

Measuring and explaining the underlying factors for implementing knowledge management in Research and Development Centers. Case Study: Research Institute of Petroleum Industry (RIPI)

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Abstract

Research hypothesis of the present study entitled "Measuring and explaining the underlying factors for implementing knowledge management in Research and Development Centers ", have been developed based on the underlying principles of knowledge management, including; processes of knowledge, information technology and organizational culture. The population of the study consists of all packaging professionals and company executives, with the total number of 150 people. Based on Morgan sampling method, the sample size of the study was calculated to be 108 people. The research method is a descriptive–survey one, and a questionnaire was used to collect the data. The validity of the questionnaire was confirmed, and the Cronbach's alpha coefficient of 0.968 of the questionnaire, showed that it is reliable. Regarding the samples, the questionnaires were distributed randomly among individuals. After collecting the data, a binomial

distribution test was used to test the research hypothesis. Binomial test results showed that organizational culture, from among the underlying principles of knowledge management, is in appropriate status for implementing knowledge management in Research and Development Centers. But the other two factors, i.e. information technology and the processes of knowledge, are not in appropriate status for implementing knowledge management in Research and Development Centers. The answers of the questions of the study indicated that the status of the underlying principles of knowledge management in Research and Development Centers are not appropriate.

Key Words: knowledge management; processes of knowledge; information technology; and organizational culture

Introduction:

Today, knowledge is an integral part of the success of organizations. This issue is of a vital importance to those organizations in which intellectual capital and intangible assets are very important. If the procedures of changes and developments of knowledge in today's society are viewed carefully, the important conclusion drawn will be the fact that today's post-industrial society is an information society, where amplifier technologies are gradually giving their way to knowledge increasing technologies.

In today's complex and dynamic environment, it is essential for manufacturing organizations to continuously create new knowledge, validate it, and apply it in their products and services. In this regard, Peter Drucker states that the secret to success in the 21st century is only the knowledge management. Therefore, knowledge management is an issue that is more important than knowledge itself, and seeks to explain and clarify how individual and organizational information and knowledge are transformed to group knowledge and skills in an organization.

Hence, the organizations should create an excellent medium for sharing and transferring knowledge, and interactions among its members. They should train the staffs to conceptualize their interactions, and they should try to identify and prepare the underlying factors for implementing knowledge management as well. There is a

problem and a challenge here, and that is the fact that knowledge management is a systematic issue, whose successful implementation requires a comprehensive view of all organizational factors.

On the other hand, since numerous models and methods have been proposed for applying knowledge management in organizations, managers looking for implementing knowledge management in their organization, get confused. In this regard, many organizations have made attempts to expand their investments on information and communication technologies.

But it should be noted that the successful implementation of knowledge management in an organization requires the different organizational factors, such as organizational structure, organizational culture, technology and human resources to have specific characteristics, and to possess the needed coherence and coordination. The existence of gaps and inconsistencies among these factors will hinder the successful implementation of knowledge management. Thus, for successful implementation of knowledge management, one should; consider the organization as a whole, take all these factors into consideration, and identify and analyze their status in the organization as well.

In comparison to other research organizations, for RIPI, which is responsible for the research based on the objectives of the oil industry, this need is more critical, and the organization requires a more and higher level of knowledge. Since the researcher has been involved in this field for many years, and is familiar with the organization, and has had various responsibilities in the organization, including staff education and Graduates' department, in his opinion, the higher and more knowledge and sharing between staff in the oil industry, the higher and more its competitiveness will be. And this will provide more revenue for the country, and will lead to more development and greater prosperity for the society. Hence, the researcher's mind was challenged to try to take this concern and propose practical solutions within his capabilities.

Research literature:

1- Knowledge management

In Schein's point of view knowledge management process is the one which makes it possible for the organization to create, validate, and apply new knowledge in its products and services. And thus by enabling to have a "smarter performance", helps the organization improve a range of organizational features. (Schein, 2001, p. 5)

2- Organizational Culture

Robbins, 1996 in his management book defines organizational culture in this way: organizational culture specifies how to run the affairs within the organization for the staff. And it is an even perception of the organization that is observed in all organization members, and represents those common and constant specifications which distinguish the organization from other organizations. In other words, organizational culture specifies social identity of each organization. (Robbins, 1996, p. 56)

