

Investigation of Implementation of LNG Knowledge Management Model in Order to Achieve a License in National Iranian Gas Export Company

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ABSTRACT

In an era in which competitive advantage is an important necessity, knowledge management (KM) is an effective and efficient tool. There are two approaches in knowledge management field. In the first approach, researchers investigated the key factors influence on KM. in the second approach, researchers provide applied models of KM. in the present research, the first approach was used because of the strategic and long-term subject of KM in the field of LNG. The present research tries to measure the conditions of each of the KM of key factors in LNG in Iranian national gas Export Company and by means of model and standard questionnaire of Hang and Howang (2005). An open questionnaire was also used to collect data. Population and sample of the research included 60 people of experts, managers who were involved in national Iranian export company. One-sample t test was used to test research hypothesis at $\alpha=5\%$. According to the results, hypotheses related to organizational culture, employees' empowerment and managers' commitment, team work and measurement of performance were weak or inappropriate and were rejected. On the other hand, the hypotheses of knowledge structure factors, employees participation and training were powerful and verified.

KEYWORDS: LNG knowledge management, KM key factors, KM steps and models, liquefaction of natural gas

INTRODUCTION

We live in knowledge era. In this era, intellectual properties of organizations are the most important asset and competitive advantage for many organizations. The most complex issues in organizations are collecting, storing, recovery, search, distribution of knowledge. Peter Drucker believes that many important companies like Hewlett-Packard, IBM, and Zimens found that knowledge management brings success (Drucker, 1999). Information and knowledge and their management are inevitable for organizations conservation (Davenport, 2001, 3-4). Organizations try to reach their goals, but environmental instability and threats postpone achieving goals and slow it. It is important for an organization to have a clear understanding of its knowledge capital and to know that how this capital can contribute to remove environmental challenges. KM duty in organizations is to manage knowledge capitals of each organization (Ponlis and Feerer and Sels, 61, 1998). Downport et al (2008) believes that KM not only attracts business experts but also attracts other humanities and social sciences experts. Alvin Toffler in his book titled "future Shock" focuses on human and the changing environment around human. When the volume and pace of the changes go beyond human physical-psychological capacity, future shock takes place. Toffler believes that human and organizations must confront wisely with changes and direct these changes in a way that these changes lead to equilibrium and order. Knowledge management is therefore an efficient tool for the present and future organizations (Neshat, 24, 2009).

LNG stands for Liquefied Natural gas and refers to natural gas which has been converted into liquid. The most economical method of exporting gas to remote countries is its conversion to liquefied natural gas. Natural gas is cooled until -161 degrees centigrade in atmosphere pressure to form LNG. After condensing gas, its volume is reduced by 1/600 and its transport becomes economical. National Iranian gas Export Company has the mission of achieving LNG license in Iran. Km is an effective tool in this case (Iranian LNG conference site, November 2011).

RESEARCH LITERATURE

Management theoreticians believe that knowledge capital is the most important competitive advantage and success key for new organizations. Knowledge management concerns the most important organizational capital i.e. intellectual capitals. KM brings value for organizations through converting human capitals into intellectual

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assets. KM involves effective and aware leadership in organizations. In KM, conversion of tacit knowledge into explicit knowledge is of great importance. Changes which result in interaction and renewal of knowledge must be encouraged and supported in order to develop knowledge management (Davenport and Grover, 2001, 37).

One of the most complete definitions for KM is:

The process of discovering, achieving, creating, sharing, storing, evaluating and applying appropriate knowledge in appropriate time by appropriate individuals in an organization, which is implemented through linking human resources, IT and communications and establishment of a suitable structure for achieving organizational goals (Afrazeh, 2005: 35).

Key factors of success can be defined as dimensions of an organization whose investigation results will guarantee organizational successful performance in case of being satisfactory. Many studies have been conducted in the field of KM. a wide range of factors affecting KM implementation can be observed in literature review. This can be attributed to two approaches. The first is that KM is an important issue and the second is that the studies have not been enough for the wide range of organizational needs. The previous studies in the field of KM can be divided into two groups: the first group involves studies which try to propose a specific model or pattern to implement KM in organizations. The second group tries to investigate, rank and measure key factors related to successful implementation of KM. in some recent studies, these two approaches have been intertwined.

