

*Full Length Research Paper*

## Designing a domesticated model of knowledge management implementation in Institute of International Energy Studies (IIES)

Hesamoddin Bagheri<sup>1\*</sup>, Elahehsadat Razavi<sup>1</sup>, Iraj Janali<sup>2</sup> and Mohammad Sadegh Aghakhani<sup>3</sup>

<sup>1</sup>34, Kalhor alley, Sheykh Akbari Alley, Fadaian Eslam Street, Shahre rey, Tehran, Iran.

<sup>2</sup>23, Pirooz Street, Tehran, Iran.

<sup>3</sup>20, AHMADI Alley, Shahre rey, Tehran, Iran.

Accepted 21<sup>st</sup> August, 2013

This study has concentrated on presenting and designing domesticated model of knowledge management implementation in Institute of International Energy Studies (IIES). This research on the base of its goal is an applied and developing research, and the research methodology is a quantitative and survey research. Needed information in this study has been gathered from document analysis and semi-directed interview and analyzed by content analysis method; consequently, enterprises for implementing KMS should handle 7 stages process, IIES KM Implementation Model: Project Management, Background and Literature Analysis in the Industry, Awareness around Best Practice in the field of Knowledge Management and its external environment, Formulating strategic KM statement in the pilot section, Formulating KM regulation in the pilot section, Experimental implementation and testing the KM Soft Ware in the pilot section and Education and creation of culture in the pilot section. Generally, utilizing this model in the enterprises strategically will be due to synergy and resources and knowledge capabilities value creation.

**Key words:** Knowledge, knowledge management, knowledge management methodology, knowledge management strategy, IIES.

### INTRODUCTION

Since 1970, because of technology advancement particularly in the field of communication and computer, the model of economic progression in the world changes fundamentally. Consequently, from 1990 organizational knowledge is put in the place of financial and physical investment (Chen et al., 2004). Therefore, nowadays economy is based on such knowledge orientation that cites out Knowledge-Based Economy. For, as Drucker said, "from now on knowledge will be the main economic resource instead of financial investments, natural resources and work force (Drucker, 1995).

Similarly, knowledge and information plays a consi-

derable key role for competing in the dynamic and complicated world economic environment in the direction of sustainable achievement in the enterprises. The main problem is to find how enterprise can use existing skills, experience and knowledge as a strategic resource towards sustainable competitive advantage productively. Knowledge management system has developed in this environment in an attempt to preserve, retrieve, share, transfer and utilize knowledge in the enterprise.

In this area knowledge management systems have developed with the effect on creation, retrieve, preserving, sharing, transferring and practicing the knowledge in an

enterprise. Knowledge management is a strategic and systematic subject, whose successful implementation needs comprehensive insight about enterprise infrastructures. On this, strategic insight via designing and implementing knowledge management in enterprises accompany with basic frameworks such as cultural, technological, political and financial structures according to the knowledge capitals, (human and customer capitals) would be essential. Knowledge management has much more advantages for the enterprises, which are work quality improvement, up to date information accessibility, productivity, and decision-making improvement, prompt response to customers' wants and change possibility and quick adaptability to respond to essential and fundamental needs.

Naturally, knowledge management implementation will be done gradually in each enterprise. Because sudden changes do not solve enterprises' problems, they lose capitals. Generally, different sorts of knowledge management implementation exist, but there are a little more differences in the knowledge management approaches and enterprises diversification and its requirements to implement the knowledge management system. In implementing Knowledge Management System (KMS) different elements such as competitor behavior, plan content flexibility, knowledge and information transformation and fluxibility, implementation methods, global best practices experience and systematic implementation should be considered consequently.

## RESEARCH BACKGROUND

Extended studies have been accomplished in the field of Knowledge Management (KM), especially, after presenting the knowledge society, in 1990, for the model of global economy growth, accompanied with different studies about designing and implementing KM in the enterprises. Its methodology has been utilized toward regularizing this research in oil industry. The following global enterprises have implemented KMS successfully: Microsoft KMS, American Army KMS, NASA Academic Knowledge Sharing (ASK), HP Knowledge Advisor Management (KAS), General Motors (GM) KMS, SIEMENS KMS, SONY KMS, PHILIPS KMS, British Petroleum KMS, Royal Dutch Shell KMS and so on.

