The Role of Knowledge Management in Architectural Projects

Leili Iranmanesh and Ali Mohammad Iranmanesh

Abstract-The countries in the world, by relying on innovation, increase productivity and improve the economic statuse.One of the main reasons for this attention is competition between communities.Flexibility and rapid response against the variable environmental conditions, best use of human resources and knowledge and also you make the best decisions, are the achievement of knowledge management for organizations in these days. In today's world, the power of societies depends on the scientific development and the ability to use the current science of the world. Therefore a society will be considered successful that is mastered in producing, achieving and applying new scientific findings and is able to have efficient output in shorter time in comparison with others. On the other hand the organizational and managerial attitude will remove some mistakes and will speed up the scientific enhancement. Although Knowledge Management has been mostly in organizations, it is useful in the process of organizing the growing rate of scientific developments.

Architecture is a multi-dimensional science, with artistic, technical, cultural, and humanistic approaches that creates spaces by using other sciences such as physics, psychology, sociology, economy, etc. Because of being in the area of knowledge and activities based on managerial and organizational approaches on the one hand and the direct relation of architecture with man's daily life in different environments regarding the capabilities connected to knowledge management on the other hand, Architecture can be lead to improving human life if its strategies are applied.

Index Terms—Architecture, knowledge management, organization, architecture design.

I. INTRODUCTION

In researches on the effects of organization, different methods and tools have been introduced, that each of them provide some steps for succeed of organization, Knowledge management is one of these steps that today it causes the progress in the world.

In the management studies always is tried to consider the knowledge management styles as independent variables, so by it can be change the organization structure. It is predicted that with increasing knowledge in an organization, performance will be increased.

In the recent years, Knowledge management has turned into an important and controversial issue and both scientificand commercial communities believe that organizations can keep their long term superiority in

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competitive fields with the power of knowledge and the future world will be a knowledge based world[1]. Architecture is a science that all human deal with it, because they are frequently in environments and spaces that need to be assessed based on architecture and are designed by technology and equipments.

Therefore, paying attention to the relevant and useful technical and scientific advances in architecture will enhance human life. Although organizations have paid more attentions to knowledge management, it can be assessed as a useful strategy in organizing development, application, and knowledge production.

According to this, architecture can be placed as a science in the area of knowledge management. On the other hand Administrative nature of architecture design is an organizational nature. To do a project, a team of experts cooperate to achieve the determined aim which can be designing, implementing, auditing, and building maintenance. Therefore the function of knowledge management can be discussed in 2 ways.

II. ARCHITECTURE

Creating architecture is something more than setting up a physical configuration and includes functional values [2]. Architecture has defined the science and the art of forming human living environment. Architecture has been always considered as a poly tactic issue and is the interface of 3 areas of science-technology, the humanities, and art[3].

In his book, The Seven Lamps of Architecture, John Ruskin defines Architecture as "the art of setting up and ornamenting a building by human... it has a strong and firm organization, it has profound geometry and most of all is a creation that displays beauty and avoids monotony and boredom [4].

Architecture expresses ideas and values through a system of visual elements [5]. Efforts have been made to distinguish architecture from common superficial attitude and to explain its range and scope of its work which is directly related to human soul.

III. KNOWLEDGE MANAGEMENT

Knowledge is known as an important source of competitiveness and value creation, an essential element for sustainable development and in general as a determining factor for companies with global aspirations. In addition, the knowledge that corporations are identified, a dynamic resource that requires careful management to be fed and [6].

Knowledge management is managing and preparing an organization for collecting knowledge, sharing and using as

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an organizational capital to achieve its goal; and its major effect on reinforcing and stabilizing managerial decisions leads to the highest performance in the system [7].

Many researchers have introduced the details of knowledge in the form of four levels (data, information, knowledge, and wisdom)[8].

Socomaro says: knowledge management is a practice that aims to control and apply knowledge and information and unconditional access for every staff in an organization in order to have them do their job in a better manner[9].

Gloet and Terziovski define Knowledge management as followed: formalization and access to experience, knowledge, and expertise that create new capabilities, enable superiorperformance, encourage innovation, and enhance customer value.

Analysis of defines of the knowledge management shows that many of them are in a similar case: whether knowledge management to improve organizational performance. Today, all organizations, large and small, need to implement knowledge management.

Parlby and Taylor (2000) believe that knowledge management supports, creates new ideas and seeks to use thinking power in organizations[10]. Knowledge management has to dimensions: 1- managing data and information2- managing personnel that are cable and skillful and have special talents.

