

Construction Risk Management: A Quantitative Approach

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Abstract

Conventional project management techniques are not always sufficient for ensuring time, cost and quality achievement of large-scale construction projects due to complexity in planning and implementation processes. The main reasons for project non-achievement are changes in scope and design, changes in Government policies and regulations, unforeseen inflation, under-estimation and improper estimation. Projects that are exposed to such an uncertain environment can be effectively managed with the application of risk management throughout project life cycle. However, the effectiveness of risk management depends on the technique in which the effects of risk factors are analysed and/or quantified. This study proposes Analytic Hierarchy Process (AHP), a multiple attribute decision-making technique as a tool for risk analysis because it can handle subjective as well as objective factors in decision model that are conflicting in nature. This provides a decision support system (DSS) to project management for making the right decision at the right time for ensuring project success in line with organization policy, project objectives and competitive business environment. The whole methodology is explained through a case study of a cross-country petroleum pipeline project in India and its effectiveness in project management is demonstrated.