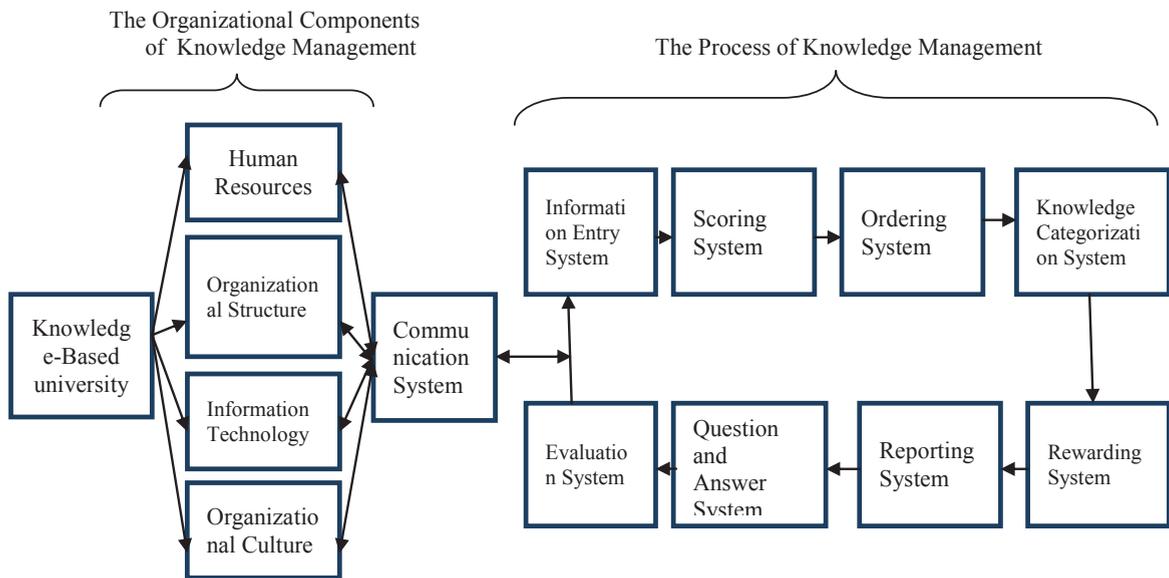
Figure 1. The Administrative Model of the Implication of Knowledge Management in Higher Education

- **Question and Answer system:** All users should have the opportunity to pose their questions to the system. This is in case the users cannot find their answers in the knowledge entries. After posing questions and determining its related field, the system will send it to the most appropriate people to answer; and consequently the person can get to his/her answer.

- **Evaluation System:** In this section managers can evaluate the degree of knowledge based on a qualitative index and can also dynamically be aware of the shortcomings of knowledge.

- **Communication System:** This system provides the opportunity to form virtual knowledge groups, create a relationship between knowledge management teams (systems) and organizational components of knowledge management (organizational structure, human resources, culture and information technology in universities).

The Organizational Components of Knowledge Management

1. **Human Resources:** It is the main element of knowledge management in different levels as the advanced individuals in the organization dealing with knowledge.(Holsapple,2006).
2. **Organizational Structure:** In this model, by structure, it is meant both formal and informal structures and trust systems. An influential knowledge management structure can lead to creativity and the ability of compatibility in the organization.(Alavi,2006).
3. **Information Technology:** In this model, by information technology, we mean the beneficial information about technology and communicative systems.(Holsapple,2006).
4. **Organizational Culture:** In this model, by culture we mean viewpoints and organizational values toward learning and knowledge transformation.(Allee,2000).

The Stages and Steps for the Implementation of Knowledge Management in Higher Education

Achieving the fundamental purposes of the project and the suggested model requires going through and paying attention to some stages. In this section the stages and steps of implementation of knowledge management that include seven parts will be explained comprehensively and is generally illustrated in Figure 2. The presented stages also include some comments and the five-stage model (presented by Lorenzon et al 2005).