## RESEARCH METHODS

This research is an applied and developed one. Moreover, its methodology is quantitative and surveying research; in order to gather information we have analyzed and searched the document and internet valid sites. In this field of study, we have practiced exploratory and semi-directed interview. Besides, content analysis has been utilized for data analysis. Research population

includes NIGC managers and experts who specialize in applied science about KM in Oil Industry.

In this way, after surveying the research background, theoretical literature and completing semi-directed interviews by the professionals, managers and experts, a pilot model were designed for implementing KM, and then criticized by 14 professors and Oil Industry experts on the basis of Delphi Method. In addition, we have arranged a 3-person focus group meeting for validity assessment with the participation of IIES scientific members of board accompanied with scientific and industrial advisors who have designed the model practically reviewed and revised.

## RESEARCH THEORETICAL LITERATURE

### Kinds of knowledge

Nonaka and Takeuchi believe that knowledge has two kinds: tacit knowledge and explicit knowledge. Tacit may include subjective knowledge such as experience, simultaneous knowledge use in a specific context, and analogue knowledge relating to practice or application. The root of tacit knowledge is in the human's mind and organizational culture, which is hard to state. In most enterprises, it is rarely transferred and shared. Therefore, when a knowledge owner leaves the enterprise, the knowledge is lost as well. Moreover, explicit knowledge may include objective knowledge such as rationality (mind), sequential knowledge (procedures and rules), and digital knowledge (theory) (Nonaka and Takeuchi, 1995). This knowledge can shared and transferred by Information Technology (IT) and from person to person which is professional, preservable, accessible and in the form of code.

### Knowledge management concepts

Knowledge concept complexity and different approaches around KM cause fragmentation in the direction of knowledge management concept. Too many definitions have been propounded by the intellectuals in this field:

1. Knowledge Management is the discipline of enabling individuals, teams and entire organizations to collectively and systematically initialize, share and apply knowledge, to achieve their objectives more efficiently (Young, 2007).
2. Knowledge management is a key decision making approach and solve current business problems such as competitiveness and the need to innovate in a dynamic, complex and global environment (Wickramasinghe and Lubitz, 2007).
3. Knowledge management is a process of developing, preserving, transferring and applying knowledge in an enterprise, which renders large enterprises' potentiality to

gather knowledge from environment and apply it (Habibi, 2009).

4. Knowledge management is the systematic process of finding, selecting, organizing, distilling and presenting information in a way that improves an employee's comprehension in a specific area of interest. Knowledge management makes an organization gain insight and understanding from its own experience. Specific knowledge management activities the organization focus on acquiring, storing and utilizing knowledge for problem solving, dynamic learning, strategic planning and decision making. It also protects intellectual assets from decay, adds to firm intelligence and provides increased flexibility (University of Texas).

5. Knowledge management is the strategy and process which enables enterprises to initialize and flow relevant knowledge throughout the business to produce organization, customer and consumer value (Smith, 2007).

6. Knowledge management is the broad process of locating, organizing, transferring, and using the information and expertise within an organization. The overall knowledge management process is supported by four core competencies: leadership, culture, technology, and measurement (American Productivity and Quality Center).

In general, researchers define knowledge management in this study as managing the process of initiating, acquiring, preserving, transferring and applying knowledge in order to obtain and maintain business competitive advantage.

### Learning organization

Peter Senge, the father of Organizational Learning (LO), expressed that LOs is the organizations where people continually expand their capacity to initialize the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together (Senge, 1990).

Hence, LO and KM cannot exist without each other. An organization that wants to be a learning one should think carefully about both at the same time. In addition, there is need to consider priorities, objectives and relationships. LO and KM both have common features and have relationship with business process, preserving information, data interpretation, knowledge development and learning reinforcement. Aggestam believes that a LO is about the whole organization which in turn is a part of the world. As a sub-system in the world, the organization must interact with other sub-systems in the world and manage external factors outside the organization, e.g. competitors, and customers. This is necessary for survival. KM is performed in the organization, is a sub-system in the organization. KM is therefore more focused on internal factors inside the organization (Aggestam, 2006).

### Knowledge management technology

Some management intellectuals know KM as a part of Information Management (IM). With time, adherents of this approach decrease; nowadays, a few people emphasize this theory (Data, Information, Knowledge and Wisdom) because of unachieved experience that was the fruits of not considering the structure and organizational culture (Sippach, 1999). KM is much greater than Knowledge Technology but undoubtedly, knowledge technology is a part of KM (Davenport and Prusak, 1998).

