Management Science Letters 2 (2012) 2225–2230

Contents lists available at GrowingScience

Management Science Letters

homepage: www.GrowingScience.com/msl

An empirical study on KM pathology based on life cycle

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A R T I C L E I N F O

Article history:
Received March 15, 2012
Received in Revised form
March, 15, 2012
Accepted 18 May 2012
Available online
May 21 2012

Keywords:
Knowledge management
Economics of idea
Pathology

A B S T R A C T

Nowadays, concerning organizations' needs as well as emphasis from academia, an increasing endeavor from organizations to design and implement knowledge management projects is evident. However, implementation of any project, particularly in preliminary phases, could render some degree of risk and threat. Thus, it is obvious that failure in recognizing and managing those risks could bring about unsuccessfulness within an organization. In this paper, we have presented an empirical study to find the most important factors influencing knowledge management (KM) implementation in one of industries in Iran. The proposed study designed a questionnaire, distributed among most of the workers, and analyzed the results. The study divided KM implementation in four stages of planning, execution, development and institutional. We have also considered four important factors within each stage. The results indicate that culture was the most important barrier during all four stages. In addition, technology was an important issue during the execution stage while content was important during the development stage.

1. Introduction

Knowledge is considered as a primary source of sustainable competitive advantage and in today's competitive environments, many firms wish to better utilize and manage knowledge for business success. Knowledge management (KM) on the other hand, plays essential role on managing firms. KM implementation has its own advantages but there are many barriers on taking advantages of KM in real-world. During the past few years, there have been tremendous efforts on investigating KM implementation in different contexts. Chong et al. (2010) investigated the impact of organizational demographic variables on successful KM implementation. They reported four organizational demographic variables, namely functional areas, years of KM involvement, KM development stage, and degree of knowledge intensity were moderated against a comprehensive set of KM activities, which comprise of KM preliminary success factors, KM strategies and KM processes, with organizational performance. Their empirical results disclosed that all the four demographic characteristics interacted with the degree of implementation of the KM activities, while three of the

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doi: 10.5267/j.msl.2012.05.023

characteristics, with exception of functional areas, show significant relationships with organizational performance.

Yang (2010) examined the effect of KM strategy on strategic performance in Chinese High Technology companies drawing on the theory of resource-based view. They explained that the MK strategy—performance connection was contingent on both performance-driven strategies, which includes reward system and process innovation and KM-based competencies including R&D from past projects, market intelligence, and intra-organizational knowledge sharing. Their results recommended that both performance-driven strategies and KM-based competencies should be considered in the implementation of KM strategy in Chinese High Technology firms. These results have important applications for researchers investigating the effectiveness of high technology firms' adoption of KM strategies in transitional economies. Pirró et al. (2010) presented a model for implementing distributed ontology-based KM systems (DOKMS). The proposed model concentrated on knowledge management within organizations. It studied the functional requirements to enable Individual Knowledge Workers (IKWs) and distributed communities such as project teams to create, manage and share knowledge with the support of ontologies. Garrido-Moreno and Padilla-Meléndez (2011) explained that customer relationship management (CRM) and KM have become key strategic tools for all companies, more specifically in the current competitive environment. In addition, customer knowledge is a necessary issue for CRM implementation. They reviewed many related studies, which analyze the crucial role played by KM initiatives as determinants of CRM implementations. They also reported high rates of failure when implementing that strategy, so there is still no integrated conceptual model to guide companies to their successful implementation. In an empirical study Garrido-Moreno and Padilla-Meléndez (2011) investigated the relationships between KM and CRM success using a structural equation model. They reported that having KM capabilities was not sufficient for the success of CRM, but there were other factors to consider.

Xu and Quaddus (2012) studied the factors impacting the adoption and diffusion of KM systems in Western Australia. They used a mixed methodology approach and the research was performed in three stages including field study, pilot survey, and state survey using the information of 300 firms. Their results indicated that "individual factors", "external inspiring", "organizational factors" and "task complexity" were the most important factors which impact the "perceived usefulness" of KM systems, which in turn substantially impacts the "intention" to adopt KM systems and the diffusion process. Crawford (2005) performed an empirical investigation to explore the relationship between transformational leadership, organizational position, and knowledge management. The results revealed that knowledge management behaviors were significantly forecasted by transformational leadership accounting. Organizational position was an important predictor of knowledge management. Crawford explained that transformational leaders could be used to handle even the most technical characteristics of the modern workplace. Gao et al. (2001) examined knowledge-related issues from the viewpoint of systems science. They proposed a new systematic perspective on knowledge using critical systems thinking, soft systems thinking etc., in order to provide a new way of thinking and a useful toolbox on various levels and phases of knowledge management for practical knowledge users. Bhatt (2000) investigated some of the strategies, which could be matched to increase the effectiveness of the knowledge development cycle. In manufacturing and operational works, the effectiveness of various organizing strategies to enhance the quality of manufacturing processes and products was built. Bhatt (2000) explained that unlike manufacturing and operational processes, knowledge development processes behave chaotically, resulting in intangible products. Therefore, the principles of manufacturing strategies cannot be implemented in the knowledge development cycle. In knowledge works, organizing strategies can be defined and initiated based on knowledge development phases such as knowledge adoption, knowledge distribution, knowledge creation, and knowledge review and revision. Each phase, in the knowledge development cycle, must be evaluated in context of its characteristics on repetition, standardization, reliability, and