Akhavan et al (2008) selected 16 factors from among 33 key factors in KM implementation. These include: transactions and communications. Job security, organizational risk-taking atmosphere, HRM, team work, knowledge sharing, systematic approach to KM, KM architectures, technological tools and data base for research, documentation, knowledge stores, performance evaluation, modeling, and executive knowledge managers. Alvani and Shahgholian (2005) in a study titled: "designing a model for evaluation of KM level in Iranian industrial organizations" and compared two main car-producing companies in Iran (Alvani and Shahgholian, 2005: 1-15). Downport et al (1998) conducted a study in the level of 31 KM projects in 24 companies. In this research, 8 main factors were identified which were important in implementation of KM. Wong and Aspinwall (2005) stated 11 factors affecting successful implementation of KM. they included: leadership and leadership support, culture, IT, goals and strategies, evaluation, organizational infrastructure, organizational processes and activities, incentives, resources, teaching, HRM. Reshmen et al (2010) conducted a study on Malaysian and Pakistanian SMEs and concluded that 12 factors were important in KM: top management support, suitable knowledge culture, financial resources, IT infrastructure, relationships between sections, human resource development, appointment of knowledgeable people, KM strategy, incentives of knowledge performance, systematic activities and processes of KM, pivotal values of business and organizational infrastructure. Valmohammadi (2010) also referred to the following items: top management supports, organizational culture, IT platforms, KM strategy, performance evaluation, organizational infrastructures, activities and processes, rewards and incentives, resources limitations, teaching, HRM and modeling. Results of previous studies have been summarized in table 1.

Table 1. Dimensions and key factors of KM from KM experts point of view

row	Researcher	Key factors
1	Matthew (2004)	Culture, strategy, IT system, organizational processes
2	Hong and Howang (2009)	Organizational culture, leadership and executive management commitment, employees' participation, employees' training, employees' empowerment, knowledge structure, performance evaluation, team work
3	Andrias Rij (2005)	Organizational culture, organizational structure and IT
4	Ehsan and rolend (2004)	Organizational culture, organizational structure and IT, individuals, organizational directions and policies
5	Martin et al (2003)	Organizational culture, forming skill and motivation, top management, organizational processes and structure, IT.
6	Berger (2003)	Top management, organizational culture, IT infrastructure, internal and external communications
7	Biksler (2002)	Organizational leadership, technology, teaching and learning
8	Downport and prast, 2002)	Leadership, organizational evaluation criteria, organizational policies, distribution of knowledge, organizational information structure , teaching and education
9	Skiem and omden, 2000)	Prospect, knowledge leadership, knowledge distribution culture, smart learning, technologic infrastructure
10	Houlsapel, (2000)	Culture, management, technology, employees' motivation, external factors
11	Manasko (1999)	Knowledge groups, supervision on knowledge content, technologic and structural supports, improvement of knowledge distribution and creation process
12	Bent and Gabriel (1999)	Organizational structure, organizational culture, organizational size, organizational environment, KM methods
13	Fineral (1999)	Appropriate culture, information distribution, knowledge, teaching and learning
14	Tresler (1998)	Management commitment, motivation for knowledge distribution, culture, technology, teaching
15	Downport and Prosak, 1998)	Technology, knowledge creation, knowledge transfer, knowledge e-storages, teaching, culture and strategy, trust
16	Downport (1998)	Organizational and technical infrastructure, knowledge structure, culture, common language and goals, multiple channels for knowledge transfer, supreme management support and motivation

Research model: Hung and Huang KM key factors model (2005)

In the present research, "Hung and Huang KM key factors model" was used as the main model. This conceptual model contains key factors of KM implementation as independent variables and Km main processes as dependent variable. In figure 1, this conceptual model has been illustrated.