3- Processes of Knowledge

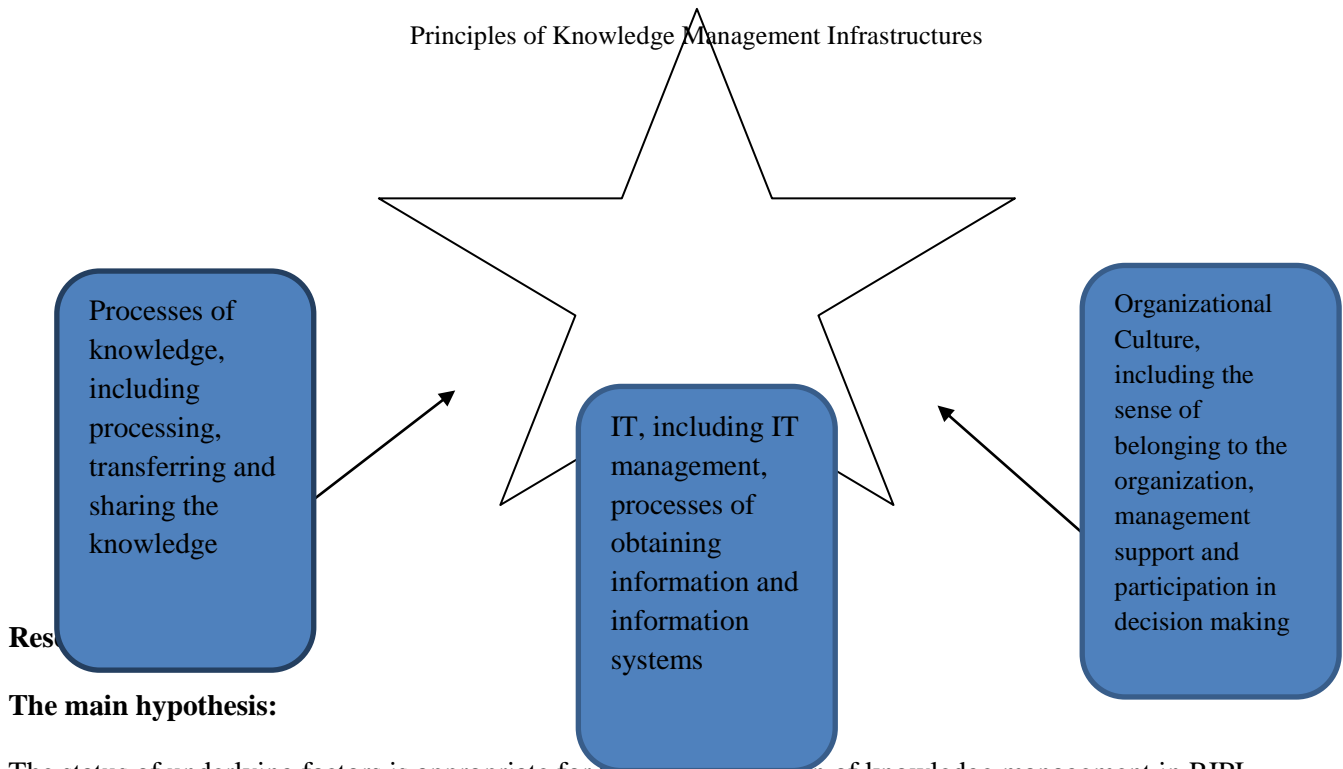
By the term "processes in knowledge management", we mean collection and organization of knowledge, and the exploitation and protection of knowledge assets.

4. IT system

The latest definition of IT which a large number of scholars such as Andolsen (1999), Campbell (1999), Edwards (1999), Graham (1999), Schober (1999), Wildstrom (1999) and etc. agree on has been stated as such: "IT encompasses a wide range of inventions and media communication which links information systems and people to each other, such as voice mail, e-mail, audio conferencing, video conferencing, Internet, software, hardware and the like. Information systems and information technologies are often intertwined and usually, together they are called "information technologies". (Tsang, 2002, p. 837)

Conceptual model of the study

The theoretical framework of the research has been derived from a study conducted in 2000 by Sivan (Figure 1-1). As it can be seen in the diagram, the principles of knowledge management infrastructure, consist of processes of knowledge; information technology; and organizational culture. A strong knowledge infrastructure is created based on strong principles, and these principles are used to make full use of knowledge.



The main hypothesis:

The status of underlying factors is appropriate for the implementation of knowledge management in RIPI.

Secondary Hypotheses:

1. The status of information technology system is appropriate for the implementation of knowledge management in RIPI.
- 2- The status of processes of knowledge is appropriate for the implementation of knowledge management in RIPI.
- 3- The status of organizational culture is appropriate for the implementation of knowledge management in RIPI.

Research Methodology:

The present study, in terms of the objectives, is an applied one. The main method of the study in terms of the nature of the research topics, and population is a survey one, which is considered as the most common method of research in the social sciences .In general, in terms of the method, this study is a descriptive survey. In this study, statistical population consists of senior, executive and middle class managers and the managers of the centers which are defined based on authorities. The selection method of these managers is defined on the basis of approved structure of research managers, and this selection is carried out in accordance with formal responsibility, including campus deans, heads of departments and research groups, and project managers, who are nearly 150 people. Morgan table was used to determine the sample size of this study. And based on this table, the sample size was calculated to be 108 people. We used simple random sampling method to obtain the sample. Field survey was used to collect the data. This means that managers and staff were consulted by questionnaire.

