

A Critical Literature Review on a Study on Identification and Assessment of Risk Factors Affecting Real Estate Projects—Case Study of Central Gujarat

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Abstract: The construction industry is the most dangerous sector of economy. Construction projects are characterized as very complex projects, where uncertainty comes from various sources. Construction projects gather together hundreds of stakeholders, which makes it difficult to study a network as a whole. But at the same time, these projects offer an ideal environment for network and risk management research. Cost saving and time performance are usually essential to all parties who are involved in a construction project that is owner, contractor, and subcontractor. The main causes of disputes in construction projects involve delay and failure to complete the work in the specified cost and time frame. The delivery time of a project is a key factor to the owner in terms of cost as much as it is for the contractor. As such, the objectives of the presented research in this paper are to identify, study, and assess the effect of the factors that affect cost and time contingency.

IndexTerms – Risk Management, Risk Affecting Factors, Risk Assessment, Identification, Cost.

I. INTRODUCTION

Risk Management is a means of dealing with uncertainty – identifying sources of uncertainty and the risks associated with them, and then managing those risks such that negative outcomes are minimized (or avoided altogether), and any positive outcomes are capitalized upon. The need to manage uncertainty is inherent in most projects which require formal project management. Risk management has become an essential requirement for construction projects. Risk management process includes Hazard identification, Risk assessment and Risk control.

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 is not determined based on a comprehensive analysis of the risks that can affect a particular project.

There are many sources of uncertainty in construction projects, which include the performance of construction parties, resources availability, environmental conditions, involvement of other parties, contractual relations, etc. As a result of these sources, construction projects may face problems that cause delay(s) in the project completion time

II. CRITICAL LITERATURE REVIEW

The following are the previous research review based on application of risk management in real estate construction projects.

Jiayuan Wang, Hongping Yuan (2011) studied that the findings do not only provide decision making support for contractors by deepening their understandings of the factors that affect their risk attitudes, but also serve as a useful reference for further studies under this topic. They investigated the critical factors affecting contractors' risk attitudes in construction projects in China in this research. Literatures reviews, interviews and questionnaires are used for the identification of factors affecting contractors' risk attitudes. [11]

O.N. Aneziris and E.Topali and I.A.Papazoglou (2011) found that the quantification of occupational risk of a building construction project. Risk assessment is based on the Occupational Risk Model (ORCA) developed under the Work group Occupational Risk Model project (WORM), in the Netherlands, for quantifying occupational risk. This model assesses occupational risk of a worker, by taking into account his various tasks, activities and their hazards. Risk is evaluated for three types of consequences: recoverable injury, permanent injury and death. [16]

Pejman Rezakhani(2012) found that the risk modeling and analysis is one of the most important stages in a project's success. There are many approaches for risk assessment, and an investigation of existing methods helps in developing

new models. This paper is an extensive literature survey in risk modeling and analytic methods with a main focus on fuzzy risk assessment. [18]

Agnieszka Dziadosza and Mariusz Rejment (2015) presents three different methods of the risk analysis as well as highlighting their disadvantages, advantages and primary areas of application (selection or pre-estimation). These methods differ in their methodology from each other. The verification was started from the simplest techniques using some qualitative variables. The analysis was finished on the statistical method, which determines the type of used data therefore it affects the quality of the results. [2]

Mohamed Sayed Bassiony Ahmed Abd El-Karim and Omar Aly Mosa El Nawawy and Ahmed Mohamed Abdel-Alim (2015) found that the Cost saving and time performance is usually essential to all parties who are involved in a construction project, that is owner, contractor, and subcontractor. The main causes of disputes in construction projects involve delay and failure to complete the work in the specified cost and time frame. The delivery time of a project is a key factor to the owner in terms of cost as much as it is for the contractor. Research in paper was to identify, study, and assess the effect of the factors that affect cost and time contingency [14]

Krantikumar Mhetre and B.A.Konnur and Amarsinh B. Landage (2016) found that construction industry is highly risk prone, with complex and dynamic project environments which create an atmosphere of high uncertainty and risk. The concepts of risk management and various risk analysis techniques to be used for the one stop solution for all types of hazards most likely to occur during any construction project lifecycle. [12]

Mr. Satish K. Kamane and Mr. Sandip A. Mahadik (2016) found that the Construction projects are characterized as very complex projects, where uncertainty comes from various sources. They found that there is a gap between risk-management techniques and their practical application by construction contractor. It presents the identification of risk by different methods, types of risks associated with construction project and different risk mitigation techniques. [15]

Dong Zhao and Andrew P. McCoy and Brian M. Kleiner and Thomas H. Mills and Helen Lingard (2016) studied that designers have improved their knowledge in building construction safety, but compared to builders they present more difficulty in reaching a consensus of perception. Findings of this research are intended to be used by risk management and decision makers to reassess stakeholders varying judgments when considering injury prevention and hazard assessment. [7]

