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A study on factors influencing implementation of knowledge management

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A B S T R A C T

Replacement in organization's employees can results in knowledge loss and turnover faces a serious problem in knowledge based organizations such as knowledge based sectors of governmental organizations. The increases in sizes of some governmental organizations in recent years have increased their structural and contextual dimensions. One of the biggest problems in governmental organizations is employee turnover, which could result to knowledge loss. By using knowledge management it is possible to decrease this phenomenon. This survey identifies the effective factors in implementation of knowledge management system as a solution for preventing knowledge loss. By far this study is the first of its kind in the context of information technology sectors of governmental organizations of ARAK Province of Iran.

1. Introduction

Human resources are the primary sources of developing most organizations. When an employee leaves an organization, the firm will may lose some valuable information. Knowledge loss may have some bad consequences such as quality loss in organizations' outputs. A solution for this problem is a system to accumulate and to keep the knowledge (Chosnek, 2010). Keeping of experts has been an important issue in organizations where technology changes very quickly. Organizations not only lose the employees but also the knowledge, which was accumulated during the working years of employees (Scalzo, 2006). Information technology (IT) is a knowledge intensive domain (Chase, 1997) and could be an alternative framework for knowledge storage. Literature review suggests that knowledge management is a solution to reduce the effect of knowledge loss (e.g. see Natarajan & Shekhar, 2001, Tiwana, 2003, McFerrin, 2007, Saunders, 2007). This survey attempts to determine various aspects of knowledge management in IT sectors of governmental organizations of ARAK.

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Problem definition is the first step in the process of systematic problem solving (Smith, 1989). This study links the knowledge loss to an appropriate solution and provides necessary information to obtain successful knowledge management systems. Tiwana (2003) offers an implementation strategy for knowledge management to identify knowledge management gaps in organizations. By literature review, we have found that just few studies are available on identification strategy management gaps in IT sectors. This survey tries to fill this gap. Knowledge management and keeping experts are known as the most valuable asset of organizations globally (Demarest, 1997). Organizations try to find a solution for effective management and coordination of knowledge (Wiig, 1994). Nowadays organizations attempt to create, capture, use, share, and apply organizational knowledge (Zack, 2002). Some researchers believe that the only sustainable thing for an organization to be competitive is its internal knowledge, ability to leverage what it knows and the speed to acquire up-to-date knowledge (Prusak, 1996). Knowledge Management (KM) is a process that captures organization's knowledge in databases, prepares knowledge in people's minds and gives it to needed entities (Hibbard, 1997). This process attempts to get the right knowledge to the right people at the right time so they can make the best decisions (Petrash, 1996).

Implementing KM remains an important problem for organizations and according to Drucker (1993), the father of modern management theory, one of the most important challenges facing organizations in a contemporary society is to build systematic practices for managing knowledge. Therefore, it seems that a good implementation framework to guide organizations before the actual implementation should be developed to ensure the success of the project. Now the question is on how to provide guidelines on an effective KM implementation framework and how to determine the key elements. This paper proposes a set of guidelines for key factors on constructing a KM implementation framework. To accomplish this, the paper defines the implementation framework definition and then goes on to identify and reviews various KM implementation frameworks in systematic approach that have been presented in the literature by classifying them according to the approaches used in their construction.

Table 1
Comparisons of system approach frameworks in KM implementation

Dimensions	Scholars			
	Holsapple & Joshi, 2002	Jarrar, 2002	Gore & Gore, 1999	Wiig et al., 1997
Structure Plan	-	Set strategic priority Define and understand knowledge	Formulate vision	Conceptualize Reflect
Execute	-	-	-	Act Review
Evaluate	-	-	-	-
Knowledge types/resources	Knowledge embedded in participants, culture, infrastructure, artifacts, purpose and strategy	-	Tacit knowledge Explicit knowledge	
KM processes/ activities	Acquire, select, internalize and use knowledge	Collect, present, distribute and measure knowledge	Mainly focuses on knowledge creation and externalization	Develop, distribute, combine and consolidate knowledge
KM influences/factors	Resource influences Managerial influences Environmental influences	Knowledge environment	—	External and internal developments

Based on literature review shown on Table 1 and according to *KM Self Assessment of International Atomic Energy Agency's school of nuclear knowledge management* we have identified some effective factors on knowledge management implementation seems to be influential on successful knowledge management implementation (see Table 2).

