RISK MANAGEMENT ANALYSIS ON COCHIN METRO RAIL PROJECT

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Abstract – The Construction industry sounds to be challenging to the stakeholder attached to any project every time. Various types of risks are involved in the construction project especially in Infrastructure projects. If these risks are not known then the contractor is going to face a lot of problems. So, there is a need to study about the risk management by the students in order to gain the knowledge and to implement in site, because of the various types of risks involved in the infrastructure project there will be loss of life, cost overruns and delay of the project. Study of risk management analysis has a larger scope not only in the construction industry, human life and business sectors too. In the Metro rail project there are various types of risks involved. Financial risk, Contractual risk, Labour risk, Political risk, Client risk, stakeholder risk etc. but this study mostly concentrate on the material risks, labour and resource risks. The main objective of this paper is to study Various types of risks are involved in the construction project especially in Infrastructure projects and analysing the factors influencing risk management in construction projects.

1. INTRODUCTION

Infrastructure Construction projects are unique in character and do not lend themselves to standardization .The construction project of dynamic nature, with many seasonal and cyclical ups and downs. Hence, each construction project requires a lot of care in handling. Also, construction activity consists a number of agencies i.e. the client, consultant and the contractor. In order to establish the duties, obligations, rights, responsibilities among the various agencies, a contract is required to be made between them which will establish a mutual relationship to do a work.

Infrastructure is vital to a nation's economic growth and is considered to be the backbone on which the society is built. Poor transport and communications infrastructure inhibit participation of developing countries in global production networks (Limao and Venables, 2001). Funding constraints to construct and maintain such infrastructure has encouraged the use of innovative mechanisms like Public- Private Partnerships (PPPs)

PPPs have the advantage of private sector operating efficiently (using technology and management) and thereby reducing costs. However, public involvement is needed to ensure this happens such that it benefits the society. Therefore, improvement in transportation infrastructure through PPPs is the way forward (Foster and Briceno - Garmendia, 2010).

This study mainly focuses on the various risk parameters involved in the infrastructure projects. As every project has risk in its own nature, to resolve or quantify the risk we have taken a case study on Cochin metro rail project. Risk management aims to be an effective and cost-efficient way of reducing or even eliminating the formerly presented events. The study describes how the utilization of the resources and labour in infrastructure project helps to complete the work in time and without cost over runs. The risk arises from the organization is more compared to the technical factors. These risks are removed by proper implementation of risk management in the organization. Political governance is another method which is used to eliminate the risks in the infrastructure projects

Transport situation in most Indian cities is rapidly deteriorating because of the increasing travel demand and inadequate transportation system. Indian cities of all sizes are facing the crisis of urban transport. Large cities are facing an unprecedented growth of personal vehicles (two wheelers and cars) and in medium and small cities different forms of intermediate public transport provided by informal sector are struggling to meet the mobility demands. While researches show that the ideal modal share of public transport should be around 70%, however it is in tune to only 35%–40% in India's metro cities. Growing cities, growing population and growing traffic has invariably called for a shift from private modes of conveyance to public transport. In Cochin city the population exceeds 2.1 million that's why metro rail project has taken up. The introduction of metro rail service in Cochin city will definitely change the transportation system in the city. The length of approximate13.4 km to be taken up in the phase 1. Total budget of the KMRL project is 55.373 billion.

Risk management analysis on several infrastructural projects is referred and a case study analysis of a Cochin metro rail project is taken. The study mainly involves in identifying and quantifying the several risks in the project.

Risk is defined as any action which will affect the achievement of project objectives. Risk management is a technique which is used in many other industries from, IT related to business, automobile, pharmaceutical industry, to the construction sector. Risks and uncertainties are more inbuilt in the construction industry compared to the other industries. Many industries have become more proactive about using risk management techniques in project. However, with respect to the construction industry, the same is not used commonly. Typical construction-related risks are unsafe working practices and failure costs, which are ten to thirty per cent of total construction costs.

