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# Risk Assessment and Management in Building Construction Projects

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**Abstract:** Risks have vital impact on construction comes in terms of its primary objectives. Construction comes that area unit tortuous in nature, uncertainty and risks within the same will develop from totally different sources. The record of the development trade isn't acceptable in terms of header up with risks in comes. Risk management could be a method that consists of identification of risks, assessment with qualitatively and quantitatively, response with an acceptable methodology for handling risks, and so controls the risks by watching. This study proposes to use the chance management technique which has well - documented procedures for the one stop resolution all kinds of hazards presumably to occur throughout any construction project Lifecycle. The study of varied risks and their management is changing into pre-requisite for several construction comes and may considerably profit most all parties... The qualitative risk analysis is employed to analysis helps to predict severity of risks. Risk management includes identification of risks in contract documents, risk classification, risk analysis and so risk management. it's been found that severities of vital risks are calculated considering the appropriate management measures from consumer and contractors purpose of read.. the target of this study is to spot the risks that area unit caused in varied construction comes and hard the risks severity to non-public and property. The overall methodology of this study depends mostly on the survey form that was collected from varied sources. Thorough literature review has been conducted to spot the chance factors that have an effect on the performance of the development trade as a full. The form ready for the pilot survey was developed supported the relevant literatures within the space of construction risk management.

**Keywords:** Risk Management, Construction Management, Risk Assessment, Construction Projects Risk, Risk Analysis

## I. INTRODUCTION

Risk is associate degree unsure event or condition that, if it happens, incorporates a positive or a negative result on a project objective Risk Management is that the systematic method of distinctive, analyzing, and responding to project risk. RM includes maximising the chance and consequences of positive events and minimizing the chance and consequences of adverse events to project objectives. Project management is that the application of data, skills, tools, and techniques to project activities so as to fulfill or exceed neutral desires and expectations from a project.

### A. Risk Management

Risk management in an exceedingly project encompasses distinctive factors that might probably negatively impact a comes price schedule or quality baselines; quantifying the associated potential impact of the known risk; and implementing measures to manage and mitigate the potential impact . The riskier the activity is, the dearer the results if wrong call is created. Businesses would love to quantify risk for several reasons. Knowing what proportion risk is concerned can facilitate decide if expensive measures to scale back the extent of risk are excusable. It can even facilitate to choose if sharing the danger with associate degree non depository financial institution is even. Some risks, like natural disasters, ar nearly inescapable and have an effect on many folks. All selections in life involve risk. Risks can not be wholly avoided, however the selection cans be created so risk is decreased.

### B. Risk Assessment

Risk assessment is outlined during this study as a way that aims to spot and estimate risks to personnel and property wedged upon by a project. ancient risk assessment for construction has been similar with probabilistic analysis. Such approaches need events to be reciprocally exclusive, exhaustive, and not absolutely freelance. However, construction involves several variables, and it's usually tough to see relation, dependence and correlations. As a result, subjective analytical strategies that have faith in historical info and therefore the experiences of people and corporations are accustomed assess the impact of construction risk and uncertainty.

## II. OBJECTIVES AND NEED OF STUDY

The main objective of this project is to spot the key risk issue that affects the building construction comes. The target of this paper is to spot the key risk factors that associate degree result on construction method and gift an emotive recommendation for adoption to avert the threat that causes severity effect to construction project