To assess its reliability, the questionnaire was administered to 30 people of the population, and then using SPSS software, its Cronbach's alpha coefficient was calculated which was equal to 0.968, since this figure is higher than 0.7, the reliability of questionnaire is confirmed. To assess the validity, content validity was used. For this purpose, after consultation with professors and advisors, as well as a number of experts in management field, it became clear that the questionnaire possess the needed validity.

Data analysis:
The first hypothesis test

H_0 : The status of information technology system is not appropriate for the implementation of knowledge management in RIPI.

H_1 : The status of information technology system is appropriate for the implementation of knowledge management in RIPI.

factor	classification	Number	Percent	Test ratio	Level of significance	Test result
information technology system	<3	56	0/5	0.60	0.052	H_0 is confirmed
	>3	52	0.5			
		108	1.00			

Based on the results and observations shown in the table, and since the level of significance is larger than 0.05, so one can claim that H_0 is confirmed.

The second hypothesis test

H_0 : The status of the processes of knowledge is not appropriate for the implementation of knowledge management in RIPI.

H_1 : The status of the processes of knowledge is appropriate for the implementation of knowledge management in RIPI.

factor	classification	Number	Percent	Test ratio	Level of significance	Test result
the processes of knowledge	<3	69	0/6	0.60	0.235	H_0 is confirmed
	>3	39	0.4			
		108	1.00			

Based on the results and observations shown in the table, and since the level of significance is larger than 0.05, so one can claim that H_0 is confirmed.

The third hypothesis testing

H_0 : The status of the organizational culture is not appropriate for the implementation of knowledge management in RIPI.

H_1 : The status of the organizational culture is appropriate for the implementation of knowledge management in RIPI.

factor	classification	Number	Percent	Test ratio	Level of significance	Test result
the organizational culture	<3	47	0/6	0.60	0.001	H_1 is confirmed
	>3	61	0.4			
		108	1.00			

Based on the results and observations shown in the table, and since the level of significance is smaller than 0.05, so one can claim that H_0 is rejected and H_1 is confirmed.

The main hypothesis testing

H_0 : The status of underlying factors is not appropriate for the implementation of knowledge management in RIPI.

H_1 : The status of underlying factors is appropriate for the implementation of knowledge management in RIPI.

factor	classification	Number	Percent	Test ratio	Level of significance	Test result
the processes of knowledge	<3	54	0/5	0.60	0.118	H_0 is confirmed
	>3	54	0.5			
		108	1.00			

Based on the results and observations shown in the table, and since the level of significance is larger than 0.05, so one can claim that H_0 is confirmed.

Discussion and conclusion:

The research questions are as follows:

The main question:

How appropriate is the status of the underlying factors for implementing knowledge management in RIPI?

The secondary questions:

1. How appropriate is the status of information technology system for implementing knowledge management in RIPI?
- 2- How appropriate is the status of processes of knowledge for implementing knowledge management in RIPI?
- 3- How appropriate is the status of organizational culture for implementing knowledge management in RIPI?

The conclusion of testing the first question

In this section we seek to answer the question that how appropriate the status of information technology system is for implementing knowledge management in RIPI. H_0 was; the status of information technology system is not appropriate for the implementation of knowledge management in RIPI, and the H_1 was; the status of information technology system is appropriate for the implementation of knowledge management in RIPI. Binomial test results show that the null hypothesis is confirmed. Therefore it can be concluded that the status of information technology system is not appropriate for the implementation of knowledge management in RIPI.

The conclusion of testing the second question

In this section we seek to answer the question that how appropriate the status of processes of knowledge is for implementing knowledge management in RIPI. H_0 was; the status of processes of knowledge is not appropriate for the implementation of knowledge management in RIPI, and the H_1 was; the status of processes of knowledge is appropriate for the implementation of knowledge management in RIPI. Binomial test results show that the null hypothesis is confirmed. Therefore it can be concluded that the status of processes of knowledge is not appropriate for the implementation of knowledge management in RIPI.

The conclusion of testing the third question

In this section we seek to answer the question that how appropriate the status of organizational culture is for implementing knowledge management in RIPI. H_0 was; the status of organizational culture is not appropriate for the implementation of knowledge management in RIPI, and the H_1 was; the status of organizational culture is appropriate for the implementation of knowledge management in RIPI. Binomial test results show that H_1 is confirmed. Therefore it can be concluded that the status of organizational culture is appropriate for the implementation of knowledge management in RIPI.

The conclusion of testing the main question

In this section we try to answer the question that how appropriate the status of the underlying factors of knowledge management is for implementing knowledge management in RIPI. H_0 was; the status of the

underlying factors of knowledge management is not appropriate for the implementation of knowledge management in RIPI, and the H_1 was; the status of the underlying factors of knowledge management is appropriate for the implementation of knowledge management in RIPI.

Binomial test results show that the null hypothesis is confirmed. Therefore it can be concluded that the status of the underlying factors of knowledge management is not appropriate for the implementation of knowledge management in RIPI.

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