Risk management provides support for attempts to gain better control over a project when it comes to time, cost, quality, scope and organization. Risk management can help to promote progress of the

activities within a project, instils confidence in the project, promote communication within the project and support the decision-making process within a project.

Construction of infrastructure remains a high risk activity. Complexities and uncertainties are endemic in large infrastructure construction projects. Risk management aims to be an effective and cost-efficient way of reducing or even eliminating the formerly presented events, which caused by uncertainty and risk. Risk is an integral component of any project. Risk is present in all projects irrespective of their size or sector. No project is totally free from risks. If risks are not properly analysed and strategies are not implemented well to deal with them, the project is likely to lead to failures. All steps in the risk management process should be included to deal with risks, in order to implement the process of the project.

Risk management analyses for infrastructure projects are mandatory now a days because unlike other industries it not only deals with the loss of money but also deals with the loss of life. In order to complete the project in the given time the assessment of risks associated with the labour and resources of the project are mandatory. Labour and resource risks come under the category of construction risks.

2. LITERATURE REVIEW

Guangwu Liu, Fengxia Luo, Gang Zeng (2013) have done research on safety risk management on metro rail project (Received 26 June 2013; revised 12 February 2014; accepted 24 February 2014). Based on the international vulgate safety risk managing theory, the Guangzhou Metro Corporation (GMC) summarizes the standard system of safety risk management in metro rail transit project, integrating with criterion files about project on safety risk management promulgated by the Ministry of Housing and Urban- Rural Development of the people republic in China (MHURD). Currently, metro rail projects are growing rapidly in China. According to stats, there are 15 cities operating metro rail transit project up to May 2013 with the distance of 2416km. In these 15 cities Beijing, Shanghai, and Guangzhou are the top 3 cities that have operating mileage in the world. Simultaneously, there are 36 cities developing metro rail transit projects with a total distance of 1370km, the total budget of the project will be 1200bn Yuan. According to media reports, from 1999 to 2010, 92 accidents happened in metro rail transit projects, 68 people died from these accidents and direct economic losses stood at least 4.1billion. Those accidents occurred because traditional safety management pattern was dependent on peoples experience and thus hard to cope with serious safety situation .GMC thought that it is time to start research on safety risk management system. Since 2005 GMC started research on safety risk management as the lead of Chinese Metro Corporations. In November 2010 MOHURD authorized GMC to carry out the pilot project of “metro rail transit construction risk evaluating and research” by utilizing the international common risk management theory. Usually the risks are divided into two categories according to international common risk management theory. Those are Technical risks and Planning risks. Those two risks are probably main reasons for cost overruns and time overruns. From the research GMC summarized an

effective system of safety risk managing i.e., "Six times evaluating, six party management and a Unified platform."

The safety risk management system "Six times evaluating, six party management and a Unified platform" is based on 3aspects. Those are International common risk identification, evaluation and management theory, method or tools.

There into "six times evaluating" means preliminary evaluating and the lasting risk identification and evaluating throughout the life cycle. "Six party management" means all parties relevant to the project should participate in safety risk management such as the government, the owners, the design institute, construction companies, the supervision companies and the third party monitoring companies ."Unified Platform" means the online GM safety risk coordinated disposal platform.

Sai Krishnan.R (April 2016) have done research on risk identification and analysis in procurement of specialized items in metro rail projects. The demand for public transport system is growing rapidly by every year. This problem has severe effect on urban eco- system. For encountering this problem government has introduced new technology i.e., Metro rail project. Effective procurement of items plays an important role in successful completion of a metro rail project. More risks were encountered when the items were treated as specialized items. The impact of risks will be even more in the case of fast tracking of a project like a metro rail project because of the high quality and safety measures involved. Proper risk management analysis plays an important role to control cost overrun and time overrun of a metro rail project. For the purpose of the study, procurement of 5 items carried out in Cochin metro rail project (KMRP). In this research paper risks are identified through document review and discussion with procurement experts. In present scenario the number of metro rail projects are increasing that's why we should concentrate on risks in procurement of specialized items in metro rail projects. The nature of risks were also analysed based on their applicability to the items considered. Based on analysis carried out, the procurement of specialized items in metro rail projects are identified and measures were taken to minimize the risks associated with procurement of items in metro rail project. Based on findings of this research paper mitigation measures has been taken to reduce the risks involved in procurement of items, if the process is completed systematically which is explained by Sai Krishnan.R will enable to reduce the cost overrun and schedule delays in metro rail projects .

