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Risk management in construction projects: a knowledge-based approach

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Abstract

One of the major roles undertaken by a project manager is the management of the risk of a project. However, this duty is particularly complex and inefficient if good risk management has not been done from the beginning of the project. An effective and efficient risk management approach requires a proper and systematic methodology and, more importantly, knowledge and experience. Previous research results in Chile have shown that both, owners and contractors do not systematically apply risk management practices, resulting in negative consequences for projects' performance. This paper addresses the problems of risk management in construction projects using a knowledge-based approach, and proposes a methodology based on a three-fold arrangement that includes the modeling of the risk management function, its evaluation, and the availability of a best practices model. This approach is part of a* research effort that is underway. A major preliminary conclusion of this research is the fact that risk management in construction projects is still very ineffective and that the main cause of this situation is the lack of knowledge. It is expected that the application of the proposed approach will allow clients and contractors to develop a project's risk management function based on best practices, and also to improve the performance of this function.

Keywords: Risk; management; knowledge; best practices; evaluation

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1. Introduction

Literature shows that risk management in construction projects is full of deficiencies that affect its effectiveness as a project management function and in the end, projects' performance. For many years, risk management in construction projects has been approached using a reductionist approach that produces poor results and limits the quality of project management. For example, most of the times risk is handled through the application of contingencies (money) or floats (time) that are not determined based on a comprehensive analysis of the risks that can affect a particular project, and that in many cases are clearly insufficient to cover the consequences of risks that do occur during the project realization. Then, in most of the cases projects end with costs overrun and late.

To make an effective and efficient risk management it is necessary to have a proper and systematic methodology and, more importantly, knowledge and experience of various types. For example, it requires knowledge of the unforeseen events that may occur during the execution of a project, on the actions that work well or not when one of these events happens, on ways to assess a risk or estimate the likelihood that it will occur, and so on.

The absence of an effective project risk management function has several negative consequences for participants in a project due to lack of preventive action against the risks and uncertainty that any project presents. For example, the lack of prevention against the risk of scope definition of a project, or environmental hazards or communication risks, between others, leads to delays, significant increases in costs and contractual disputes, among others.

Preliminary recent research results in Chile have shown that companies that hire construction services on a recurring basis do not systematically apply risk management practices in projects, which has resulted in negative consequences for the performance of projects (Wolbers, 2011; Howard and Serpell, 2012). Additionally, a research work by Palma (2007) on claims and contract disputes in a number of construction projects, had reflected the occurrence of a number of risks that were not well analyzed or integrated by either parties, customers or contractors, and that were one of the main causes of some of those claims and disputes.

A major research statement that arises here then is that risk management in construction projects in Chile is done in a very limited and ineffective way and that the main cause of this situation is the lack of knowledge for its realization and the loss of the knowledge generated during the performance of each project that would be useful for new projects. That is, the research statement is that knowledge is a key factor in realizing and improving risk management in construction projects, both from the standpoint of the client and of the contractor.

For this reason, this proposal aims to address the problems of risk management in construction projects from a knowledge-based approach and through a system perspective. Thus, a research effort whose ultimate purpose is to develop a risk management system based on knowledge, to support risk management in construction projects for companies and organizations in our country is underway. The idea is to provide a methodology based on best practices, an assessment tool of risk management based on this methodology, the ability to propose improvements for risk management based on the detection of gaps during evaluation, and the availability of a knowledge base that supports the risk management and has the ability to acquire knowledge from experiences obtained in the implementation of construction projects.

The results of this research will allow a client or contractor first, to develop a risk management function based on best practices, and second to improve the performance of this function along the realization of new projects. The novelty of this approach lies in that it addresses the risk management function from a knowledge-based perspective which does not exist in most of the organizations and companies; in the best practices model that it will be developed and used as a benchmark for evaluation and improvement, and finally in that it will provide an instrument for evaluating current risk management functions applying a maturity model that will be fitted to the conditions of projects performed by Chilean organizations and companies.

It is expected that the risk management system prototype developed during this research effort will be the base for the development of effective and efficient risk management systems in organizations and companies that adopt this approach. At the same time, the knowledge obtained and structured during this research will help companies that already have a formalized risk management function, to evaluate and improve it by using as guidance the model of risk management based on best practices that was previously mentioned.