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TITLE OF DIPLOMA THESIS:

Intergration of risk analysis with construction projects' performance evaluation and control

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ABSTRACT

A key issue for the development of a construction company, in a highly competitive environment, is the proper management of the projects that it has undertaken. Thus, an integral part of the proper management of a construction project is performance and risk management. Traditionally, the perception of performance management was limited to economic terms, which describe the outcome of managerial actions or decisions after they occur. This fact led to sterile monitoring of the level of the company's objectives achievement, without emphasizing to optimization. On the other hand, risk management was limited to reducing exposure to potential risks. However, in recent years, the above perspective has changed radically. Performance and risk are not two new concepts in literature. On the one hand, performance management now focuses on value creation and long-term planning through its holistic view of performance, expanding its classical aspects. On the other hand, risk analysis is no longer limited to the reduction of risk exposure but aims to address risk as a potential opportunity to create value and thereby increase the competitive advantage. These trends create a good ground for exploring the case of integration and the combined application of the two methods. This fact is exploited by the present research, by creating a detailed methodology for the performance management of a construction project in the light of risk analysis. The objective of the methodology is to assess the performance of a project, considering both the risk dimension and the control of performance fluctuations. To achieve this goal, the concept of performance was precisely defined, following extensive literature review on the success factors of construction projects. Thus, a mathematical equation was adopted from the literature, which best incorporates eight critical factors that contribute to the performance of a project. Subsequently, the theoretical background was put on the combined application of performance management and risk management. Integration is not only about aligning the objectives of the two processes, but more importantly, on their complementary function, taking advantage of risk issues to optimize performance issues. A cornerstone of the above reasoning is the view that risk management treats risk as an opportunity and not just as a threat. Based on the above theoretical background, the mathematical model of performance calculation in the light of risk analysis was developed and applied for the first time in a theoretical example of a project. This mathematical model calculates performance holistically, also considering the risk dimension, and then examines whether the performance variation is within the allowed limit, thus acting as a kind of early alert. This audit is made by introducing a new index, the Performance Control Index (PCoI).



In this way, the proposed methodology refers to a decision-making tool, exploited by the project manager.

KEYWORDS

risk management, risk analysis, performance management, performance assessment, performance control