## III. LITERATURE SURVEY

- A. *Yasser Abdelghany, A.Samer Ezeidin (2010)* This paper focuses on the analysis of the different ICJV risk environments. The related risks are analyzed into country, operating, sociopolitical and financial risks and then identified and grouped into internal, project specific, schedules, and major contract clause risks. A simplified decision support system (RAMSCO) is proposed that breaks down project risk into discrete phase systematically.
- B. *Hong-bo Zhou, S.e. M.ASCE and Hui Zhang, (2011)* Risk assessment and risk management for deep foundation pit engineering are essential for quality and safety in civil engineering owing to the needs of urban construction projects. However, uncertainty and fuzziness continue to challenge studies of the probability and consequences of risks in this area. Therefore, a fuzzy comprehensive evaluation method based on Bayesian networks (BNs) is proposed to assess the risks of deep foundation pit construction. This methodology has five main parts: modeling of BNs, determination of occurrence probabilities of risk events, assessment of consequences, calculations of risk value and membership degree of risk rating, and definitions of risk acceptance criteria. The probability of every risk event is calculated by using deductive BN techniques. Then the consequence of each event is calculated by using fuzzy analysis (i.e., statistical consequence distributions and weight coefficients of risk events are determined through the database). A fuzzy comprehensive evaluation model with a membership function is also presented, and each risk event in the deep foundation pit construction is rated. In addition, risk precautions and control measures are suggested on the basis of the risk assessment results and are applied to risk management in deep foundation pit construction.
- C. *Hariharan Subramanyan, Priyadarshi H. Sawant and Vandana Bhatt (2012)* The focus of the present research is to identify factors that influence the smooth completion of a project and develop a risk assessment model. Student's t-test, a significance test, has been applied to know the significance of test findings on the general construction industry. The risk response strategy suggested in this paper will be useful in mitigating the adverse effects of risk in project completion in the Indian construction industry.
- D. *Patel Ankit Mahendra et al., (2013)* present significant impact on construction projects in terms of its primary objectives. Construction projects which are intricate in nature, uncertainty and risks in the same can develop from different sources. The record of the construction industry is not acceptable in terms of coping up with risks in projects. Risk management is a process which consists of identification of risks, assessment with qualitatively and quantitatively, response with a suitable method for handling risks, and then control the risks by monitoring. This study proposes to apply the risk management technique which includes well - documented procedures for the one stop solution all types of hazards most likely to occur during any construction project Lifecycle.
- E. *Renuka et al., (2014)* explain infrastructure development will increase the growth of countries economy and generates the large amount of job opportunities. Hence those projects involve a large amount of investment to carry out. In view of that, if any sort of wastage (either time, resources etc) occurs that would lead to the huge monetary losses. These losses occur due to various risks associated with such mega projects. Consequently, these risks play a crucial role for the completion of project within the time schedule and planned budget. In this connection, this study mainly discusses the critical risk factors and its assessment techniques through comparative study of various international construction project.
- F. *Chaitali S.Pawar et al., (2015)* This paper proposes study of risk arises in the condition of contracts and specifications. The qualitative risk analysis is used to analysis helps to predict severity of risks. Risk management includes identification of risks in contract documents, risk classification, risk analysis and then risk control. It has been found that severities of important risks have been calculated considering the suitable control measures from client and contractors point of view. The findings of paper may be used as reference to similar construction projects in India i.e. for local clients, contractors, investors and also for Government.
- G. *Krantikumar Mhetre, et al., (2016)* Construction industry is highly risk prone, with complex and dynamic project environments which create an atmosphere of high uncertainty and risk. The industry is vulnerable to various technical, socio-political and business risks. The track record to cope with these risks has not been very good in construction industry. As a result, 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. Risk management is a process which consists of identification of risks, assessment



with qualitatively and quantitatively, responses with a suitable method for handling risks, and then controls the risks by monitoring.

- H. Aravind Kannan.P et al.,(2017) This paper 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.

#### IV. METHODOLOGY

In this paper, general focus has been created on the overall ideas of risk management. Risk identification has been finished the study of literature.

A form was developed once the known factors moving the comes. A risk assessment will be finished the help of applied mathematics analysis; analysis of variance analysis and t-test were used. Risk response might be planned on the idea of the end result of the study.

Risk management is that the last step within the method of risk management. Remedial measures to be recommended and therefore the gift knowledge to be recorded for future reference Descriptive analysis (Mean, Standard Deviation),

##### A. Differential Analysis (t-test and ANOVA)

The mean of a distribution is often understood because the arithmetic average. it's maybe the foremost familiar; most often used and well understood average. Unidirectional multivariate analysis procedure produces a unidirectional analysis of variance for a quantitative variable quantity by one issue (independent) variable. Analysis of variance is employed to check the hypothesis that many mean that square measure equal. this system is associate degree extension of the two-sample take a look at.