Table 2
Effective Factors on KM implementation

Effective Factors	Abstract
Training & Human Performance Improvement	THPI
Methods, Procedures & Documentation	MPD
Technology For KM	TK
Approaches to Capture Knowledge	ACK
Management for KM	MK
Human Resource Planning	HRP
Culture of the Organization	CO

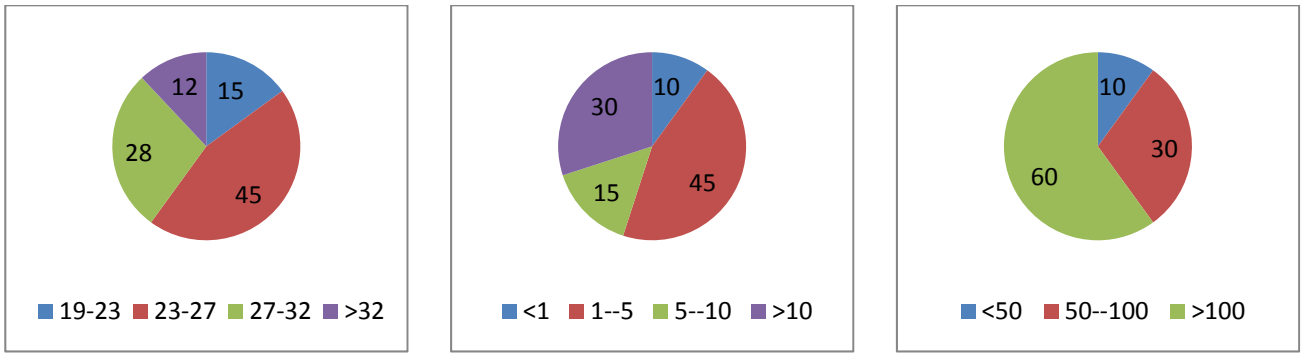
2. Materials and methods

In this paper, an empirical study is performed among experts of governmental organizations to identify the effects of each functional category on knowledge management implementation. The proposed study of this paper considers knowledge management implementation architecture in terms of seven factors according to Fig.2. We have used standard questionnaire with 46 questions based on International Atomic Energy Agency's school of nuclear knowledge management (Kosilov, 2008). The questionnaire is in seven sectors (see Table 4) to measure the strength of a functional category on a five point Likert scale. The population of this survey includes all people who work in IT sectors of governmental organizations in ARAK. The study uses the following to calculate the minimum sample size,

$$n = \frac{N \times z_{a/2}^2 \times p \times q}{\varepsilon^2 \times (N-1) + z_{a/2}^2 \times p \times q}$$

where N is the population size, $p=1-q$ represents the yes/no categories, $z_{a/2}^2$ is CDF of normal distribution and finally ε is the error term. Since we have p=0.5, $z_{a/2} = 1.96$ and N=190, the number of sample size is calculated as n=129. This paper designed a questionnaire in Likert scale, distributed 154 questionnaires among them and eventually collected 130 properly filled ones where most of them hold university educations (see Fig. 1). Seven hypotheses in this survey have been drawn as following:

1. Training & Human Performance Improvement influences positively on knowledge management implementation.
2. Methods, Procedures & Documentation influences positively on knowledge management implementation.
3. Technology for KM influences positively on knowledge management implementation.
4. Approaches to Capture Knowledge influences positively on knowledge management implementation.
5. Management for KM influences positively on knowledge management implementation.
6. Human Resource Planning influences positively on knowledge management implementation.
7. Culture of the Organization influences positively on knowledge management implementation .



Age Years of experiences Number of employees

Fig. 1. Personal characteristics of participants

3. Results

In this section, we present the results of testing seven hypotheses of this survey. Fig. 2 shows the summary of standard values obtained from LISREL software. According to the results given in Table 3, all factors have FL more than 0.4 and by this we can conclude all factors influence on knowledge management implementation. Other statistics of our survey are presented in Table 4. It also confirms that all factors have appropriate goodness of fitness and we can confirm all hypotheses.