For nominating the relationship between knowledge management and affecting the usage of a government, we should refer to the per formative models of knowledge management that are discussed for affecting in works. Therefore, one of models that are presented by Probest et al (2000)for the process of knowledge management and is more complete those other models is considered and according to it the development of model in organizations is done. In figure 1, the characters of this model are shown, each of which is counted as a shape of a composer block. This model shows more obvious picture of steps and activities of knowledge management [11].



Feedback

Fig. 1. the process of knowledge management, the model of Probest et al.

IV. STEPS OF KNOWLEDGE MANAGEMENT IN ARCHITECTURE

In the other words, we can categorize the step of knowledge management and the effect of them in the architecture and it can be defined as the follow:

A. Need of knowledge

Mysterious of a goal organization is like a lack of sail in a ship or elating of a sail in a windy condition, Architectural goals are often designed for the purpose increase of value of human life, it is possible to use the process of knowledge of organization for realization the goal. By realization of this step, the next step for development of knowledge will be started.

B. Development and Improvement of Knowledge

Development and improvement of knowledge in an organization is possible by different methods. Some of these methods cause the improvement of knowledge by means of sources outside of organization that are called the methods of trade of knowledge. The straightest and often the most effective way for trading outside knowledge is buying the knowledge outside of organization, that means servicing an individual or individuals who own the needed knowledge. Not only the needed knowledge existed in outside organizations, but also it can be rented. The current method for renting the knowledge is financial support of firms from research institutes or universities, in front of trading the right of using the research results exactly after their reach[8].

C. Expansion and Emission of Knowledge

The knowledge that is produced or bought in an organization, in architectural project it is necessary to have some new experiments aboutnew shapes of structure, materials, the affect of environmental impacts on the structure and etc. and surely have to use the other experiments and knowledge and this fact depends on expansion and emission of knowledge.

D. Beneficence of Knowledge

Architecture should use existing humanistic power and new technology and environmental impacts to perform the new knowledge. The process of erecting a knowledge in a architectural project is a long term process, however using it can be a suitable help for affecting an organization in a way that make the process of architectural project easier.

E. Protection and Save of Knowledge

If architectural project can use more from the existing knowledge, they should save the knowledge. The knowledge is a valuable power and loose of its save means losing it. Save of knowledge is better than buying it for the second time. In these architectural projects, the knowledge information yield is changed to writing for its better expansion and saves.

F. Evaluation of Knowledge

In the architectural projects and in the all of step of it, the program will be evaluated, and this again happen for improving the program in knowledge. If it will be a need to use the characteristics of that knowledge which is in the step of performance in the next year, we should module it and know how it is effective or not.

V. THE RELATION BETWEEN KNOWLEDGE MANAGEMENT AND OPERATION EFFECTIVENESS

Operation is usually evaluated by two criteria of efficiency and effectiveness, efficiency is proper performance of tasks by saving sources and equipments, achieving the most output with the least input. Effectiveness is performing appropriate tasks and achieving the objective [12]of operation, doing entrusted tasks and responsibilities.

In other words, it is the behaviors that people show in relation with their job[13]. Desslermentions individual behavior, motivation, positive reinforcement, job enrichment, morale, organizational structure, group relations, leadership, learning and training, organizational change and improvement of the most factors in the operation of organization [14]. Copleman believes that operation is the result of importance of motivation[15].



Fig. 2. Steps of Architecture design

VI. ARCHITECTURE AND ORGANIZATIONAL ATTITUDES

Designing architecture requires different people's cooperation with various specialties. Therefore, in the definition of organization, although architecture is not introduced as a separated section, it can be considered as a separated section in the process of performing the entrusted task in a different point of view. If we consider the organization as a section which includes unites and

individuals, clear objectives and, rules and regulations, architecture contains triple tasks of the organization in fulfilling tasks which perform the projects under the supervision of architect.

VII. THE PLACE OF ARCHITECTURE IN CONSTRUCTIONAL PROJECTS

A constructional project is performed with cooperation of different groups of experts in four levels.

- Regional studies: In the primary studies which is the base of initiating a constructional project, urban planning and architecture experts will investigate the issue precisely and its uses and regulations and conditions of the region and provide the consequences and results of the similar investigations in the form of comprehensive plans.
- 2) Architecture design: Architects provide the required plans (phase one) in 4 steps. These steps are shown in figure2.
- 3) Executive Design: calculations, detail designing, providing executive plans (phase two) are done in this step by structural engineers, mechanics and electronics engineers mostly under the management of Architecture engineers.
- 4) Constructing: in this step, the designed plans and maps are performed under the supervision of architecture engineers in most countries.



VIII. COMPLIANCE OF OBJECTIVES AND KNOWLEDGE MANAGEMENT IN ARCHITECTURE

The main objectives and tasks of knowledge management in science and technology are mentioned in such ways that the function and place of each of them can be investigated. Moreover the knowledge-based theories, the knowledge managementcyclein architecture is also true.

