Risk Modelling in Highway Construction Project using Regression and Fault Tree Analysis

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Abstract – Construction industry is considered as one of the most complex industrial sector. It is because of the reasons that construction projects involve a variety of complex process working simultaneously. Proper management of all these processes is quite challenging for the management team. Risk is nothing but the threats occur during the project life cycle. Risk may be various kinds. There are various factors which affect the occurrence of these risks. All these risk occur during the project life cycle will results in financial loss and even in stoppage of particular project. Hence in order to prevent this, proper risk management is very important. Risk management can be done only by assessing the chance of occurrence of risks. This thesis is conducting to find out various risk factors that occur in construction project using PI method and to rank them according to their priority. For that a questionnaire of five-point scale was prepared. Eight major risks were considered for the questionnaire survey. SPSS software is used for risk assessment and is done with the help of important index equation.

Key Words: Project Management, Risk Management, Risk Factors, Risk assessment.

1. INTRODUCTION

The construction industry is subject to more risks compared with many other industries due to the unique features of construction activities, such as long period, complicated processes, abominable environment, financial intensity and dynamic organization structures. Hence, taking effective management techniques to manage risks associated with variable construction activities is important for the successful delivery of a project. Risk management is the identification, assessment and prioritization of risk (defined in ISO 31000 as the effect of uncertainty on objectives, whether positive or negative) followed by coordinate and economical application of resources to minimize, monitor and control the probability and/or impact of unfortunate event or to maximize the realization of opportunities. A systematic process of risk management has been divided into risk classification, risk identification, risk analysis and risk response, where risk response has been further divided into four actions, i.e. retention, reduction, transfer and avoidance.

2. LITERATURE REVIEW

Ming-The Wang et. al. (2003) “Risk Allocation and Risk Handling of Highway Projects in Taiwan” provides analytic procedures to recognize the risk allocation of construction projects and investigate the influence of risk allocation to contractor’s risk handling decisions. This paper also investigates the effects of risk allocation and risk event conditions on contractors’ risk handling decisions because owners and contractors usually have disagreements over risk responsibilities. Mohamed Sayed Bassionyet. al. (2015) “Identification and Assessment of Risk Factors Affecting Construction Projects” tried to identify, qualify, study, assess, and quantify the factors that affect budget and time contingency. This paper focused to identify and study the factors that affect cost overrun and schedule overrun, also to develop a probability distribution charts for likelihood, cost impact and schedule impact, and to quantify the Risk assessment impact on cost and schedule. Yanjun Zhao et. al. (2011) “Forecast for Construction Engineering Risk Based on Fuzzy Sets & System Theory” introduces the fuzzy system theory to build a construction engineering risk fuzzy forecast model. Osama Ahmed Jannadiet. al. (2003) “Risk Assessment in Construction” presents a risk assessor model (RAM) that was developed & that determines risk scores for various construction activities. The model also provides an acceptability level for the risks and determines a quantitative justification for the proposed remedy.Sadi A. Assafet. al. (2006) “Causes of delay in large construction projects done survey on time performance of different types of construction projects in Saudi Arabia was conducted to determine the causes of delay and their importance according to each of the project participants. The most common cause of delay identified by all the three parties is “change order”. Ana I. Irimia-Diéguzeaet. al. (2014) “Risk Management in Megaprojects” focused on risk identification. Our purpose is to establishing the state of the art in risk management in megaprojects, systematizing the risks studied in the Literature, as well as to identify potential areas of further research. Dr. Patrick. X.W. Zouet. al. (2004) “Identifying Key Risks in Construction Projects: Life Cycle and Stakeholder Perspectives”. This research endeavored to identify key risks associated with the achievement of all project objectives in terms of cost, time, quality, environment and safety. Irjet Template sample paragraph .Define abbreviations and acronyms the first time they are
used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

3. METHODOLOGY

4. RISK IDENTIFICATION


Based on risk validation, the 60 risks were validated and out of it 28 risks were classified under project approval delay, time overrun risks, cost overrun risks, site condition risks and safety risks.

4. CONCLUSION

Innovative procurement processes shall be introduced in the future in order to reduce the adversarial risk occurring in projects. Those concepts have been developed to involve all project participants. There are basically five categories of classic risk response strategies: accepting, avoiding, monitoring, transferring, and mitigating the risk Accepting the Risk: Accepting the risk means, understand the risk, its consequences, and probability, and choose to do nothing about it. If the risk occurs, the project team will react. This is a common strategy when the consequences or probability that a problem will occur are minimal. As long as the consequences are cheaper than the cure, this strategy makes sense. Avoid the Risk: Avoid a risk by choosing not to do part of the project. This deletion of part of the project could affect more than the project-the business risk could also be affected. Changing the scope of the project might change the business case as well, because a scaled-down product could have smaller revenue or cost-saving opportunities. Risk/return is a popular expression in finance-high return on an investment, probably more risk is involved. Avoiding risks on projects can
have the same effect-low risk, low return. Monitor the Risk and Prepare Contingency Plans: Monitor a risk by choosing some predictive indicator to watch as the project nears the risk point. The risk strategy is to monitor the risk by being part of the test team. Contingency plans are alternative courses of action prepared before the risk event occurs. The most common contingency plan is to set aside extra money, a contingency fund, to draw on in the event of unforeseen cost overruns. It's important to make sure that this fund is used only for unforeseen cost overruns—not to make up for underestimating or substandard performance. Contingency plans can be looked on as a kind of insurance and, like insurance policies, they can be expensive.

REFERENCES


