

## ANALYSIS OF RISK ASSESSMENT IN CONSTRUCTION PROJECTS

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### ABSTRACT

Risk management is that the method of distinguishing, assessing associated dominant threats to an organization's capital and earnings. These threats, or risks, might stem from a large form of sources, as well as money uncertainty, legal liabilities, strategic management errors, accidents and natural disasters. IT security threats and data-related risks, and therefore the risk management methods to alleviate them, became a high priority for digitized corporations. As a result, a risk management arranges more and more includes company's processes for distinguishing and dominant threats to its digital assets, as well as proprietary company information, a customer's in person specifiable info and holding.

**Keywords:** Risk management, security threats and data-related risks.

### INTRODUCTION

Risk management could be a idea that is employed altogether industries, from IT connected business, automobile or pharmaceutical trade, to the development sector. Every trade has developed their own risk management standards; however the overall concepts of the idea typically stay a similar in spite of the arena [1-2]. One idea that is wide used inside the sphere of risk management is named the danger management method (RMP) and consists of 4 main steps: identification, assessment, taking action and watching the risks. In every of those steps, there are a unit variety of ways and techniques that facilitate handling the risks [3-4].

The following are the number of the particular edges of a preventative risk management program:

- See risks that don't seem to be apparent: several of the important risks facing a company can't be gleaned from a textbook. A comprehensive preventative risk management program leverages a team of specialists to spot and supply a deeper understanding of every kind of risks.
- Provide insights and support to the Board of Directors: Board members could realize it troublesome to spot risks outside their areas of experience and skill. Providing resources and informatory services to the Board and its committees charged with risk

management can build them higher ready to discharge their duties.

- Reduce business liability: Regulators and shareholders more and more read proceedings risk as a business liability. Reducing proceedings risk direct makes the corporate a lot of enticing investment.
- Frame regulative problems. Preventative risk management programs give larger insight into insurance, indemnity and liability problems and permit the corporate to raised focus and structure its inquiry.

### **OBJECTIVES OF THE STUDY:**

The primary objective of this project is as follows:

- To find the key risk factors contributing in the construction projects.
- To prepare the questionnaire survey for identifying the data about risks in construction industry.
- To develop recommendations, which contribute to more effective risk management in construction projects.
- To address the risk factors contributing high risk in the construction projects at various stages based on the data collected by questionnaire survey.
- To plan and take management action to achieve the aims of removing or reducing the likelihood and effects of risks before they occur in the construction projects.
- To continuously monitor potential impacts of risks, review the associated action plans, and provide and manage adequate financial and schedule contingencies for risks should they occur.

### **METHODOLOGY**

The methodology is that the general analysis strategy that outlines the approach within which analysis is to be undertaken and, among alternative things, identifies the ways to be employed in it. These ways, described within the methodology, outline the means or modes of information assortment or, sometimes, however a selected result's to be calculated. Many new methodologies area unit been utilized by several students for his or her study on risk assessment these methodologies area unit been analyzed within the literature study and supported them a strategy is been framed for this study.

In this identification of risk factors is the main objective in this thesis of risk assessment, for that collection of data is been carried out using questionnaire survey. A questionnaire is been developed using the literature study containing the major risk factors influenced in the construction industry. These questionnaire is been circulated to various personnel in the

construction sector and the data is been collected from them [5].

For further study on risk management in various infrastructure projects will be done from the risk factors obtained from the questionnaire survey will be compared to the risk factors which will be obtained during the construction of real time projects.

A risk assessment is not about creating huge amounts of paperwork, but rather about identifying sensible measures to control the risks in workplace. Risk assessment is to be carried out through a questionnaire survey by correlating the views of various respondents on the various factors considered. The collected data is then analysed and among the considered factors which factor contributes more risk in project scheduled acceleration in a construction project is been established [6].

The ranking of the risk factors has to be done using RII method. This ranking make it possible to compare the relative importance of the factors considered as perceived by the group of respondents. The RII of all factors should be used to assess the overall rankings in order to give an overall picture of the factors that impact in infrastructure projects.

The formula for calculating relative importance index is given below,

$$RII = \sum X_i Y_i / Z_i$$

RII = Relative Importance Index

$X_i$  = number of responses to the factors  $Y_i$  = the value of rating

$Z_i$  = total number of responses to the factor

A chart showing the comparison between various factors considered is also been formulated. This data will utilized in construction of various infrastructure projects further.

### **Data analysis through statistical model**

The samples obtained through the questionnaire survey were analysed using statistical data models and the results are implemented in real time infrastructure projects.

### **METHOD OF SURVEYING**

The general methodology of this study relies largely on the survey questionnaire which will be collect from the engineers and chief persons working in metro rail project.

### **Risk quantification**

Risk Qualification involves evaluating risks and risk interactions to assess the range of

possible project outcomes. It is primarily concerned with risk events warrant response. It is complicated by a number of factors including. But not limited to:

- Opportunities and threats can interact in unanticipated ways.
- A Single risk event can cause multiple effects, as when late delivery of a key component produces cost overruns, Schedule delays, penalty payments, and a lower quality product.
- Opportunities for one stakeholder (reduced cost) may be threats to another (Reduced cost).
- The Mathematical techniques used can create a false impression of precision and reliability.