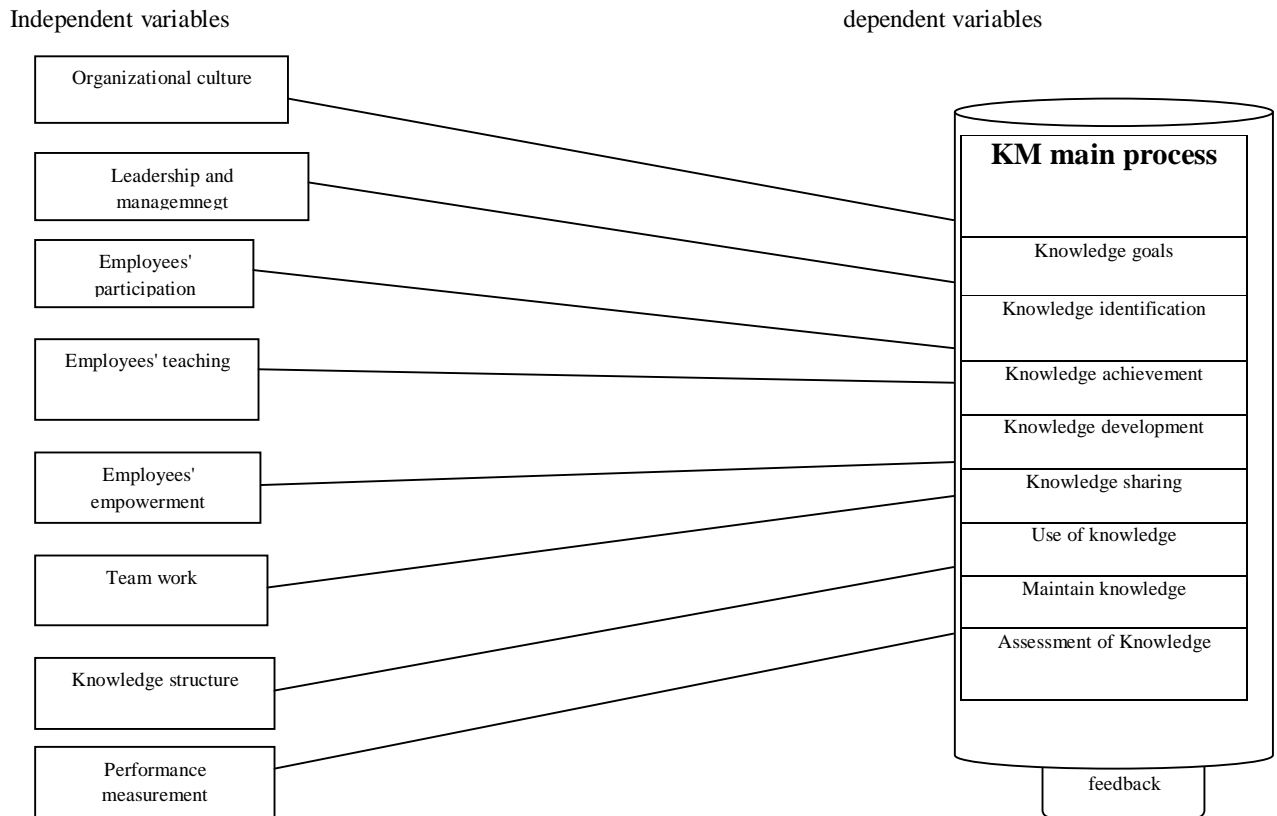


Figure 1. Research conceptual model (Hung and Huang, 2005)

Research hypotheses

H1: the condition of organizational culture has direct influence on the implementation of LNG knowledge management.

H2: the condition of leadership and management commitment has direct influence on the implementation of LNG knowledge management.

H3: the condition of employees' participation has direct influence on the implementation of LNG knowledge management.

H4: the condition of employees' teaching has direct influence on the implementation of LNG knowledge management.

H5: the condition of employees' empowerment has direct influence on the implementation of LNG knowledge management.

H6: the condition of team work has direct influence on the implementation of LNG knowledge management.

H7: the condition of organizational knowledge structure has direct influence on the implementation of LNG knowledge management.

H8: the condition of employees' performance measurement has direct influence on the implementation of LNG knowledge management.

