Exploring the Application of Knowledge Management Factors in Esfahan University's Medical College

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Abstract—In this competitive age, one of the key tools of most successful organizations is knowledge management. Today some organizations measure their current knowledge and use it as an indicator for rating the organization on their reports.

Noting that the universities and colleges of medical science have a great role in public health of societies, their access to newest scientific research and the establishment of organizational knowledge management systems is very important.

In order to explore the Application of Knowledge Management Factors, a national study was undertaken. The main purpose of this study was to find the rate of the application of knowledge management factors and some ways to establish more application of knowledge management system in Esfahan University's Medical College (EUMC).

Esfahan is the second largest city after Tehran, the capital city of Iran, and the EUMC is the biggest medical college in Esfahan.

To rate the application of knowledge management, this study uses a quantitative research methodology based on Probst, Raub and Romhardt model of knowledge management. A group of 267 faculty members and staff of the EUMC were asked via questionnaire. Finding showed that the rate of the application of knowledge management factors in EUMC have been lower than average. As a result, an interview with ten faculty members conducted to find the guidelines to establish more applications of knowledge management system in EUMC.

Keywords—Knowledge, Knowledge Management, Knowledge Management Factors.

I. INTRODUCTION

IN recent times knowledge management (KM) has emerged as a new authority and generated great interest among academics and management [1].

During the past ten years, many national governments, departments and agencies have adopted KM practices. Their mission was to create more innovative and complex systems that can connect people to information and knowledge [2].

Knowledge management has been considered as a major tool to enhance the performance of organizations [3], and organizational success and failure can often depend on accessing relevant information in a suitable approach [4].

II. KNOWLEDGE MANAGEMENT

In order to understand KM, it is critical to understand knowledge and how it is different from data and information.

Skyrme (2003) defined data as explanation or facts that were out of context. Therefore, data are perceived as raw facts without any meaning [5]. Davenport and Prusak (1998) defined information as data that makes a difference. Information has more value than data and adds context through relationships with data [4]. "Knowledge, while made up of data and information, can be thought of as much greater understanding of a situation, relationship, causal phenomena, and the theories and results that underlie a given domain or problem" [6].

III. EVOLUTION OF SOCIETY TO KNOWLEDGE MANAGEMENT

Druker (1993) was on this belief that there were three significant eras. The agricultural era, which lasted through the late 1800s; the industrial era, which began in the late 1800s and lasted until the early 1960s; and the information era, which started in the late 1960s and still continues. The acquisition of land and the production of food were the major concerns of the society in agricultural era. The industrial era brought mechanization and mass production factories. Information technology comes from the knowledge era. In the knowledge era, competitive advantage is gained from unique knowledge and the ability to learn faster than the competitor [7].

As society evolved from the agricultural era to the knowledge era, it was clear that knowledge had become the fundamental force behind the success of organizations and knowledge is the unique mean that has to be managed.

To achieve effective knowledge management in an organization, a clear understanding of knowledge management is required. There are many definitions of knowledge management as they are the reflections of researchers' insights.

IV. DEFINITION OF KNOWLEDGE MANAGEMENT

Following are some definition of "knowledge management". Probst (1999), state that "The goal of knowledge management is a practical one: to improve organizational capabilities through better use of the organization's individual and collective knowledge resources.

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These resources include skills, capabilities, experience, routines, and norms, as well as technologies" [8].

Knowledge management is "A conscious strategy of getting the right knowledge to the right people at the right time, and helping people share and put information into action in ways that strive to improve organizational performance".

Knowledge management is "The explicit and systematic management of vital knowledge and its associated processes of creating, gathering, organizing, diffusion, use and exploitation. It requires turning personal knowledge into corporate knowledge that can be widely shared throughout an organization and appropriately applied"[5].

Knowledge management is, "The systematic and deliberate creations, building, renewal, application and leveraging of knowledge and other intellectual capital assets to maximize the individual's and the enterprise's knowledge-related effectiveness and returns" [9].

Dalkir (2005) mentioned that a good definition of knowledge management incorporates both the capturing and storing of knowledge perspectives, together with the valuing of intellectual assets. Knowledge management is the deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through reuse and information [10].

