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Preserving the Environment through Knowledge Management

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Abstract: *The environment quality is of high importance in all countries. One of the important achievements of rationalizing bioenvironmental issues is identifying works with harmful consequences in the future. Many thinkers believe that if man could learn constructive knowledge in steady development and attempt to practice them, he has made the biggest discovery and invention in the world. This is impossible except through appropriate knowledge management. Since each measure is concerned with a social or economic purpose, it inevitably affects the environment. Therefore, deciding regarding such issues requires having appropriate information and knowledge and timely transference in order to prevent the incidence of irreparable damage to the environment. Such damage and its consequences can not only affect the intended society, but also harm other societies, which can be irreparable. Here, the importance and role of knowledge management in making such decisions are manifested. In this paper, the importance of knowledge management in preserving the environment is analyzed while presenting a model, the point less considered in the previous studies, but can be of highest importance.*

Keywords: *Environment, Knowledge Management, Implicit Knowledge, Explicit Knowledge*

I. Introduction

Nowadays, preserving the environment and achieving steady development are one of the critical issues, which is at the top of the agenda for many different countries through implementing comprehensive economic, social and cultural plans. On the other hand, the success factor of organizations in the future is moving toward Knowledge Management (KM) and knowledge-orientation. The experience of economic development in different countries has shown that the quantity and quality of bioenvironmental resources have been decreased along with the trend of population growth. This issues has caused the bioenvironmental crisis in the world.

On the other hand, making any decision concerning economic or social issues will have consequences on the environment. The mere decision-making only for its justifiability in terms of profitability and economic boom will cause irreparable damage to the environment in the case of disregarding its bioenvironmental consequences. At the present age in which knowledge and knowledge economy are considered as the important factors in gaining competitive advantage, decision-makers need comprehensive knowledge and information. In today's dynamic environment, having a comprehensive database along with knowledge-oriented individuals can provide the organization with both implicit and explicit knowledge and can help decision-makers in making optimum decisions with less destructive consequences on the environment. Achieving this important issue requires implementing KM system in the organization. The objective of presenting this paper is emphasizing the importance of KM in protecting the environment through making optimum decisions. The point, which is less considered in the previous studies, but can be of highest importance.

II. The Environment

Paying attention to the environment and preserving the health of the Earth's creatures are one of the main principles in life survival and using God-given gifts, which are abundantly available. Air pollution, acid rain, forest destruction, soil erosion, shallow and underground waters are considered among the effects of population growth increase and economic development in developed countries. The environment is a massive and intricate set of various active components and factors formed by a gradual trend and development of living creatures. This set is consisted of water, air, energy, and biological life, which encompasses the nature and all living creatures, affects man's activities and is influenced by them.

To prevent the environment destruction, all humans including decision-makers and people at global, national or particularly local levels should understand development should have a steady trend and its fruits should be for both the present generations and the future ones. On the other hand, the most effective and most important factor of the bioenvironmental changes can be considered man himself in which he is created. To survive life in the environment, he pollutes and destructs the environment by activities such as agriculture, industry and use of resources and facilities while making useful and appropriate changes. For example, major oil and gas sources are considered among the natural God-given gifts that should be used reasonably as national and valuable

capital. In discovering and extracting and converting them to oil products, they can cause bio-environmental pollution in water, soil and air in addition to meet a major part of society's economic need.

A very wide group of non-carbonated and hard stone such as granite and gabbro, which are often considered as igneous or metamorphic rocks and are sold as the trademark of granite stone are capable to emit radioactive radiation. Therefore, the WHO is preparing instructions to use these types of stone properly in building houses in order to reduce their bioenvironmental dangers.