METHODOLOGY

The present research is an applied one, but from data gathering point of view, it is a descriptive (non-experimental) field study. In the present research, Hung and Huang standard questionnaire (2005) was used as the main questionnaire. Population of the present research includes all experts and top managers in LNG industry in national Iranian Gas Export Company (60 people). Because of the limited number of population

members, a census was conducted. An open questionnaire was also used to collect data from LNG industry experts. Opinions of experts of LNG and advisor professors were used for preparing open questionnaire. In the present research, a series of summits were used to plan for LNG knowledge management questionnaire and open questions. Apparent validity of the research is verified because it is a standard questionnaire. However, content validity was also verified by LNG experts. The reliability of the research was calculated by Chronbach's alpha. Alpha was 75.5%, which is a satisfactory value.

RESULTS

Data analysis was conducted by SPSS 21. The normality of data distribution in each of the variables was tested by means of Kolmogrov-Smearov test. Then, t test was used to test hypotheses. Results of t test are summarized in table 2. In LNG knowledge management in Iranian national gas export company, the following factors were weak or unsatisfactory (because sig is greater than $\alpha=0.05$): organizational culture, employees' empowerment, team work, performance measurement, leadership and commitment of top management. The following factors were powerful or satisfactory (because $\text{sig}<\alpha=0.05$): knowledge structure, teaching and employees' participation.

In table 2, the normality of variables distribution by means of Kolmogrov-Smearov test has been shown.

H0: distribution is normal.

H1: distribution is not normal.

Table 2. result of variables distribution normality

variable	Significance level(sig)	Test statistic (KS)	Error probability level(alpha)	Test result
Organizational culture	0.268	1.002	0.05	H0 cannot be rejected (distribution is normal)
Leadership and top management commitment	0.066	0.374	0.05	H0 cannot be rejected (distribution is normal)
Employees' participation	0.105	1.215	0.05	H0 cannot be rejected (distribution is normal)
Employees' teaching	0.220	1.050	0.05	H0 cannot be rejected (distribution is normal)
empowerment	0.072	1.290	0.05	H0 cannot be rejected (distribution is normal)
Team work	0.462	0.852	0.05	H0 cannot be rejected (distribution is normal)
Knowledge structure	0.117	1.191	0.05	H0 cannot be rejected (distribution is normal)
Performance measurement	0.282	0.982	0.05	H0 cannot be rejected (distribution is normal)

Results of research hypotheses test

Table 3 summarizes the results of research hypotheses test which is the output of SPSS statistical software.

Table 3. Summary of the hypotheses test

variable	Significance level(sig)	Error probability level(alpha)	Test statistic (KS)	Degree of freedom (df)	Test results
Organizational culture	0.127	0.05	0.735	59	inappropriate (weakness)
Leadership and management commitment	0.098	0.05	-2.907	59	inappropriate (weakness)
Employees' participation	0.019	0.05	2.405	59	Appropriate(strength)
Employees' training	0.000	0.05	-5.912	59	Appropriate(strength)
Empowerment	0.302	0.05	-1.385	59	inappropriate (weakness)
Team work	0.231	0.05	0.671	59	inappropriate (weakness)
Knowledge structure	0.001	0.05	-3.532	59	Appropriate(strength)
Performance measurement	0.392	0.05	0.862	59	inappropriate (weakness)

It must be mentioned that after testing the 8 hypotheses in this research in the population, 5 hypotheses with independent variables of organizational culture, employees' empowerment, leadership and management commitment, team work and performance measurement were rejected. 3 hypotheses were verified whose independent variables were knowledge structure, teaching and employees' participation. Therefore, the independent variables concerning the verified hypotheses are strength points and the independent variables related to rejected hypotheses are weak points of the national Iranian gas export company in LNG knowledge management. Figure 2 shows the weak points and strengths of LNG knowledge management in national Iranian gas Export Company.