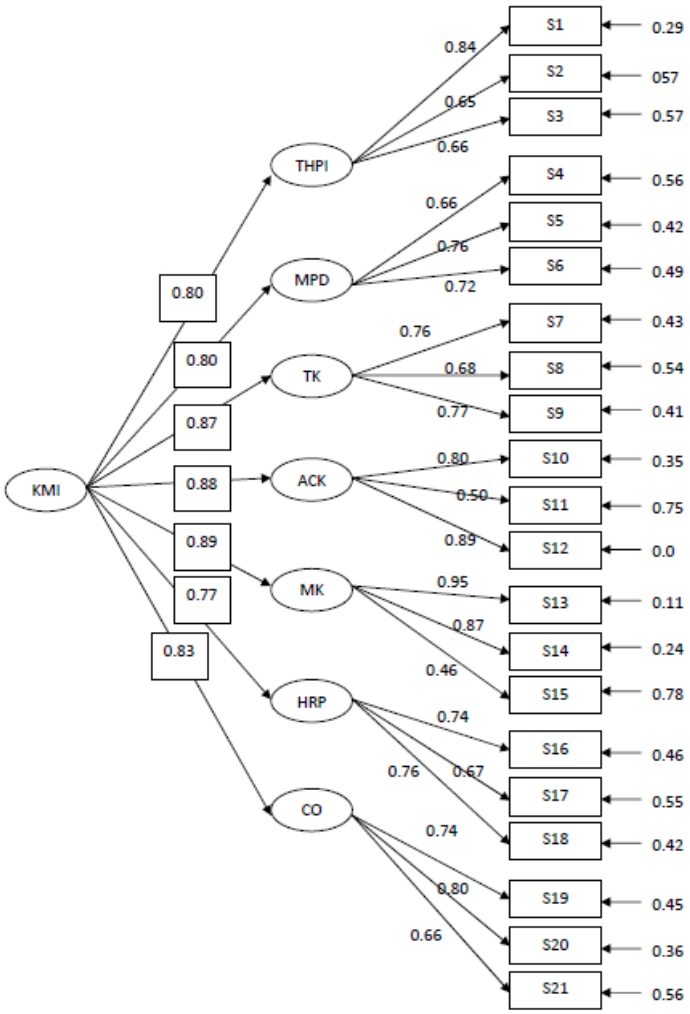


Fig. 2. The summary of standard values

Table 3
The summary of testing various hypotheses of the survey

Components	Sub components	FL	CA	CR	AVE
Training & Human Performance Improvement	Systematic training program for engineers	0.91	0.81	0.83	0.62
	Coaching and mentoring approaches to support knowledge sharing	0.60			
	Trainings provided sufficient knowledge for job performance	0.82			
Methods, Procedures & Documentation	Comprehensive methodology for learning from experience	0.70	0.77	0.77	0.53
	Feedback for operational experiences	0.69			
	Formalized the process of transferring best practices	0.79			
Technology For KM	Portal/internet, knowledge search engines, knowledge databases, etc.	0.85	0.78	0.79	0.56
	Information systems are real time, integrated and smart	0.60			
	Technology is rapidly placed in the hands of employees	0.77			
Approaches to Capture Knowledge	Methods to identify people like elicitation interview	0.62	0.79	0.79	0.56
	Information is managed to facilitate search and retrieval	0.87			
	Processes to leverage captured knowledge	0.74			
Management for KM	Learning from activities for knowledge assets	0.91	0.82	0.83	0.62
	Formal process to transfer best practices	0.76			
	Learning as a strategic focus	0.68			
Human Resource Planning	Comprehensive methodology work force planning	0.84	0.89	0.89	0.72
	Program to develop new leadership/technical talent	0.80			
	Job profiles to assess and monitor its skills and competence needs	0.91			
Culture of the Organization	Culture promote sharing and transfer of knowledge	0.73	0.86	0.87	0.68
	Managers encourages trust, cooperation and collaboration	0.85			
	Failure is seen as an opportunity to learn	0.89			
			0.7	0.7	0.5

FL: Factor load CA: Cronbach Alpha CR: Composite Reliability AR: Average Reliability

Table 4
The summary of survey statistics

Fit index	NFI	NNFI	CFI	GFI	AGFI	P Value	RMSEA	X^2/df
Fitness Value	0.92	0.93	0.94	0.93	0.91	0.09	0.054	1.47
Critical Value	>0.9	>0.9	>0.9	>0.9	>0.8	>0.05	<0.06	<5

NFI: Normed Fit Index NNFI: Non Normed Fit Index CFI: Comparative Fit Index GFI: Goodness of Fit Index
AGFI: Adjustment Goodness of Fit Index RMSEA: Root Mean Square Error of Approximation

4. Discussion and Conclusions

IT sectors of governmental organizations have to use a system for knowledge management to decrease knowledge loss. Based on the results of this survey, it is not easy to conclude that these organizations are using their organization's resources in an efficient manner to implement KM systems. This study showed that management for KM, approaches to capture knowledge, technology for KM have high influence on success of knowledge management implementation. By results of this study it is clear that most of respondents believed that management for KM is the most important factor for implementing knowledge management system in organizations. Therefore, it seems organizations should try to design systematic structures to improve management for KM and factors like human resource planning are not as important as others. As a result for this study we can propose a holistic model according to Fig. 3 for other investigators and practitioners to use as a framework in their studies.

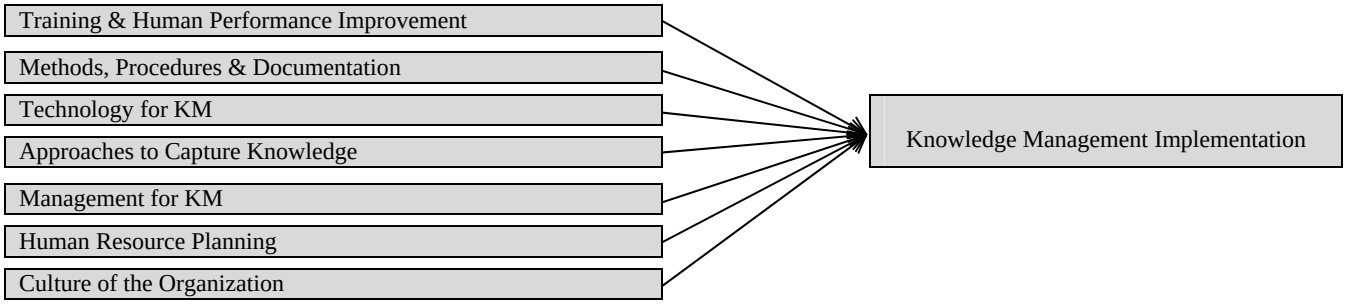


Fig. 3. Knowledge Management Implementation Framework

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