A number of important urban problems and conflicts, which are indispensable to be predicted in urban and regional plans to control and reduce their effects on the environment are:

- The pollution of the fuel of automobiles and factories
- The noise population of developing cities
- Water pollution due to industrial sewage and garbage disposal

Such issues have made preserving the environment to be one of the main discussions of steady development in different countries. By analyzing the laws of the Fourth Development Plan in Iran and comparing it to the past plans, the difference of the position of the environment can be realized. In the Fourth Development Pan, in the direction of achieving steady development in the country and considering the determined frameworks in the fiftieth principle of the Constitutional Law, it is attempted to adapt the development trend especially economic and industrial development in the country with the requirements of the environment to prevent from unsteady development. Thus, one of the six pillars is named "preserving the environment, spatial planning and regional balance.

In Article (105) and the paragraph "c" of Article (104) "the law of the Third Economic, Social and Cultural Development of the Islamic Republic of Iran, adopted on 5th April, 2000 and its amendments", which was also ratified for the Fourth Development Plan it is stipulated that "All large manufacturing projects and services should be assessed in terms of bioenvironmental conditions before and during the stage of feasibility studies and site selection, based on criteria proposed by the Supreme Council for the Environment and the Council of Ministers. Observing the results of the evaluation is necessary by the operator of the above-mentioned plans and projects. Monitoring the good implementation of this Article shall be the responsibility of Plan and Budget Organization.

Note: The Environmental Protection Agency is responsible to provide practical and implementable solutions of the development projects and job creation in protected areas so that environmental issues are considered and development plans are implemented.

Also in paragraph (c) of Article 104 it is stipulated that:

(C) To reduce environmental pollution, especially in natural resources and water resources, production units are obliged to adapt their technical specifications with environmental criteria, and reduce pollution. Expenditure made in this case are regarded as acceptable costs of the units.

Those firms that refrain from doing so and their activities cause pollution and environmental degradation, the penalty, proportionate to the damage, is taken to the general revenue in order to be spent in the form of the annual budget bills for projects of purifying the environment. The regulations of this paragraph, including the amount and how to charge and spend the cost are approved by the Council of Ministers suggested by the Department of Environmental Protection.

Therefore, according to the importance of preserving the environment and the necessity to make decision properly concerning the implementation of economic, developmental and other projects, KM seems indispensable to make optimum decision that not only achieves the set goals in any organization, prevents any damage to the natural resources and the environment. A system that can provide decision-makers with necessary information and knowledge including necessary classified information (explicit knowledge) and implicit knowledge, but what is KM and how this important issue can be achieved?

III. Knowledge Management

There is no consensus over the definition of KM. One of the reasons of this lack of consensus is owing to this fact that active individuals in the field of KM include a wide range of fields. Nevertheless, most of the definitions are similar in one point: hang a practical perspective to knowledge. For example, how knowledge can contribute to the organizational efficacy (Hlupic, 2002). In addition, there is still no consensus over the concept of knowledge. Some consider knowledge as goods that can be saved and be independent of time and place, while others regard knowledge naturally social and environment-depended. Thus, the separation of the concepts such as data, information, implicit knowledge and explicit knowledge is of particular importance. Most of the discussions regarding knowledge separate data, information and knowledge from each other. For instance, Miller and Morris (1999) regard knowledge as the intersection of three factors of information, experience and theory. This issue can be expanded so that it includes reason, which is possibly describable under the title of successful practical knowledge with the nature of implicit knowledge.

Regardless of problems in defining knowledge, it is evident that knowledge is an organized combination of ideas, laws, procedures and information. Quinn (1996) considers knowledge equal to professional intellect and wisdom. According to this view, organization cannot create knowledge, but individuals who are in the organization create knowledge. Therefore, part of knowledge is converted to general goods, which is analyzed and interpreted by social members. However, another part of knowledge remains exclusively in individuals' field and mastery. The knowledge cannot be transferred completely and is merely perceived through individuals (Nonaka, 1995; Nelson, 1982).

Cook and Brown (1999) separate organizational knowledge from organizational awareness. They pointed out that knowledge is a phenomenon that a person has presented it as the ontology of data. They argued that in addition to the existent knowledge, there is a principle in knowledge, which cannot be obtained by the described examples of knowledge. For example, one may have the knowledge of what is cycling, but cannot ride bicycle alone, because it requires knowledge rooted in practice and act. Knowledge as act requires the identification of the nature of the act. The identification of the characteristics of knowledge is necessary. Thus, the characteristics of knowledge are dealt with in the following according to the presented views.