One of the useful and practical definitions has provided by Probst, Raub and Romhardt in (1997). In this definition, knowledge management contains of six major factors which are: knowledge identification, knowledge acquisition, knowledge development, knowledge distribution, knowledge preservation and knowledge use. They also introduced a model and called it "Building Blocks of Knowledge Management" (Figure 1). This model has proved its usefulness in many kinds of organizations [11].
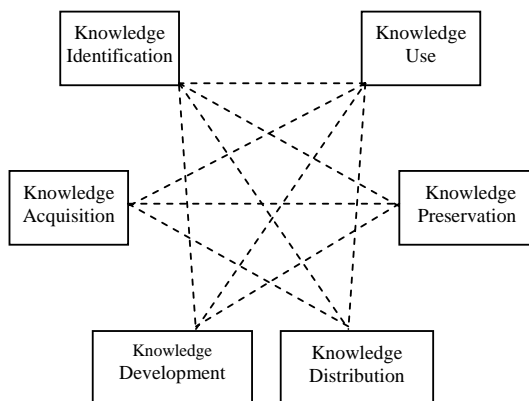

Fig. 1 The building blocks of knowledge management

V. KNOWLEDGE MANAGEMENT FACTORS

A. Knowledge Identification

One of the major aspects of knowledge management studies is knowledge identification. Through the identification of the employee's knowledge, managers can recognize the weakness of them and try to adjust the employee's knowledge and abilities with require knowledge in their organizations [12].

Companies and organizations should know what the level of knowledge and skill is inside and outside their organizations, before deeply investing in the development of new capabilities [8].

B. Knowledge Acquisition

Organizations need to buy critical capabilities, frequently from many knowledge markets, using focused acquisition strategies. Probst (1999) differentiate four "import channels": Knowledge Held by Other Firms, Stakeholder Knowledge, Experts, and Knowledge Products [8].

C. Knowledge Development

All the management performance planned to make new internal or external knowledge on both the individual and the group level, will form the knowledge management development [8].

D. Knowledge Distribution

Knowledge distribution is a way of transmitting knowledge to co-workers and other individuals in organization [13].

Before the knowledge can be exploited at the organization levels, it has to be distributed and shared during the organization [14].

E. Knowledge preservation

After acquiring developing knowledge, you must preserve it. If organizations do not want to lose their corporate memory or valuable expertise, they must form the selecting valuable knowledge process for suitable storage and preservation [8].

F. Knowledge Use

Organizational knowledge needs to be used into a company's products, processes, and services. If an organization wants to sustain its competitive advantage, it has to place the right kind of knowledge in the right form [14].

Generally, Knowledge use means "the productive deployment of organizational knowledge in the production process". In fact it is the purpose of knowledge management [8].

VI. STUDY HYPOTHESES

The main hypothesis of this research is:" There is appropriate context to application of knowledge management factors in medical college of Esfahan university"

1) There is appropriate context to application of knowledge identification in medical college of Esfahan university.
2) There is appropriate context to application of knowledge Acquisition in medical college of Esfahan university.
3) There is appropriate context to application of knowledge development in medical college of Esfahan university.
4) There is appropriate context to application of knowledge distribution in medical college of Esfahan university.
5) There is appropriate context to application of knowledge Preservation in medical college of Esfahan university.
6) There is appropriate context to application of knowledge use in medical college of Esfahan university.

VII. METHODOLOGY

This study was divided to two parts. In the first part researchers tested the hypotheses to find that "is there appropriate context to application of knowledge management factors in medical college of Esfahan university". Because of the nature and goals of this part of the study, descriptive method survey was used. It utilized the quantitative research methodology. Consequently, a set of questionnaires were developed. The population of this study are the faculty members in medical college, containing 614 participants and also the staff of EUMC who have associate degree and upper, containing 652 participants. As a result the total populations of current research are 1266.

With using the 38 initial questionnaires and also via the bellow formula (estimated 95% certainty level) the sample size of study was estimated as 295 people.

$$n = \frac{Nt^2pq}{(N-1)d^2 + t^2pq}$$

Random sampling helped us to select individuals to participate in the study. 267 questionnaires returned back from 295 participants. The member group of this study consisted of both males and females.

In the second part, based on the quantitative result, researchers did an interview with 10 faculty members. Then based on this qualitative research, researchers proposed the guide line to create the appropriate context for the application of knowledge management factors.

VIII. RESEARCH FINDINGS

To reach the result in first part of the study, at first the main hypothesis was tested and then testing the sub-hypotheses was conducted.

TABLE I
COMPARISON OF SCORE OF THE APPLICATION OF KNOWLEDGE MANAGEMENT FACTORS WITH THE HYPOTHETICAL MEAN OF 3, AS FACULTY MEMBERS AND STAFF OF ESFAHAN UNIVERSITY MEDICAL COLLEGE.

	$\overline{X}$	S	Se	t	Df
Knowledge management Factors	24	0.535	0.032	-13.97	267

Table I, shows that, the observed *t* in all dimensions is smaller than the critical value of the table at an error level of 0.05. Therefore, the rate of the application of knowledge management factors in Esfahan University Medical College have been lower than average.

TABLE II
COMPARISON OF MEAN SCORE OF THE APPLICATION OF KNOWLEDGE FACTORS WITH THE HYPOTHETICAL MEAN OF 3, AS FACULTY MEMBERS AND STAFF OF ESFAHAN UNIVERSITY MEDICAL COLLEGE.