specifications. The most important barriers on having knowledge management (KM) can be classified into five groups of human, organizational, cultural, political and political factors.

1. Human factors: This is one of the major barriers on KM since many people prefer not to share their knowledge and they use it solely to improve their own. They may mistakenly assume that knowledge is a power and they should not lose this power.
2. Organizational factors: This is also more important issues, which can be looked into in five different perspectives.

    2.1 Structural factors: When there hierarchical and inflexible organization structure, it is not possible to build a good communication among people.
    2.2 Management factors: When there is not a good support on behalf of management team, it is not possible to execute good KM programs (Manasco, 1999).
    2.3 Job related factors: When there are many components of job become routine and boring, KM loses its role to contribute to organization (Wiig, 2000).
    2.4 Payment systems: When there is a good motivation among workers with good payment system, we may expect a better knowledge sharing (Raadschelders, 1996).
    2.5 Educational systems: A good training system could contribute to organization, significantly (Mc Dermott & O'Dell, 2001).
3. Cultural factors: It is practically impossible to share knowledge without a good culture among workers. In many societies, the common culture is that knowledge is power and people do not have to share it with others. In such societies we should advertise that knowledge sharing is actually power and the people who share their knowledge have better chance of receiving more respect from others do.
4. Political factors: This is more relevant in governmental agencies where members of a political party are unwilling to share their knowledge with members of other political parties (Alavi & Linder, 2000).
5. Technical factors: When there is a good usage of advances in technology, there is also a better chance of KM development (O'dell & Grayson, 1998).

1.1 Analyzing the reasons KM default based on lifecycle

There are literally different reasons for KM default in different stages of planning, execution, development and institutional. These dangers include technology, culture, content and project management. According to Lam and Chau (2005) we can summarize them in Table 1.

Table 1
The summary of the reasons for KM default

Danger	Planning	Execution	Development	Institutional
Technology	Technology unawareness	High complexity	Poor management tools	Insufficient knowledge management requirements
Culture	Technology persistent	Organizational incompatibility	Information sharing prevention	Lack of a good perception on knowledge management
Content	Unclear definition	Weak organizational content	Lack of update system	Lack of knowledge
Project management	Lack of experience	Conflict of interest	Random development	Lack of performance measurement

The first danger is associated with technology and during four stages of planning, execution, development and institutional, we see dangers of technology unawareness, high complexity, poor management tools and insufficient knowledge management requirements, respectively. The second danger come from culture and technology persistent, organizational incompatibility, information sharing prevention and lack of a good perception on KM are four important factors associated with

four stages of planning, execution, development and institutional, respectively. The content and project management are other important items, which include various factors as shown in Table 1. In this paper, we study different existing threats against the implementation of KM, which includes different stages of planning, execution, development and institutional.

2. The proposed model

The proposed study of this paper consists of one major hypothesis and four sub hypotheses as follows,

1. KM implementation in an organization in different stages of planning, execution, development and institutional could be jeopardized by technological, cultural, content and project management factors.

1.1. KM implementation in an organization in planning stage could be jeopardized by technological, cultural, content and project management factors.

1.2. KM implementation in an organization in execution stage could be jeopardized by technological, cultural, content and project management factors.

1.3. KM implementation in an organization in development stage could be jeopardized by technological, cultural, content and project management factors.

1.4. KM implementation in an organization in institutional stage could be jeopardized by technological, cultural, content and project management factors.