3. METHODOLOGY

Methodology involves the following steps:

Reviewing prior literature about mobile application technology in Construction projects for identifying the gap in the literature.

Preparation of a questionnaire to gather the information about adoption of mobile application technology in construction project processes in real estate projects.

Floating Questionnaire directly to the respondents.

Analysis of the questionnaire survey, to identify the risks and analyse the risk management strategies in Cochin metro rail project.

The questionnaires are to be completed by middle management authorities such as project managers involved in the construction project processes

4. RESEARCH METHODOLOGY

A Case Study approach is taken to study the risk management analysis on Infrastructure projects. Case study is an intensive study of a single group or community. It provides an avenue for investigating details in a specific context and is also often used to provide context to other data.

Transverse case study is being taken to study the risk management analysis on Infrastructure projects based on the design. Qualitative approach of case study is taken to analyze the risks in the Infrastructure projects. From the data collected we are going to assess the likelihood and probability of the risk that are going to occur from each activity in the particular Infrastructure project.

Qualitative Risk Analysis determines the importance of addressing specific risks and guides risk responses. It helps to determine the likelihood and the potential effect of the risks on the project objectives. It provides a quick and clear picture of risks and is easy to understand. There are several techniques while performing the Qualitative risk analysis to determine the Probability and Impact of risks.

Risk Rating scales is been selected to analyse the risks in Infrastructure projects. In this technique QRA Sheet was used which consists of identified risks classified in to various types requiring a subjective response on the probability of its occurrence on a 5 point scale of Very low, low, medium, high, very high and on the impact of these risks again on the same 5 point scale.

The data collected from the Risk rating scales is been put in to the SPSS software. From the scales the probability is extracted and from the probability mean values are taken from the each activity, these mean values are taken as inputs in the SPSS software to observe the significance of risk before taking the control measures and after taking the control measures of the elements in the activity.

5. CONCLUSION

This research was carried out to study the Risk management analysis on the Cochin metro rail project. The study involved through the review of numerous literatures and articles which are published in India and abroad which focuses on risk management analysis of various infrastructure projects as well as metro rail projects. The result of the study is specific to Indian construction industry.

Since construction projects are complex in nature and context specific so it is very difficult to find out the exact information required to investigate the risk management strategies in the construction progress. But based on the previous work experience the contractors firm prepares the risk charter before. The entire literature focuses on how the risk management analysis has been done on the metro rail projects and infrastructure projects inside & outside India.

There is a huge scope for the construction of metro rails in India as it is a second most populous country and foremost developing country in the world. In every work there will be certain amount of risk especially in infrastructure projects there will be more number of risks and uncertainties because of its scope and cost.

This study involved the unstructured interview method as the construction scope is large. We had taken interviews of topmost employees who are associated with the Cochin metro rail project. On the basis of the responses received we have given relative importance index scale based upon this the analysis have done which completes the overview of the risk management analysis in the Cochin metro rail project

This study reveals how the construction industry has taking the care of risk management in infrastructure projects. As every coin has two sides, risk is also having two sides negative and positive. In this research we studied only about negative risks. This study also reveals how the risk management analysis has to be done and how they are affecting the project.

The study of Risk management analysis is an on-going research work in order to identify the new strategies to implement effectively in the construction industry especially for the infrastructure projects as the scope and the cost overruns are huge.

6. REFRENCES

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