- 1) Process of production, approving, providing, distribution, and application of knowledge
- 2) Creation of ability and skill for changing through knowledge
- 3) Shaping the interactional patterns between technologies, skills and individuals
- 4) Stimulating creativity and innovation

IX. ARCHITECTURE AND KNOWLEDGE MANAGEMENT

Architecture is a science which is associated with other sciences in its own scope. These sciences can be divided in the following categories:

- 1) Basic sciences, including physics (the effects of forces, and physical properties of materials, etc.), chemistry (chemical properties of materials, etc.), mathematics,
- 2) Humanities:since Architecture is in direct contact with human and its history and thoughts in producing its own output, it needs to contain some information from other sciences such as sociology, psychology, history, and aesthetics. In addition, economics and management are in direct relation with architecture.
- 3) Natural Science: a general understanding of climate and geography, physiology of the human body, etc.
- 4) Art: the fundamentals and the psychology of color, knowing forms...
- 5) Engineering: Structural Engineering, Industrial Engineering, Mechanical Engineering, PowerEngineering, etc.

The extensiveness and role of science and technology, especially in the field of architecture and particularly its diversification and specialization in the process of architecture highlights the importance of Knowledge management. It will cause not only knowledge property and experiences in various fields and projects to become usable for achieving objectives, but also evolution and application of knowledge will become systematic.

X. RESULTS

Architecture is a multifaceted science that creates their products based on the organizational approach. Academic nature, organizational approach, close relations of architecture with various aspects of humanities, the economy, the broadness of architectural knowledge and attention to the goals of knowledge management for advancing knowledge , its application and direction makes the importance of knowledge management more clear in the field of architecture.

The increase of experiences in the world of architecture and lack of supervision and management on a global scale in this field on the one hand and the impact of various scientific findings in the field of architectureon the other hand will become systematic by the application of knowledge management and this will lead to a faster development in the scientific and operational aspects of architecture without experiencing others' experiences.

REFERENCES

 K. Bamforth, "Social and Psychological consequences of long wall coal Trist," *E. L. and mining, Human Relations*, vol. 2, pp. 53-58, 1951.

- [2] M. M. Falamakue, "Roots and trends in architecture," *Research and Cultural Institute of Faza*, Faza Publishing, 2003, Tehran
- [3] S. J. Imami, "Principles of architecture and urbanism," Knowledge and Technology University, Tehran
- [4] G. Akramie, "Architecture definition, the first step of training (challenges and contradictions)," *Fine Art Magazine*, no. 16, pp. 33-48, 2004.
- [5] S. H. Mirfakhreddini, S. H. Hatami nasab, R. Taleeie far, and A. R. Konjkav Monfared, "Knowledge management, innovation, knowledge and practice of innovation in small companies," *Business Outlook*, no. 2, Summer 2010, Iran
- [6] M. Subramaniam and M. A. Youndt, "The Influence of Intellectual Capital on the Types of Innovative Capabilities," *Acad Manage J*: vol. 48, no. 3, pp. 450-463, 2005.
- [7] P. Shams Zadeh, "The development of management," Bureau of Statistics and Information Technology Ministry of Health and Medical Education, 2010, Tehran
- [8] D. Longbottom and P. Chourides, "Knowledge Management: A Survey of Leading UK Companies," in proc. Of 2nd MAAOE International Conference, 2001, Versailles, France, UVSQ Press, pp. 113-126
- [9] A. Aria Zand, "Knowledge management in the decisions of school administrators and education in Tehran," *Journal of Management*, Year VII, no. 17, Tehran, 2010.
- [10] Y. Wen, "An effectiveness measurement model for knowledge management," *Knowledge-Based Systems*, vol. 22, pp. 363-367, 2009.
- [11] R. Probest, "Maning knowledge building blocks for success," John Wiley and sons, Inc., 2000
- [12] S. Robbins, "Organizational behavior management," Institution of business research and studies, 2003, pp. 13-14.
- [13] M. Griffin, "Organizational behavior foundation," 2000, Morvarid, Tehran.
- [14] G. Dessler, "Management foundation," Tehran, Upper Saddle River, New Jersey, Prentice Hall Publishers
- [15] E. R. Konpelman, "Managing productivity in organizations," Mc Craw Hill,Inc, 1986, pp. 98.
 [16] A. Siah Bazi, "Knowledge of officials of necessary principles and
- [16] A. Siah Bazi, "Knowledge of officials of necessary principles and skills," Sharif University of Technology, Budget and Planning, 2003, Tehran.
- [17] A. Vahidi, M. Aghajani, and E. Nazerian, "Knowledge Management in the Petrochemical Research & Technology: path traveled," Petrochemical Conference, 2008, Iran.

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