KM problem could not be solved just by technology. Studies in the pioneer enterprises for implementing the KMS show KM software and IT merely have 30% effect on KM, and the rest of it is related to the human resource and the enterprise processes (Akhgar, 2010). Besides, on the basis of a scientific poll, changing people's behavior has been presented as the most important challenge in the KM, and culture has been the most significant obstacle to transfer knowledge (Ruggles, 1998). Hereof, we must consider that knowledge management concept without knowledge-oriented technology will have merely restricted capabilities. However, accessibility and expediting in knowledge transmission are two most valuable characteristics of technology in KM due to which IT makes possible extracting knowledge from owner's mind. Then KM can be formularized by IT and can be shared with internal and external partners. IT helps the KM code and occasionally initializes. In a general manner, there are different capabilities for KM software mainly as follows:

1. The possibility to produce standard knowledge packages by the users
2. Multimedia knowledge packages existence (due to which the users are able to transfer information and knowledge in the form of videos, vocal messages, written reports, plans, and images).
3. Accessibility to the share chalkboards: is a tool by which a group of writer can work on a virtual board simultaneously.
4. User classification and accessibility specification
5. Utilizing the groupware: is the software which makes different users work in a form of group on a project at the same time.
6. Initializing knowledge-led group and transferring knowledge packages by users for evaluating, enriching and sharing those.
7. Ability to eliminate or develop general and specialized fields and assign knowledge packages to one or more knowledge field.
8. Expert system: asking capability from user side and presenting response by expert system.
9. To make use of personal page for users to be in association with preserving knowledge packages before transferring to be criticized by knowledge group to present specialized feedback to the owners.

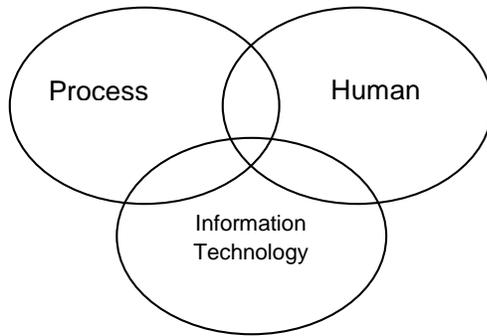


Figure 1. Triple dimensions of KM.

10. Scoring to the quality of the knowledge packages and presenting users ideas to approve those qualifications.
11. Presenting professional motor search related to the word and subject.
12. Providing backup files manually and automatically
13. Creating historic memory and professional statistical report
14. Defining unrestricted multimedia E-mail for users
15. Providing general and specialized glossary associated with references and expert database.
16. Web Browser: provide essential program to search in the web sites and connect to the internet.
17. Automatic and Motivational systems
18. Knowledge Push Systems: is the system due to which prepared knowledge in the KMS is transferred to the related users automatically.
19. Knowledge Filter Function: this system can integrate existing knowledge in the knowledge base for strategic decision-making.
20. Customized Knowledge Visualization: this customized system presents needed information for a user.
21. Video Conference: although far geographic distance this tool gives human resource possibility to participate in the common meeting virtually such as face-to-face communication. Furthermore, video conference can display and define feasible problems by the executors to the top managers and receive the feedback in a moment and consequently it can deduct the related costs such as travel fees and experts relocation. This quality helps managers and experts near each other for prompt decision making in which grand corporation profits exponentially.

After determining the capabilities of the KM software, it is urgent to say that initializing appropriate infra-structure based on IT helps KM toward achievement, known as a proper tool for KM. Anyway, human resource is the foundation of the organization and the movement should be based on human, structure and technology integration towards achieving organizational goals and strategies (Afrazeh et al., 2003). Accordingly, triple dimension of KM is presented Figure 1.