### **Tools and techniques for risk quantification**

- Expected monetary value. Expected monetary value, as a tool for risk quantification, is the product of two numbers
- Risk event probability-an estimate of the probability that a given risk event will occur.
- Risk event value-an estimate of the gain or loss that will be incurred if the risk event does occur.
- Statistical sums can be used to calculate a range of total project costs from the cost estimates for individual work items. The range of total project costs can be used to quantify the relative risk of alternative project budgets or proposal prices.
- Simulation. Simulation uses a representation or model of a system to analyze the behavior or performance of the system. The most common form of simulation on a project is schedule simulation using the project network as the model of the project. Most schedule simulations are based on some form of Monte Carlo analysis. This technique, adapted from general management, “performs” the project many times to provide a statistical distribution of the calculated results. The results of a schedule simulation may be used to quantify the risk of various schedule alternatives, different project strategies, different paths through the network, or individual activities. Schedule simulation should be used on any large or complex project since traditional mathematical analysis techniques such as the Critical Path Method (CPM) and the Program.

### **Risk response development**

Risk response development involves defining enhancement steps for opportunities and responses to threats. Responses to threats generally fall into one of three categories:

- Avoidance-eliminating a specific threat, usually by eliminating the cause. The project

management team can never eliminate all risk, but specific risk events can often be eliminated. Mitigation-reducing the expected monetary value of a risk event by reducing the probability of occurrence (e.g., using proven technology to lessen the probability that the product of the project will not work), reducing the risk event value (e.g., buying insurance), or both. Acceptance -accepting the consequences. Acceptance can be active (e.g., by developing contingency plan to execute should the risk event occur) or passive (e.g., by accepting a lower profit if some activities overrun) [7].

### **Tools and techniques for risk response development**

- **Procurement:** Procurement, acquiring goods or services from outside the immediate project organization, is often an appropriate response to some types of risk. For example, risks associated with using a particular technology may be mitigated by contracting with an organization that has experience with that technology. Procurement often involves exchanging one risk for another. For example, mitigating cost risk with a fixed price contract may create schedule risk if the seller is unable to perform. In similar fashion, trying to transfer all technical risk to the seller may result in an unacceptably high cost proposal.
- **Contingency planning:** Contingency planning involves defining action steps to be taken if an identified risk event should occur
- **Alternative strategies:** Risk events can often be prevented or avoided by changing the planned approach. For example, additional design work may decrease the number of changes which must be handled during the implementation or construction phase. Many application areas have a substantial body of literature on the potential value of various alternative strategies [8].
- **Insurance:** Insurance or an insurance-like arrangement such as bonding is often available to deal with some categories of risk. The type of coverage available and the cost of coverage vary by application area.

### **CONCLUSION**

As far as India is concerned risk management is still a new word in the construction sector and this should be changed as soon as possible. Currently the Government of India has proposed a risk rating system will help the developers to develop projects at a faster pace by taking quick decisions. Each rating agency will have its own methodology to rate projects. The system will help government to develop a strategy to mitigating risk. This

will encourage more response from developers and investors for public-private partnerships projects. It could make the bidding projects more competitive. The system will enable bankers to take quick decisions for lending finances, which could lead to the financial closure of the project at a faster pace. Third party risk rating would certainly raise critical points, which are not normally raised during finalization of project

The following are the conclusions from this thesis work

1. Shortage of skilful workers is the major risk faced by almost all the companies. This is because; the skilled workers are migrating between companies very often due to the high demand in the market.

2. Since real estate, construction sector are in the boom side, construction companies are in move to make profit as soon as possible in current wave itself; but this creates tremendous pressure to the workers to complete the project in a very short span.

3. Sub-contractor related risks are also high, since most of the sub- contractors are not able to meet the standards of the main contractor and the client due their size of work. Thus from the above points the management risk has been found to be the critical risk from this survey

4. Delay in the project is also one of the main risks, but this delay is looped with various others factors and risks directly or indirectly.

5. The risk of competition from other companies constitutes major problem to the small & medium sized companies. Due to the policy of the Indian government that 100% FDI is allowed in the construction sector which allowed foreign companies to enter the market, created a stiff competition to the local companies both technically and financially.

6. Inflation rate is very high in India and increasing proportionately with time, this causes the increase in prices of materials like cement, steel which in turn causes financial risk to the land developers and construction firms

7. Political risk is substantially very low for the large firms when compared to other risk.

8. Legal risk is also very low, but the implementation of court directive is not proper; this was the complaint seen from this survey.

9. Large companies are accepting that there are few environmental effects due

to their project, but says that it is a global phenomena and it cannot be nullified, but only can be reduced.

10. Overall market, management, and the financial risks are high when compared to other risks.

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