Characteristics Of Knowledge

- Knowledge is something beyond information and data. In fact, knowledge is more valuable than data and information for organization. The attachment of knowledge to organization and individuals working there is higher than to data and information (Kakabadse et al., 2003).
- Knowledge is intangible. Therefore, an increase in organization's knowledge cannot be measured directly using physical tools like other physical assets such as employees, land, and equipment (Romer, 1986, 1990).
- Knowledge is attached to those who carry it. In addition, knowledge is attached to the environment in which it is created, published and used in addition to its carriers (Nonaka, 2004). This feature makes knowledge not to be easily transferrable from one person to another, from one organization to another and from the present to the future compared to other organization's physical assets.
- Knowledge should be useful for organization. In a case where knowledge potentially cannot solve organization's problems and is not useful in any organizational aspects, there is no need to be taken into account as one of the organization's assets. When knowledge is considered important in the literature of KM that helps to solve organization's problems or achieve its objectives. Otherwise, useless knowledge is not considered in the literature of KM (Toffler, 1983).
- Creating and using knowledge regardless of man's cognitive capabilities seem an impossible issue and knowledge is highly dependent on knowledge individuals and carriers. Although, theoretically, creating knowledge without using human capabilities is possible in rare cases through using artificial intelligence, but the main element of creating knowledge in each organization is its manpower (Nonaka, 1994, 1995; Drucker, 1999).
- Network form is another characteristic of knowledge. It means that a set of different types of knowledge should be with each other in order to be value-creating for organization. In fact, the value and effectiveness of one field of knowledge is highly dependent on other types of existent knowledge in the knowledge network (Teece, 2000).
- Knowledge, like other organization's assets can be amortized. This issue is analyzable from two aspects, in the first aspect, some types of organizational knowledge may be voluntarily eliminated, which is called "memory decay" (Deholan, 2005). In the second aspect, its value and efficacy may be decreased with passing time in the direction of achieving organization's objectives (Hedberg, 1981). The purpose of knowledge timeliness is the event occurred in the second aspect. Therefore, knowledge can lose its value with passing time and would not have its previous value-creation for organization.
- The capability of publishing and distributing knowledge may be different from other organization's assets owing to its particular characteristics. When the knowledge of one organization is transferred to another organization in the field of human resources, in fact, nothing is reduced from the knowledge of that organization in the field of human resources. This is a typical example concerning this characteristic of knowledge. In some cases, the value of the transferred knowledge in the new conditions will be increased owing to the positive effects of anew knowledge network (Shapiro, 1999).
- When new knowledge is acquired, the knowledge is added to the previous knowledge, which in this case is called "knowledge accumulation", but this is a simple case of the characteristic of knowledge accumulation. This process of knowledge development will be problematic when the new knowledge has no relation to the existent knowledge. In some cases, the new knowledge not only is inconsistent with other types of existent knowledge, but also requires considerable changes and formation based on new assumptions, theories and methodologies (Kuhn, 1962).

Knowledge Creation

Creating and using knowledge regardless of man's cognitive capabilities seem an impossible issue and knowledge is highly dependent on knowledge individuals and carriers. Nonaka and Tukeuchi (1995) state that for the first time, Polanyi (19660 in his researches implicitly divides knowledge into two groups of explicit and implicit. This view can be considerable, because most referent authors accept KM and texts of its intellectual capital (Denvenport & Prusak, 1998; Steward, 1997). In addition, many authors after them accept it (Johannessen et al 2000; Kikoski & Kikoski 2004; Seidler-de & Hartmann 2008).

Explicit Knowledge

Explicit knowledge can be formally observable and can be expressed clearly in words, numbers and characteristics. Therefore, it can be transferred through formal and systematic methods in the form of statements, regulations and formal methods and can be simply regulated and codified.