Yang Zou and Arto Kiviniemi and Stephen W. Jones (2016) stated that Risk management in the AEC (Architecture, Engineering and Construction) industry is a global issue. Most of the current efforts have concentrated on investigating technical developments, and the management of construction personnel safety has been the main interest so far. Because of existing technical limitations and the lack of "human factor" testing BIM-based risk management has not been commonly used in real environments. [21]

Aravind Kannan.P, Mahadevan.G, T.Vairamuni (2017) stated that the people working in the industry bear various failures, such as failure of abiding by quality and operational requirements, cost overruns and uncertain delays in project completion. They covers the concepts of risk management and various risk analysis techniques to be used for the one stop solution for all types of hazards most likely to occur during any construction project lifecycle. [4]

A.Q. Adeleke and A.Y. Bahaudin and A.M. Kamaruddeen and Muhammad Waris Ali Khan and Liu Yao ,and Shahryar Sorooshian and Yudi Fernando and Gusman Nawanir and Maruf Gbadebo Salimon (2017) found a significant positive relationship between rules and regulations and construction risk management. As anticipated, rules and regulations were found to moderate the relationship between organizational external factors and construction risk management, with a significant positive result. Similarly, a significant interaction effect was also found between rules and regulations and organizational external factors. [1]

Chitra sen Samantra and Saurav Datta and Siba Sankar Mahapatra (2017) state the concept of risk matrix has been explored herein to categorize various risk factors at different levels of severity for the establishment of necessary actions requirement plan. A case study of a metropolitan construction project for building an underground metro rail station has been reported here to demonstrate application procedural steps of the proposed methodology. [5]

Hanish Verma and Neha Verma (2017) estimated that the High-rise (or) multi storey buildings are the most important part of the construction for the greater development. Given this demand, while high-rise residential structures have become a solution in the metropolitan cities, they remain eluded in tier II cities in India. Low-rise or mid-rise high-density dwelling types have developed in these cities. Most of the high-rise projects remain as proposals. An investigation in this case study reveal that high rise structures are not preferred due to user perception of insecurity in case of fire and high cost of the building. [9]

Francisco J. Forteza and Jose M. Carretero-Gómez (2017) aimed at studying the relationship between risk level and organizational complexity and resources on constructions sites. Our general hypothesis is that site complexity increases risk,

whereas more resources of the structure decrease risk. A Structural Equation Model (SEM) approach was adopted to validate our theoretical model. The model obtained adequate fit, and results showed empirical evidence that the factors of complexity and resources can be considered predictors of site risk level. Consequently, these results can help companies, managers of construction and regulators to identify which organizational aspects should be improved to prevent risks on sites and consequently accidents. [8]

Miss. Amita Pawar and Prof. Snehal Pagey (2017) identified gaps and inconsistencies in the knowledge and treatment of construction and project risk. The paper describes, on the basis of a questionnaire survey of general contractors and project management practices. They conclude that risk management is essential to construction activities in minimizing losses and enhancing profitability. Construction risk is generally perceived as events that influence project objectives of cost, time and quality. [13]

S.S. Timofeeva and D.V. Ulrikh and N.V. Tsvetkun (2017) analysed the occupational risk assessment methods recommended in the normative documents and scientific publications. The selection of methods that can be used for the assessment of risks in construction industry is conducted. According to the assessment results it is established that the electric and gas welder, bricklayer, concrete worker, carpenter are constructional occupations with the greatest occupational risks. [19]

Patel Kishan (2017) found that construction projects are initiated in complex and dynamic environments resulting in circumstances of high uncertainty and risk, which are compounded by demanding time constraints. For that each construction project itself is a complex system. Risks always exist in construction projects and often cause schedule delay or cost overrun. This study involved finding of 47 factors which are responsible for risk in construction projects. [17]

III. CONCLUSION

From the above literature review we can conclude the following things:

1. Risk management in the construction project management context is a comprehensive and systematic way of identifying, analyzing and responding to risks to achieve the project objectives. To manage the risk effectively and efficiently, the contractor must understand risk responsibilities, risk event conditions, risk preference, and risk management capabilities.
2. The lack of experience makes it very difficult to change attitude towards risk management. Nevertheless, the construction companies need to include risk as an integral part of their project management.
3. Risk Management helps you to avoid any big disaster and enhances your revenues by saving your expenses.
4. As far as the engineers concerned Lack of knowledge of arbitration has the maximum risk and other risks are material shortage, shortage in supply of electricity, poor quality of procured materials, loss due to fluctuation of interest rate, accident in site sub-contractor related problems, error in drawings, improper verification of contract documents, and competition from other companies. It is the factors which affect the whole construction project. Risk Management helps to reduce the risks affecting projects.
5. We can conclude that delays in projects are biggest risk factors, which directly affect the cost of the projects and it make over budget. By using different risk assessment methods and proper risk identification, we can remove the barricades.

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