## IIES KM Implementation Model

In general, the main processes of the implementing KM in the IIES have been displayed schematically in Figure 2. The model of implementing KM for IIES consists of 7 steps:

### **Management Project (Stage 1)**

This stage in an attempt to define project statement includes Feasibility Study (FS), risk management and how to control and warrant the project quality. This stage will render qualitative method and by handling focus group meeting with the presence of scientific consultant and industrial consultant will formulate executive group. In this stage following activities will be done:

1. FS preparation (it involves determining the problem, description, mission and vision, project province, core competencies, hypotheses, limitations and project life cycle)
2. Initializing interactive matrix for project activities and products
3. Determining the method of quality management
4. Determining the method of project control
5. Determining risk management in the project
6. Defining general and specialized glossary

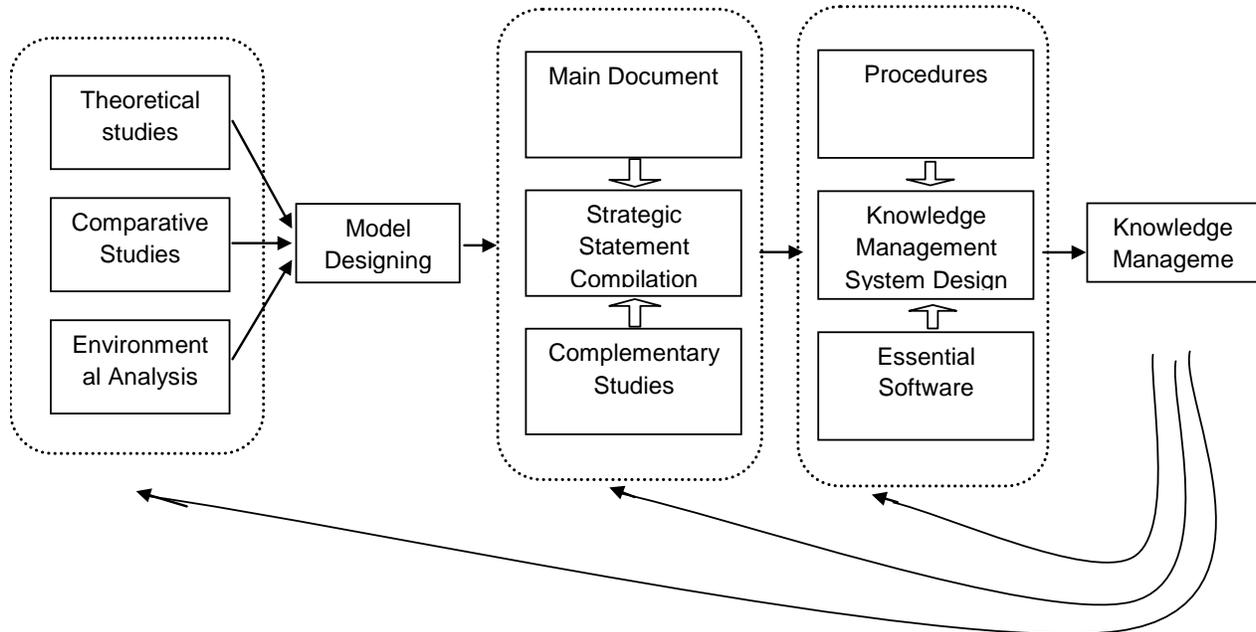
### **Analyzing and surveying the background and Literature (Stage 2)**

The second stage will survey theoretical concepts and literature of the previous similar projects in the world to practice the experience productively toward better implementation of KM in the pilot section. Therefore, executive group gathers KM theoretical concepts from library and valid websites from internal and external oil company by fiche. Main activities in this stage are defined below:

1. Determining research Literature and theoretical fundamentals
2. Deriving background (it includes in comparative studies oil enterprises in the world, comparative studies about internal companies and surveying best practice in this field)

### **Knowledge study about pilot section and external environment (Stage 3)**

In this stage, the third stage, SWOT analysis will render the pilot section for implementing. Hence, by document analysis and interview, the requirements of KM implementation in the pilot section will be analyzed. Then the strengths and weaknesses are determined by qualitative methods such as Brainstorming, Nominal group and Delphi meetings. These principal activities are:



**Figure 2.** Conceptual model of main processes of implementing KM in IIES.

1. Pilot section recognition
2. Surveying mission, vision, objectives, strategies and procedures of KM
3. Analyzing the requirements of KM implementation in the pilot section (involves cultural, technological, structural organization dimension)
4. Defining organizational communication in the field of knowledge
5. Recognizing external environment of pilot section
6. SWOT and PESTEL analysis in the field of KM and implementation method
7. Designing the methodology and optimized model of KM pilot section

#### **Formulating strategic statement of KM in pilot section (Stage 4)**

In the fourth stage, according to previous studies and with the use of semi-directed interview (focus group has a meeting with the presence of five managers) filled out by top and middle managers, strategic statement of KM was formulated in pilot section (it contains knowledge vision, knowledge mission, knowledge objectives, knowledge strategy and KM). These significant activities are:

1. Formulating knowledge vision statement
2. Formulating knowledge mission statement
3. Formulating knowledge objectives
4. Formulating knowledge strategy
5. Preparing strategic statement of KM

#### **Designing and formulating KMS (stage 5)**

This stage formulates KMS in the pilot section. On that ground, with the use of the results of stage two and three formulated strategic statement for KMS in the pilot section was composed. Because of that, after preparing KMS draft by executor group by handling nominal group meeting (with the presence of five internal beneficiaries) the statement will be finalized. The main activities are:

1. Recognizing general and specialized fields of knowledge
2. Composing knowledge group relying on knowledge fields
3. Composing the coding procedures and formulating existing knowledge in the pilot section
4. Designing KM processes
5. Designing and formulating motivational procedure
6. Defining crucial technology requirements
7. System analysis and presentation of software logic
8. Formulating knowledge regulations, rules and procedures derived from project
9. Designing and presenting appropriate organizational hierarchy for KM

#### **Pilot implementation of KM software (stage 6)**

The goal is KM implementation in the pilot section. In this stage with the use of consequences in the second and third stages, available soft ware in the field KM prepared

by the specialized KM enterprises will be surveyed and analyzed. In addition, the most appropriate software in this field will be ordered by the confirmation of Management Information Technology (MIT) in the pilot section. The significant activities in this area are:

1. Structure preparation for needed technology
2. Software experimental implantation
3. Software testing and finalizing modifications

### ***Culturalization and Education (stage 7)***

The seventh stage operates KM software and spreads the culture by education in the pilot section. For this, knowledge mottos, educational brochures, and user guidance will be provided for users in the pilot section. Then with the support of educational workshop toward more familiarization about KM, essentials and functions (KM software) in the pilot section will be managed. Additionally some specialized educational meetings will be held for knowledge brokers and experts, who will participate in KM department in future. Next activities would be done:

1. Providing KM handbook for users
2. Formulating procedures for utilizing the software
3. Managing educational workshop: familiarizing with KM essentials and functions and knowing about KM softwares
4. Specialized education to knowledge brokers and experts

### **Conclusion**

Nowadays, knowledge as a strategic resource and core competency plays a key role in all enterprises. For efficient use, KM will be the most significant function of the enterprises such as global, pioneer, oil companies. KM is based on three principles; human, structure and technology. KM will help the organization to achieve its objectives and strategies by preparing appropriate infrastructure and utilizing the knowledge resources with the orientation of human capitals as knowledge users.

That prepares enterprise to pass industrial age toward knowledge age and to develop knowledge base and learning organization.

As found, KM implementation is a gradual process. Furthermore, there are different methods of implementation, which lead to different insights and organizational diversification and requirements in KM implementation. On this basis, this paper is the fruit of the IIES studies in the field of KM from 2007 to date in the form of scientific method of KM implementation.

### **REFERENCES**

- Afrazeh A, Bartsch H, Hinterhuber HH (2003) Effective Factors in Human Activities and Knowledge Sharing, International Working Conference IFIP WG 5.7, "Human Aspects in Production Management", European Series in Industrial Management – Esim, Company, Aachen, Germany.
- Aggestam L (2006) "Learning Organization or Knowledge Management: Which Came First, the Chicken or the Egg?" *Infor. Technol. Control* 35 (3):295-302.
- Chen J, Zhu Z, Xie HY (2004) "Measuring intellectual capital: a new model and empirical study, *J. Intellectual Capital* 5(1):195-212.
- Davenport TH, Prusak L (1998) *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, MA.
- Drucker P (1995) *the Post-Capitalist Society*, Oxford: Butterworth – Heineman.
- Habibi A (2009) *Implementing Knowledge Management in Engineering Organization*, Ark
- Nonaka I, Takeuchi H (1995) *the knowledge – creating company*, Oxford University Press. Oxford.
- Ruggles R (1998) "the State of the Notion: Knowledge Management in Practice", *California Manage. Rev.* 40(3):80-89.
- Sippach M (1999) Aktuelle software Loesungen im Bereich Wissens management, in: *HDM Praxis der Wirtschaftsinformatik*.
- Wickramasinghe N, Lubitz Dag von (2007) *Knowledge-based Enterprise: Theories and Fundamentals*, Idea Group Publishing.