Knowledge Factors	$\overline{X}$	S	Se	t	Df
Knowledge Identification	2.59	0.613	0.037	-10.77	267
Knowledge Acquisition	2.42	0.635	0.038	-14.71	267
Knowledge Development	2.61	0.599	0.0366	-10.61	267
Knowledge Distribution	2.54	0.637	0.038	-14.12	267
Knowledge Preservation	2.59	0.602	0.068	-10.87	267
Knowledge Use	2.57	0.608	0.037	-11.53	267

Findings of Table II show that, the observed 't' in all dimensions is smaller than the critical value of the table at an error level of 0.05. Therefore, the rate of application of knowledge identification, knowledge acquisition, knowledge development, knowledge distribution, knowledge preservation and knowledge use, in view of faculty members and staff of Esfahan University Medical College, have been lower than average.

TABLE III
COMPARISON OF MEAN SCORE OF THE APPLICATION OF KNOWLEDGE MANAGEMENT FACTORS AS FACULTY MEMBERS AND STAFF OPINIONS

Knowledge Factors	Faculty members		staff		t	P
	$\overline{X}$	S	$\overline{X}$	S		
Knowledge Identification	2.56	0.583	2.63	0.644	0.932	0.352
Knowledge Acquisition	2.40	0.603	2.45	0.699	0.636	0.526
Knowledge Development	2.62	0.569	2.58	0.632	0.541	0.589
Knowledge Distribution	2.33	0.649	2.57	0.603	3.08	0.002
Knowledge Preservation	2.58	0.582	2.61	0.626	0.479	0.632
Knowledge Use	2.57	0.607	2.56	0.612	0.141	0.888

According to Table III, a comparison of the scores of faculty members' opinions and staff in relation to the knowledge management in terms of knowledge distribution was significant in relation to t at the level of $p \leq 0.05$. Therefore, there is a difference of opinion among the faculty members and staff in terms of knowledge distribution. The knowledge distribution in opinion of the staff with bachelor and assistance degree is lower that PhD degree (see table IV).

However, about other factors as Table III shows, was not significant in relation to the observed t at the level of $P \leq 0.05$. Therefore, there is no difference of opinion among the faculty members and staff in terms of knowledge identification, knowledge acquisition, knowledge development, knowledge preservation and knowledge use.

TABLE IV
COMPARISON OF PAIRED MEAN KNOWLEDGE DISTRIBUTION AS
STAFF OPINIONS IN TERM OF THEIR EDUCATIONAL DEGREE

	Mean Difference	Level of Significance
Associate degree and PhD degree	-0.558	0.007
Bachelor degree and PhD degree	-0.402	0.029

IX. CONCLUSION AND GUIDELINE

Analysis of data and information of this study shows that rate of the application of knowledge management factors in Esfahan University Medical College has been lower than average. Also comparing mean score of the application of knowledge management factors shows that there is not an equal application of knowledge management factors. That's because knowledge development has the highest and knowledge acquisition has the lowest application. However, the rate of application of all knowledge management factors including knowledge identification, knowledge acquisition, knowledge development, knowledge distribution, knowledge preservation and knowledge use, as per faculty members and staff of Esfahan University Medical College, has been lower than average. Also comparing people with different educational degrees shows they all agree with the rate of application of all knowledge management factors except for knowledge distribution.

As a result, application of knowledge management in Esfahan University Medical College is lower than normal. Therefore, for establishing a knowledge management system, it is necessary to create a technical, human and scientific context to support the knowledge identification, knowledge acquisition, knowledge development, knowledge distribution, knowledge preservation and knowledge use.

In this regard, researchers did an interview with ten faculty members. As a result, following guideline was proposed to establish further applications of knowledge management systems in Esfahan University Medical College;

1) Try to make the employee recruitment tests more efficiently to be able to select more professional people.
2) Try to make the employee recruitment tests more efficiently to be able to select more professional people.
3) Use the knowledge of experienced people at work
4) Prepare the opportunities for experts to exchange their information like having more efficient meetings
5) Record successful and unsuccessful experiences, more efforts to eliminate defects of past programs and these experiences for the future programs.
6) Use new methods to encourage the personnel to persuade them to store and distribute useful organizational knowledge.
7) Emphasize the importance of learning practical computer skills to avoid traditional staff training.
8) Establish required training courses for staff to improve their knowledge through using new techniques.
9) Provide some facilities to have easy access to scientific and technical knowledge used in other universities via the internet for all employees.
10) Promote research and development (R&D) centers and communicate with other universities' R&D centers.
11) Promote personnel records information systems to identify the key knowledge holders.
12) Use different methods to store and record the knowledge of experienced employees.
13) Establish an efficient and proper system of performance assessment for the faculty members and staff to identify the talented people and promote scientific levels of employees.

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