Implicit Knowledge

Implicit knowledge is interrelated with knowledge-owner's experience. Thus, formalizing, documenting and sharing the knowledge with others are difficult. Insightfulness, intuition, beliefs, personal skills are examples of implicit knowledge (Daft, 2001; Chua, 2005). These two groups are interwoven. To comprehend a written document (explicit knowledge), experience (implicit knowledge) is often needed. For instance, a complex recipe is nonsense for a cooking novice and a legal text is everything, but at the same time is incomprehensible with legal education (Kluge, 2001).

To make optimum decision, managers need both implicit and explicit knowledge. In fact, they offer solutions to solve problems by having classified explicit knowledge and using their implicit knowledge. As the accessible information and knowledge are more comprehensive, the possibility of offering better solutions will be increased. The next phase is selecting a solution among different solutions. Since the provided solutions are concerned with different economic or social issues are in accordance with organization's objectives such as better services, profit increase and productivity. In the analyses, its consequences may be ignored or necessary information about other consequences is not provided for the decision-makers. Here, KM system can play a crucial role. The availability of necessary information regarding economic, social ad bioenvironmental consequences (explicit knowledge) along with knowledge-oriented individuals (carriers of implicit knowledge) can lead decision-making process toward optimum choice. The decision that not only help the organization in achieving its pre-determined objectives, but prevents from the probable damage to the environment and in the case of having probable danger, it should inform decision-makers so that they can reform or attempt to offer new solutions by considering the consequences of their decisions.

Thus, explicit and codified knowledge is studies and analyzed and then is considered according to the individual's prior knowledge in that field in the case where is in accordance with the human dimension of knowledge (Nonaka, 1994; Drucker, 1999) new relations can be discovered by combining, comparing and observing their strengths and weaknesses that can complete and expand the previous information and knowledge leading to offering a new solution. These phases are shown in Figure 1.

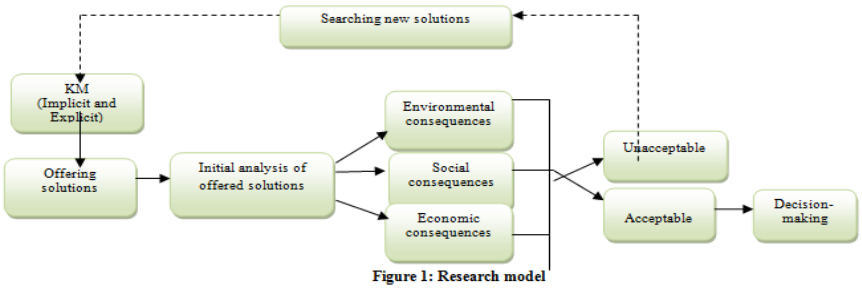

Figure 1: Research model

IV. Conclusion

Preserving the environment and achieving steady development are one of the critical issues, which is at the top of the agenda for many different countries through implementing comprehensive economic, social and cultural plans. On the other hand, the success factor of organizations in the future is moving toward Knowledge Management (KM) and knowledge-orientation. Making any decision concerning economic or social issues will have consequences on the environment. The mere decision-making only for its justifiability in terms of profitability and economic boom will cause irreparable damage to the environment in the case of disregarding its bioenvironmental consequences so that its effects can encompass all societies. Therefore, decision-makers need the knowledge and information relevant to the issue in order to make optimum decisions. In today's dynamic environment, having a comprehensive database along with knowledge-oriented individuals can provide the organization with both implicit and explicit knowledge and can help decision-makers in making optimum

decisions with no destructive effect on the environment. In addition, evaluating bioenvironmental effects requires a strong KM system.

Organizations should provide conditions that prepares the background for creating, transferring and sharing KM. To create such conductions, the identification of knowledge characteristics and way of its creation, reasons and factors effective in its sharing and managing as well as its drawback are necessary. In this paper, while presenting a model, it was attempted to mention the less considered cases in the previous studies. Thus, the crucial role of KM as an effective factor in preserving the environment was discussed in order to be a turning point to emphasize KM as a key factor in achieving steady development and preservation of the environment.

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