Ain Shams University
Faculty of Engineering
Architecture Engineering

Application of Knowledge Management in Construction Sector: Design Phase

A Thesis submitted in partial fulfilment of the requirements of the degree of Master of Science in Architectural Engineering

By

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Examiners Committee

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Statement

This thesis is submitted as a partial fulfilment of Master of Science in Architectural Engineering Engineering, Faculty of Engineering, Ain shams University.

The author carried out the work included in this thesis, and no part of it has been submitted for a degree or a qualification at any other scientific entity.

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Abstract

The Architecture, Engineering and Construction (AEC) sectors are very important sectors for the world economy. The construction projects are unique kinds of project, as each project has its own conditions, contracts and phases, according to the type of the project. They take a long time to be accomplished and many disciplines are involved in the project. Nowadays the construction projects are becoming more complex. One of the essential project phases, is the design phase, where the customer's requirements, design concepts and constructive aspects and standards are defined.

In the design phase there is great amount of knowledge which is generated through the different stages of the design phase. This knowledge is used to produce the required documents that facilitate the construction phase and define all the project aspects. Unfortunately, there is a problem in the flow of knowledge in the design process. This is because of lack of communication among the parties involved in the design phase such as the owner, project manager, consultant, in some cases contractor, etc., as well as the lack of sharing knowledge among people and from phase to another, which cause taking decisions and solving problems according to uncertain knowledge about the project. As a result, rework occurs in the design and construction and consequently there is overrun in cost, time and effort.

For that reason, it is important to manage and control the knowledge in the design phase to facilitate the process of taking decision and solving problems. One of the management fields which is concerned with knowledge control is knowledge management. This field provides processes, tools and procedures for managing knowledge and making sure that it is transferred effectively. Therefore, the main objective of the thesis is to propose a conceptual framework that could integrate the application of knowledge sharing factors with the design phase activities to know their effect on the performance of the design process through reducing rework and delays.

To achieve the research objective an intensive literature review is made on the design process and the knowledge sharing process to explore

the success factors of knowledge sharing. Then, a case study method is used to verify the framework through making a survey in the company under study and then investigating four projects that were delivered in this company. Data collection for the projects depends on documents on these projects from the company and making interviews with the project managers of these projects. The findings confirm the importance of knowledge sharing in projects in the design phase, but the application of knowledge sharing only is not enough to reduce rework and delays in the projects as there are other factors that cause rework in projects such as client changes and time pressure. Moreover, knowledge management and knowledge sharing are concerned with the tools used to manage and share knowledge, but application of tools only is not enough to improve the performance since it is also important to study the type and quality of the managed and shared knowledge.

Keywords

The Architecture, Engineering and Construction (AEC) sectors, construction field, design phase, rework, knowledge, knowledge management, knowledge sharing

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