

Review on Developing a Model of Risk Allocation and Risk Handling for Effective Risk Management System in Construction Project

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Abstract - Every construction project consists of various risks. During project life cycle, uncertain events take place. Due to these uncertain events, positive or negative impact takes place on project objectives such as time, cost and quality. It is impossible to remove all risks, so we try to identify and mitigate them to prevent project failure. Risk is also defined as probability of occurrence of undesirable event and will have impact on project objectives such as time, cost and quality. Success of an construction project is greatly influenced by proper management of the risks. Risk management is increasingly a critical success factor for major construction projects. This paper aims to identify risks associated with the construction projects and assessment of risks with and classifies them into six types. The process followed by allocation of risks to different parties. After that mitigation strategies are proposed and implemented for case study and risks are again assessed.

Key Words: Construction, Risk, Project, Assessment, Impact.

1. INTRODUCTION

Risk is the chance that an event would occur which will lead to change in the project objectives. To ensure that these events do not lead to failure of the projects, there is a need to manage the risks associated with the projects through adoption of appropriate risk management framework. The concept of risk management, therefore, deals with identifying the risks associated with the project, assessing their probability of occurrence and their potential impact on critical project performance measures, and employing direct and indirect means for either reducing the exposure of the underlying project activities to these risks or shifting some of the exposure to other. Risk management is an ongoing process which continues through the lifecycle of project. The process of risk management involves following stages:

- Risk identification
- Risk assessment
- Risk allocation
- Risk mitigation

Project gets various benefits on undertaking an effective risk management exercise in a structured manner. Risk

management should not be considered as a process established at the beginning of the project conceptualization but it is a continuous process which has to be carried in all the phases of project lifecycle. Risk management also play a role in strategic decision making for the project stakeholders by improving the strategic management through selection of better objectives and associated targets as a result of risk identification, analysis, evaluation, treatment and monitoring process.

2. LITERATURE REVIEW

Sameh M. El-Sayegh, Mahmoud H. Mansour (2015)

In their paper entitled, "Risk Assessment and Allocation in Highway Construction Projects in the UAE" has mainly focused on Researchers aim was to identify various risks takes place during the construction of highway projects in UAE. Probability, impact and overall rating parameters are used for identified risks assessment. Thirty three key risks are identified. Risk priority was calculated for giving priority to risks which will help to identify significant risk. Risk breakdown structure is used for classification of risks. Insufficient planning is most responsible risk for highway construction in UAE. Risk allocation for different risks was given according to respondent's experience. Owner and contractor are main parties in the risk allocation process. External risks are not significant as compared to internal risks.

Laila Mohamed Khodeir, Ahmed Hamdy Mohamed Mohamed (2015)

In their paper entitled, "Identifying the latest risk probabilities affecting construction projects in Egypt according to political and economic variables From January 2011 to January 2013" has mainly discussed on Researchers aim was to identify top major risk probabilities in construction projects according to political and economical scenario. For 32 construction projects questionnaire, site visit and interviews are carried out. This paper describes probability of every risk occurrence and its magnitude during construction. Risks were prioritized according to degree of impact. They detected 7 key risks in Egyptian construction industry such as currency price changes, new tax rates, lack of fuel, unsecured roads, official changes,

workers strike and fire risk. Researchers suggested risk response strategy for key risks that are identified

Anthony J. Perrenoud, Jake B. Smithwick, Kristen C. Hurtado, Kenneth T. Sullivan (2016)

In their paper entitled, "Project Risk Distribution during the Construction Phase of Small Building Projects" has studied that Identification and Communication of risk as early as possible during the construction phase will be helpful for achieving project objectives. Researchers identified 1229 risks for 229 construction projects with duration of 7 years. New indicator is created during this research is risk encounter which measures and defines when a risk is communicated on a project with reference to the project schedule. This study attempted to identify whether the characteristics of risk affect the distribution of risks during construction. ANOVA results show relationship between risk characteristics and risk distribution.