We have designed a questionnaire and distributed among the people who work for an industry in Iran. We use the following formula to calculate the minimum number of sample size,

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

where N is the population size, $p = 1 - q$ represents the yes/no categories, $z_{\alpha/2}$ is CDF of normal distribution and finally ε is the error term. Since we have $p = 0.5, z_{\alpha/2} = 1.96$ and N=102, the number of sample size is calculated as n=81. Cronbach alpha (Cronbach, 1951) was calculated as 0.886, which is well above the minum acceptable level and confirms the reliability of our survey. For all tests, we consider null hypothesis as ($H_0: \mu \leq 3$) against ($H_1: \mu > 3$). The study first uses Kolmogorov–Smirnov test for normality test and t-student test for hypotheses. Table 3 shows details of our Kolmogorov–Smirnov test

Table 3
The results of Kolmogorov–Smirnov test for normality test

	Level of significance	Error term	Hypothesis	Result
Planning	0.324	0.05	H_0 accepted	Normal
Execution	0.620	0.05	H_0 accepted	Normal
Development	0.720	0.05	H_0 accepted	Normal
Institutional	0.315	0.05	H_0 accepted	Normal

As we can observe from the results of Table 3, we cannot reject the null hypothesis and accept that the data are normally distributed.

3. The results

In this section, we present details of our test for the main and other sub hypothesis.

3.1. KM implementation in planning stage

Table 4 shows details of our survey for the first hypothesis. As we can observe from the results of Table 4, the null hypothesis associated with technology, content and project management are accepted when the level of significance is five percent.

Table 4
The results of t-test for the first hypothesis

	Sub-hypotheses	N	Mean	SD	T	df	Sig	Result
Planning	Technology	102	3,96	.25610	33,511	80	0 ‹000	H_0 accepted
	Culture	102	2,29	.23630	-10,97	80	0 ‹000	H_0 rejected
	Content	102	3,86	.19610	39,2	80	0 ‹005	H_0 accepted
	Project management	102	3,51	.26230	17,38	80	0 ‹006	H_0 accepted

However, the null hypothesis associated with the second item, culture, is rejected leaving us to conclude that during planning stage culture plays an important role on the success of KM implementation. In other words, technology, content and project management are not considered as the main threats of KM implementation in planning stage.

3.2. KM implementation in execution stage

Table 5 shows details of our survey for the second hypothesis. As we can observe from the results of Table 5, the null hypothesis associated with technology, content and project management are accepted when the level of significance is five percent. Nevertheless, the null hypothesis associated with the second item, culture, is rejected leaving us to conclude that during execution stage culture is important issue for the success of KM implementation. In other words, content and project management are not considered as the main threats of KM implementation in planning stage while technology and culture are important factors for the success of KM.

Table 5
The results of t-test for the main hypothesis

	Sub-hypotheses	N	Mean	SD	T	df	Sig	Result
Execution	Technology	102	2,87	.19054	-40,81	80	0.02	H_0 rejected
	Culture	102	2,45	.21121	-19,14	80	0.005	H_0 rejected
	Content	102	3,12	.25054	4,28	80	0.00	H_0 accepted
	Project management	102	3,25	.29226	7.64	80	0.005	H_0 accepted

2.3. KM implementation in development stage

Table 6 shows details of our survey for the third hypothesis. Again, based on the results of Table 5, the null hypothesis associated with technology and project management are accepted when the level of significance is five percent. Nevertheless, the null hypothesis associated with the first and the second item, technology and culture, is rejected leaving us to conclude that in development stage these two items play essential role for the success of KM implementation. In other words, content and project management are not considered as the main threats of KM implementation in planning stage.

Table 6
The results of t-test for the third hypothesis

	Sub-hypotheses	N	Mean	SD	T	df	Sig	Result
Development	Technology	102	3.34	.21133	14,38	80	0 ‹003	H_0 accepted
	Culture	102	2,15	.26425	-5,07	80	0 ‹005	H_0 rejected
	Content	102	2,76	.29133	-23,32	80	0 ‹000	H_0 rejected
	Project management	102	3,24	.14425	14,87	80	0 ‹002	H_0 accepted

Table 7
The results of t-test for the fourth hypothesis

	Sub-hypotheses	N	Mean	SD	T	df	Sig	Result
Institutional	Technology	102	3,90	.19878	40,47	80	0 ‹001	H_0 accepted
	Culture	102	2,47	.22399	-18,75	80	0 ‹005	H_0 rejected
	Content	102	3,85	.18578	40,90	80	0 ‹003	H_0 accepted
	Project management	102	3.65	.26399	22,01	80	0 ‹005	H_0 accepted

The results of Table 6 shows that culture and content are the most important issue in developing stages, leaving us to conclude that technology and project management do not play important role in this stage when the level of significance is only five percent. The results of Table 7 shows emphasizes one more time that culture is the most important issue for KM development even during the institutional stage while technology content and project management are not important.

4. Conclusion

In this paper, we have presented an empirical study to find the most important factors influencing KM implementation in one of industries in Iran. The proposed study designed a questionnaire, distributed among most of the workers, and analyzed the results. The study divided KM implementation in four stages of planning, execution, development and institutional. We have also considered four important factors within each stage. The results indicate that culture was the most important barrier during all four stages. In addition, technology was an important issue during the execution stage while content was important during the development stage.

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