First Step: Teaching the Concepts and Attracting Chancellors' Attention
Performing every plan in an organization needs attracting the attention of managers and teaching them some concepts. Therefore, at the very beginning of the plan, collaborative educational workshops need to be held in order to familiarize the board of education with the model.(Schein,1996)

Second Step: Evaluation of the University's Knowledge
After the familiarization and the companionship of macro-management with medial managers, the present situation will be scrutinized transparently. In this phase, some questionnaires about the general situation of the university will be distributed amongst the staff and the professors. The results will be imported to a dynamic computerized system and the knowledge growth graphs will be attained as the output. The aforementioned graphs will be analyzed by knowledge management experts and the strengths and weaknesses of the university in different aspects such as structure, technology and human knowledge will be determined.(Lopes,2001).

Third Step: Constitution of Knowledge Team
After the evaluations, done by knowledge management experts and chancellors, the favored scenario and the next step to be taken will be agreed on. Then the knowledge management team will be elected from among the members of board of education, considering the needs of the scenario. The team members will include staff members, executive managers, medial managers and managing directors.

Fourth Step: Determining the Roles of Knowledge Team Members
In order for the transparency of individuals' roles, some meetings should be held to assure that they have totally understood their roles in the knowledge management system.

Fifth Step: Illustration of the University's Knowledge Perspective
According to the accepted scenario, the knowledge perspective will be illustrated and the strategic plan will be determined in accordance with facilities, limitations, weaknesses and strengths of knowledge (ATSO). Afterwards, bylaws will be designed and notified in order to implement knowledge management in a part of university.(Wiig,2002).

Sixth Step: Creating Organizational Culture for the Implementation of Knowledge Management System
By organizational culture, a system of common inference is implied that members have to an organization. This characteristic causes the two organizations to separate. It also includes a collection of traits that are of great value to the organization.(Stephen,1998).

Seventh Step: Implementation of Knowledge Management System Using University Facilities (individuals, managers, processes, data stations and technologies) and Performing the Suggested Model
At first the plan should be piloted with the staff members who simply react to changes and challenges. Moreover, the people involved in the main project must have participated in the piloting. At the final phase of piloting, the expectations of the people involved in the project and the purposes of the project should be determined and the results of the piloting should be evaluated and reported to the managers.(Bukowits,2006).
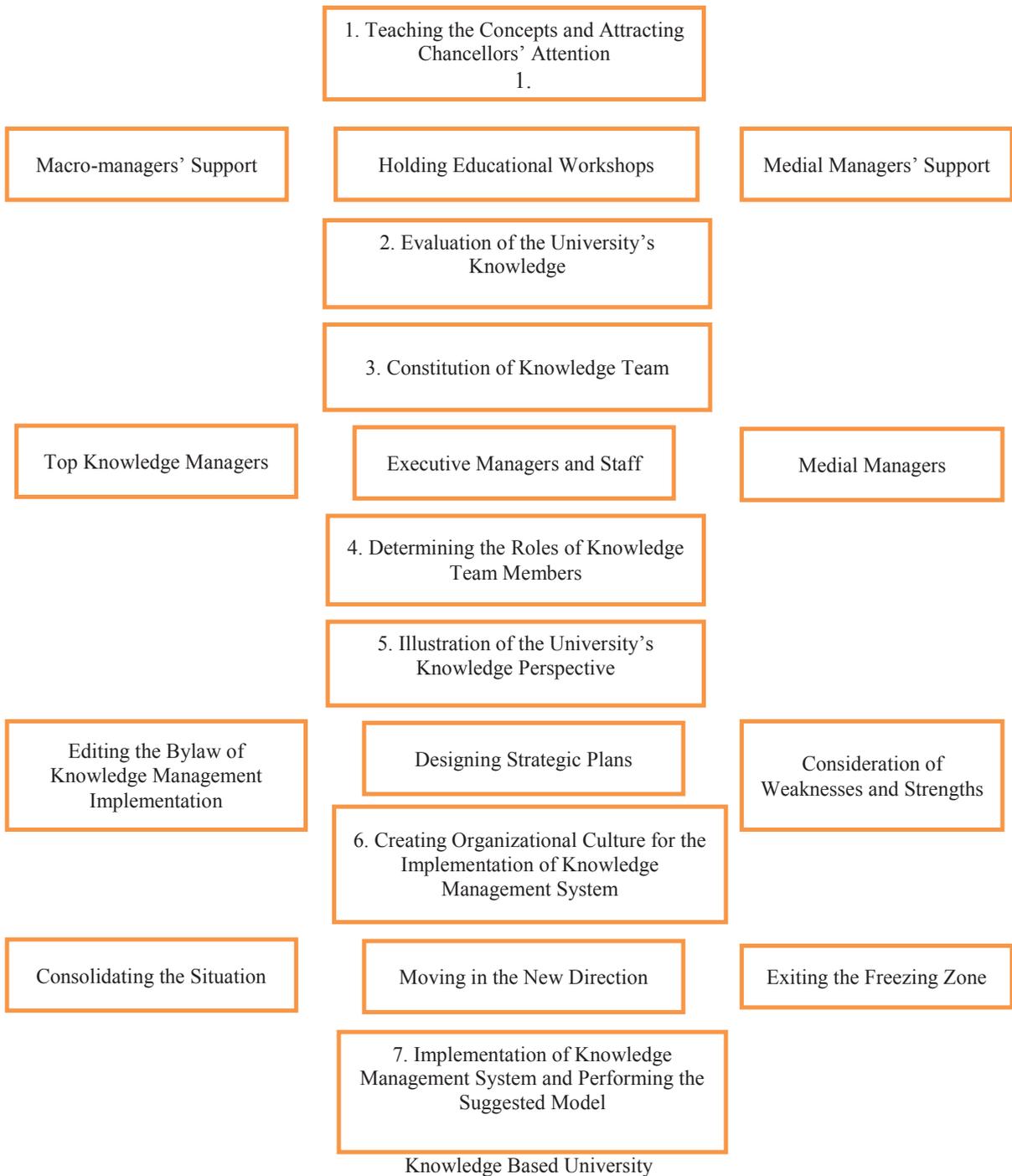
	1. Teaching the Concepts and Attracting Chancellors' Attention 1.	
Macro-managers' Support	Holding Educational Workshops	Medial Managers' Support
	2. Evaluation of the University's Knowledge	
	3. Constitution of Knowledge Team	
Top Knowledge Managers	Executive Managers and Staff	Medial Managers
	4. Determining the Roles of Knowledge Team Members	
	5. Illustration of the University's Knowledge Perspective	
Editing the Bylaw of Knowledge Management Implementation	Designing Strategic Plans	Consideration of Weaknesses and Strengths
	6. Creating Organizational Culture for the Implementation of Knowledge Management System	
Consolidating the Situation	Moving in the New Direction	Exiting the Freezing Zone
	7. Implementation of Knowledge Management System and Performing the Suggested Model	