Shahid IQBAL, Rafiq M. Choudhry, Klaus Holschemacher, Ahsan ALid, Jolanta Tamosaitiene (2015)

In their paper entitled "Risk management in construction projects" mainly discusses this study is based on findings of a questionnaire-based survey on risk management in construction projects in Pakistan, reporting the significance of different types of risk, ultimate responsibility for them and the effectiveness of some of the most common risk management techniques practiced in the industry. The study revealed that financial issues for projects, accidents on site and defective design are the most significant risks affecting most of construction projects. As further reported, the contractor is responsible for management of most risks occurring at sites during the implementation phase, such as issues related to subcontractors, labor, machinery, availability of materials and quality, while the client is responsible for the risks such as financial issues, issues related to design documents, changes in codes and regulations, and scope of work. While it may be concluded that the most significant risks must be managed with greater effort to reduce/eliminate their effects on the project.

Mehran Amiri (2016)

In his paper entitled, "Risk Assessment and Allocation in Conventional Construction Contracts of Afghanistan" The main objective of this paper is to assess and allocate significant risks in the Afghanistan's construction industry. Firstly, Risk Breakdown Structure (RBS) was developed. Then, questionnaire was structured to gather the data from construction experts in the construction industry of Afghanistan. According to the findings of this paper, most of risks of conventional contracts in Afghanistan are allocated to contractors or shared between contractors and owners. The authors are hopeful that current research helps international companies who are interested in working in Afghanistan to understand projects' situation, and also

assists local companies in contract negotiations and proper risk allocation. This study may also assist decision makers during the risk response planning and control.

3. GAP IDENTIFICATION

All the papers reviewed above are mainly focused on the risk allocation and risk handling, in construction project. Effective allocation of risks between contractual parties will help for maximization of value of money of the project. Optimal allocation of risks will reduce the overall cost of the project as party in the best position will manage risks at lower cost. But the previous study has not covered the effectiveness of these methods. And it is necessary to cover the success of these methods.

4. PROBLEM STATEMENT

Every construction project consists of various risks. It is important to control all types of risk which happens during project life cycle, but there is one of the problems occur while allocating and handling the risk to responsible stakeholder. Less emphasis is given on this point. Also it causes very high impact on construction project objective. So it is required to develop a model of risk allocation and risk handling for effective risk management system in construction project while allocating responsibility.

5. SCOPE OF WORK

Therefore focus the study of risk allocation and risk handling for effective risk management system in construction project and further proposing strategies for mitigation of risks for construction projects. Optimal allocation of risks will reduce the overall cost of the project as party in the best position will manage risks at lower cost.

6. OBJECTIVES

1. To identify different risks associated with construction projects.
2. To assess the probability of occurrence and impact of each risk during project life cycle.
3. To evaluate impacts of risks on the project objectives such as time and cost.
4. To allocate the risk to related stakeholder.
5. To propose strategy for mitigation of risks.
6. To implement mitigation strategies and compare risks after implementing strategies.

7. METHODOLOGY

The research methodologies are used in order to collect data, analyze data and report on findings and results. The

research methodology selected for this risk management project comprised comprehensive literature review, followed by open interviews and distributing questionnaire surveys to the respondents. Qualitative analysis technique used for data analysis

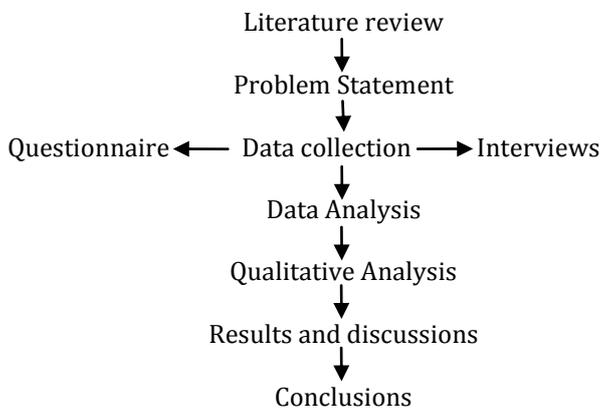


Fig-1: Methodology adopted for research

8. CONCLUSIONS

From the literature review following conclusions are drawn.

- 1) Literature survey carried out for the title selected for project. Through the literature survey problem statement is developed.
- 2) Data required for the research is collected. Techniques used for data collections are interviews and questionnaire.
- 3) Data analysis is carried out. Qualitative and Quantitative data analysis techniques used for risk assessment.
- 4) Then mitigation strategies are proposed for prioritized risks. Proposed strategies are implemented on the site.
- 5) Compare risk factors before implementation and after implementation and suggest guidelines.

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