#### V. DATA COLLECTION

Field survey is completed to review the rife environmental within the building housing industry. the target of doing field survey is to get the opinion of field personnel with regard to varied varieties of risks related to building housing industry. For the survey, supported literature review a form is developed to get the opinion of respondent. The form is meant likelihood level of the chance prevalence and degree of impact or the amount of loss if the chance happens. Survey was distributed among the varied comes participants.

#### VI. CONCLUSIONS

The aim of this analysis was to identify the danger factors in construction comes, since risk area unit thought-about to be an important draw back at intervals the industry.

Through elaborate literature review and interview with consultants from industry, risk factors were renowned. in keeping with tool used then quantified relative importance of delay factors and demonstrate the ranking of the factors and groups in keeping with their importance level on delay.

This objective was achieved through analysis of interview out comings. in keeping with the computed relative importance indices, all factors and groups were graded and verify the foremost very important factors and groups to cause delays. the danger management technique need to be applied into any construction project at the initial stage of the project to induce most sensible factor concerning the technique

#### REFERENCES

- [1] Abdelgawad, M. and Fayek, A. R., 2010. Risk management in the construction industry using combined fuzzy FMEA and fuzzy AHP. *Journal of Construction Engineering and Management*, ASCE, Vol. 136, No. 9, pp. 10281036.
- [2] Akintoye, A.S. and MacLeod, M.J., 1997. Risk analysis and management in construction. *International Journal of Project Management*, Vol. 15, No.1, pp. 3138.
- [3] Dey, P.K., 2002. Project Risk Management: A Combined Analytic Hierarchy Process and Decision Tree Approach. *Cost Engineering*, Vol. 44, No. 3, pp. 1326.
- [4] Royer, P.S., 2000. Risk management: The undiscovered dimension of project management. *Project Management Journal*, Vol. 31, No.1, pp. 613.
- [5] Raz, T., Shenhar, A.J. and Dvir, D., 2002. Risk management, project success, and technological uncertainty. *R&D Management*, Vol. 32, No. 2, pp. 101109.
- [6] Hariharan Subramanyan, Priyadarshi H. Sawant, and Vandana Bhatt (2012) "Construction Project risk Assessment: Development of Model Based on Investigation of opinion of Construction Project Experts from India" *Journal of Construction Engineering and Management*, ASCE, Vol.138, pp. 409 -421
- [7] Li Bing and Robert L. K. Tiong,(1999) "Risk management model for international construction joint ventures" *Journal of Construction Engineering and Management*, ASCE, Vol. 125, No.5, pp. 377-384
- [8] Martins Claudia Garrido, Morano Cassia Andera Ruotolo et al. (2011) "Risk Identification Techniques Knowledge and Application in the Brazilian Construction" *Journal of Civil Engineering and Construction Technology*, Vol.2 No.11, pp.242-252
- [9] R.C.Walke et al. (2011) "An Approach to risk quantification in construction projects using EMV analysis" *International Journal of Engineering Science and Technology (IJEST)* Vol. 3 No.9, pp. 6847-6855



- [10] Scott Baker, David Ponniah, And Simon Smith(1999) “ Survey of risk management in major U.K.companies” Journal prof. Issues Eng. Educ. Pract, Vol. 125, No.3, pp.94-102
- [11] Shen L Y, George.W. C. Wu, and Catherine S. K.Ng(2001) “Risk Assessment for Construction joint ventures in China” Journal of Construction Engineering and Management, ASCE, Vol. 127, No. 1, 2001,pp. 76-81
- [12] Tiendung Le, Carlos, H.Caldes et al. “Assessing Scope and Management Risk in the Highway Project Development Process” Journal of Construction Engineering and Management Vol.135,No.9, pp.900-910
- [13] Wenzhe Tang, Maoshan Qiang et. Al (2007) “ Risk Management in the Chinese Construction Industry” Journal of Construction Engineering and Management, Vol.No.133,No.12, pp.944-956



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