Knowledge Based University

Figure 2. The stages of knowledge management implementation in higher education (The major stages suggested by authors)

4 . Conclusion

The research findings reveal that the situation of organizational structure and culture is at an average level; and the situation of human resource is appropriate to for the function of knowledge management. The determination of these components as vital factors of knowledge management in an educational environment can be considered compatible with the findings of previous studies by Praba Nair (2009), Muorali, Terry and Lone (2005) and Kidol et al (2006).

Information technology does not have the appropriate situation in the under-study university to apply knowledge management. This agrees with the findings of Coukos Semmel's study (2006) and that of and Piccoli et al (2007) and also the related literature that all indicate the application of technology in knowledge management strategy.

According to the findings regarding the influence of components of information technology, organizational structure, human resource, and organizational culture on the development of knowledge management at university, it should be taken into account that changing a university to a learning organization and implementing knowledge management is not an immediate action. However, regarding human mind and thought, primarily the cultural preparations should be made. Then we should make the mind of managers, members of board of education, students, and staff dynamic, in order to consolidate a learning university.

In the present study, the practical model for knowledge management in higher education is illustrated in figure 1 and the details are briefly discussed. In this model the minimum medium has been provided for sharing knowledge. Furthermore, the access limits for every individual is transparently definable. Afterwards, the stages and steps for the implementation of knowledge management executive model are presented. In the seven stages mentioned in figure 2: 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 …). Other factors can be of great significance in performing and developing this model, like managers' beliefs about the necessity and importance of motivational methods (providing the necessary financial sources), defining the issue in different levels in the organization, emphasizing the importance of teamwork in university by holding educational workshops for the members of board of education, performing regular educational workshops, identifying knowledge sources and procedures of changing personal knowledge to organizational knowledge, providing the culture of knowledge sharing, persuading the university staff to take part in professional seminars and conferences, creating suitable bylaws, primary acceptance of the organization and other similar points.

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