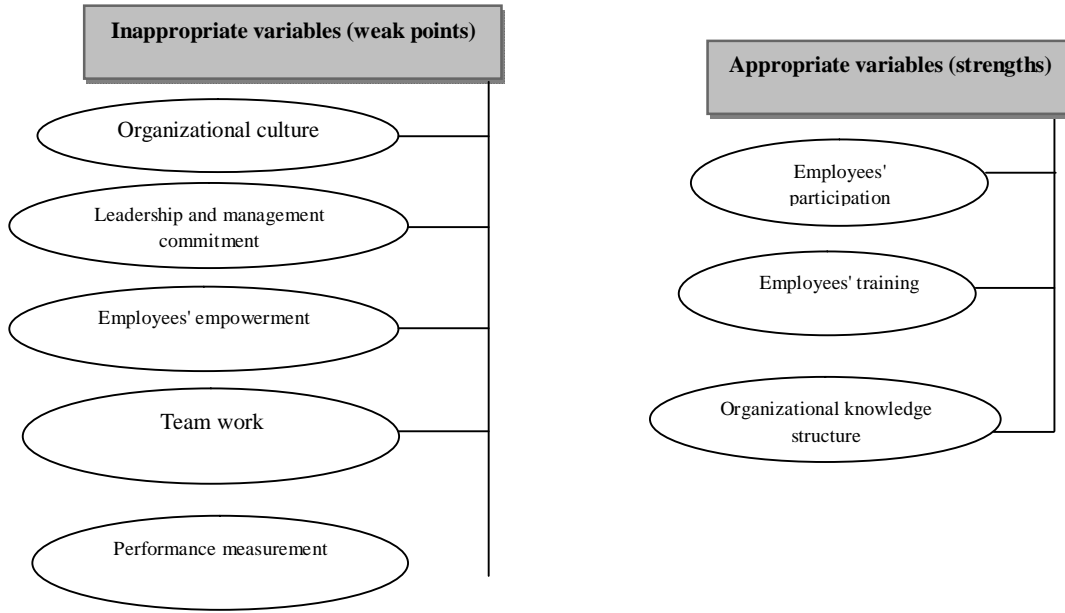


Figure 2. Weak points and strengths of LNG knowledge management in national Iranian gas export company

Recommendations

In the next sentences, some solutions are provided based on the rejected hypotheses (weak points):

a) Concerning the independent variable organizational culture, and considering:

1. Inadequate desire of employees to change
2. Inadequate units and sectors coordination when organizational changes take place
3. Inadequate team work encouragement and knowledge trading, lack of open culture and adequate trust

Recommendations:

- focus of top management on the growth and development of employees' learning
- teaching employees for becoming prepared for change (de-frosting by means of holding educational workshops)
- a comprehensive planning by top management in order to create motivation in employees with applying theories like Herzberg's motivational-Hygienic theory
- encouragement of employees to do team work and promotion of trust quality among employees, employees' trust in organization and their managers

b) concerning the independent variable, employees empowerment and considering:

1. lack of enough organizational commitment for employees' empowerment
2. increase in employees' control while using resources

Recommendations:

- creation of an open organizational environment for employees' comments and giving freedom of action to them
- use of empowerment applied theories like development and job enrichment
- development of employees' skills and increase in self-control morale in them

c) concerning the independent variable leadership and top management commitment considering:

1. inadequate managerial support for KM project and inadequate commitment to doing changes
2. inadequate guidance and strategy for changes by top managers

Recommendations:

- establishment of LNG knowledge management strategy council in supreme managers levels
- financial and spiritual support for employees' knowledge-based activities based on their needs
- more welcoming of employees' participation in knowledge sharing activities
- formulation of LNG knowledge management strategy document

d) concerning the independent variable, performance measurement considering:

1. lack of achieving more reward by skilled individuals with better performance (non-observation of neutrality principle in performance evaluation)
2. inadequate attention to performance evaluation effectiveness and unfair rewarding system within organization
3. indistinct criteria of knowledge-based performance evaluation

Recommendations:

- formulation of fair rewarding directions for Knowledge management
- formulation of KM system and instructions for performance evaluation system in LNG knowledge management and rewarding based on fair criteria
- more managerial attention to neutrality principle observation in performance evaluation
- documentation of experts' experiences, knowledge sharing, chat room
- e) concerning the independent variable team work, considering:
 - 1) inadequate encouragement and support for team work
 - 2) inadequate attention to evaluation of cooperation and team efficiency
 - 3) weakness in establishment of a communication atmosphere between knowledge activities and employees' group work experience
- Recommendations:
 - support for team works and attention to team learning
 - establishment of KM system and formulation of instructions for system of LNG knowledge management performance evaluation
 - establishment of free discussion circumstances for sharing experiences and knowledge through board of experts (cop)

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