Construction Project Risk Determination and Prioritization (Case study of Gharb Tehran commercial - administrative complex)

Construction Projects play an important role in infrastructure projects in developing countries. Construction projects always encounter and deal with different kinds of risk such as financial problems, political instability, the number of people involved in the project, etc. According to the type, size and complexity of the project, the number and importance of each risk could be different and many projects cannot reach the project goals due to exposure to multiple risks. Many papers have been published on the subject of risk management in construction projects, unfortunately most of them have not been implemented in practical conditions. The aim of this study is to identify and prioritize risks in construction projects. The classical approach used probability and impact for risk assessment, but these criteria do not sufficiently address all aspects of projects risks. On the other hand, there might be a relationship between different criteria. This study proposes the hierarchical dependencies between criteria and sub criteria. Firstly, fuzzy-DEMATEL was employed to compute the effects of different criteria on each other. Then fuzzy-ANP technique was used to determine the weights of each criteria and the risk group for the evaluation of the risk group. Afterward, Fuzzy-TOPSIS approach was used for ranking risks in each category. A Case Study of construction project is presented to illustrate performance and usage of the proposed model. Utilizing library studies and interview with experts, managers and specialists, decision criteria were identified through brain storming, along which about 76 risks were identified and classified. These risks were categorized by the experts into eleven risk groups based on their relative risk. Then important risks were evaluated based on the fuzzy ANP, fuzzy-DEMATEL and fuzzy-TOPSIS methods. Definitely, the proposed methods are suitable to identify and prioritize risks in construction projects when performance ratings and weights are vague and imprecise. The results show that financial risk is the most important risk of Gharb Tehran commercial - administrative complex. The proposed model based on the DEMATEL, ANP and TOPSIS methods in fuzzy environment is more suitable than the traditional decision-making methods in prioritizing risk concerning cost, time and quality.

Keywords:

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-Construction Projects, Identify Project Risks, Prioritization of Risks, Fuzzy-ANP, fuzzy TOPSIS

لینک نتیجه نهایی مقاله در پایگاه سیویلیکا:
https://www.civilica.com/Paper-ICMEI01-ICMEI01_218.html

این صفحه به معنای تاییدیه نمایه سازی مقاله در پایگاه استنادی سیویلیکا می‌باشد. در هر لحظه به منظور تایید اصلاحات این گواهی می‌توانید وضعیت نتیجه نهایی را از طریق لینک فوق به صورت آنلاین کنترل نمایید.