

Risk Identification & Applying Risk Management Technique in Construction Project

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Abstract— Construction industry is one of the most important industries in our country. In construction industry every project is unique and complex so risk comes from various sources so risk management is important in every project make successfully complete. First literature review has been made and then identified risk factor after generating risk model for how to mitigate of risk factor in construction project.

Key words: Risk Identification, Risk Management Technique, Construction Industry

I. INTRODUCTION

In recent years, construction industry has developed rapidly in big cities of India. Construction industry 40% to 50% of India's capital expenditure on projects in various sectors such as highways, roads, railways, energy, airports, irrigation, etc. and is the second largest industry in India after agriculture. It accounts for about 11% of India's GDP. [1] Construction industry has a vital role in the competitive delivery of goods and services by the rest of economy. Also construction sector is a major employment driver, next only to agriculture. It is provide large number of opportunities in the field of building, civil engineering, offshore structure and the process plant industry. 250+ ancillary industries such as cement, steel, brick, and timber and building material are dependent on the construction industry.

A. Facts of Construction Industry

The construction industry has a long history. Housing has been built ever since humans left caves and the construction project as a business branch has probably been around since before the pyramids. There have always been considerations about uncertainties and risk. [2] Risk is the probability that an unfavorable outcome will occur. The process of measuring risk by risk management and then manages the risk by developing various strategies.

Risk management used in all industries like IT related business, automobile or pharmaceutical industry, construction industry, etc. each and every industries have their own risk management standards, but the general concept of risk management remain same. Risk management is most important factor for successful project. Risk management is not hard to apply in construction industry.

The construction industry is exposed to greater risks in comparison with other industries. The construction industry operates in a very uncertain environment where conditions can change due to the complexity of each project, where uncertainty comes from various sources. In industry various risk like technical, political business risk, design risk, financial risk, management risk, technology risk, etc. The track record to manage 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. [3]

Project risk has positive and negative effects on project objectives. There are different causes of risks in construction such as size, organizational and technical complexities, and speed of construction, location of the project, technology being used and familiarity with the work. [4]

Construction projects are unique and very complex, where risk comes from various sources. Risk management will not remove all risks from the projects. Risk analysis and management techniques are rarely used by construction industry due to lack of knowledge and expertise. Now-a-days people are aware for applying risk management strategies before starting projects. Thus risk management need arises. Risk management techniques are tool for discovering risks and then reducing and managing those risks.

B. Need for Study

Construction project require high value and huge resource of men, material, machinery. In major project involves heavy investment, require higher level of technology need of effective management of resource.

Constructions conditions vary from region to region, project to project, time to time. Due to certain obstacles and problems project can face serious issue such as quality requirements, cost overruns and uncertain delays in project. Due to such unseen hurdles project face a lots, which in turns required to address through some techniques and or some management skills? Here author as takes a charge to identity and resolution such risk factor by identify them by risk management techniques.

C. Aim of Study

The aim of this research is study types of risk involve in commercial and residential project (in Ahmedabad city) and its practices of risk management and to prepare risk management model for effective implementation on project.

D. Objectives

To fulfill the above mention aim of the research work the following objectives are farmed,

- 1) To study risk and risk management process and its importance in construction industry.
- 2) To identify various risk related with construction projects.

E. Scope of Work

Risk management used in all industries. Each and every industry has own risk management standards. In this research is to uncover how risk management is carried out in particular one commercial project in Ahmedabad.

II. LITERATURE REVIEW

A. A review of risk management process in construction projects of developing countries

Study: This paper shows construction project risk managements in developing countries specifically on risk management process. In construction perspective, risks are generally considered as incidences that influence the principal objectives of a particular project (time, cost, quality). This literature review aims at discovering the frequently used techniques in risk identification and analysis. Most techniques used to identify risks in developing countries are Checklists, Interviews with experts, Past experience, Brainstorming. It also attempts to identify response to clarifying the different classifications of risk sources in the existing literature of developing countries, and to identify the future research directions on project risks in the area of construction in developing countries.

B. Analysis of major risks in construction projects

Study: Risk management is thus in direct relation to the successful project completion. Project management literature describes a detailed and widely accepted risk management process, which is constructed basically from four iterative phases: risk identification, risk estimation, risk response planning and execution, often managing the risk management process are included. Therefore, examined the awareness of professionals in construction industry of the various types of planning techniques and tools used on construction sites, Questionnaires were administered on selected building professionals (Project Managers, Engineers, Architects), and Contractors and Sub-contractors directly involved in construction work on sites in planning and the use of planning tools and techniques as major tools for successful project execution. Risk assessment is a technique that aims to identify and estimate risks impacted upon by a project.

C. Risk Management in Construction Industry

Study: Objective of the paper is to study aspects that are more vital for the success of the completion of the project and highlight those pitfalls that increase the risks of the project. Construction industry has changed significantly over the past several years. Construction projects are complex and dynamic so it produces 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. 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. Risk management is a technique that should be applied within an industry to achieve the goals of the industry.

D. Risk Management in construction industry

Study: By adopting risk management, saving potentials can be realized in construction projects. For this reason, for project managers as well as real estate developers, a

consideration of the risk management process is worthwhile. Construction industry is highly risk prone, with complex and dynamic project environments creating an atmosphere of high uncertainty and risk. The aim of this research is to identify and evaluate current risks and uncertainties in the construction industry through extensive literature survey and aims to make a basis for future studies for development of a risk management framework to be adopted by prospective investors, developers and contractors in Pakistan. There is low awareness on the functional use of construction planning tools and techniques, and recommended that the use of the construction planning tools and techniques should be applied on all building project.

E. Risk Management in Construction Projects of Developing Countries

Study: Risk is defined as an uncertainty of outcome, whether positive opportunity or negative threat, of actions and events. Risk management includes identifying and assessing risks and then responding to them. Managing risks in construction projects has been perceived as a very important management process so as to accomplish the undertaking goals as far as time, cost, quality, safety and environmental sustainability. The implementation of risk management system in construction projects must be oriented towards the progress of the project success. This research found that these risks are mainly related to contractors, clients and designers, with a few related to government bodies, subcontractors/suppliers and external issues. An effective risk management process encourages the construction company to identify and quantify risks and to consider risk containment and risk reduction policies. Construction companies that manage risk efficiently enjoy financial savings, and greater productivity, improved success rates of new projects and better decision making this research also found that these risks spread through the whole project life cycle and many risks occur in more than one phase, with the construction stage as the most risky phase, followed by the feasibility stage.

F. Classifying key risk factors in construction projects

Study: Paper describes, risk Management is the core of project management. Construction projects are characterized as very complex projects, where uncertainty comes from various sources. The formal risk analysis and management techniques are rarely used by construction industry due to lack of knowledge and expertise. Case studies have shown that this classification covers the most key risks that should be taken into consideration in a risk management plan and the key includes Planning, Environmental, Funding Approval, Project Management, Engineering, Structural Systems, Cost Estimating, Scheduling, Budgeting Controls, Real Estate/Right of Way, Construction Management/ Oversight, Constructability /Contractor, Risk Facilitation. In this paper, the most effective key risk factors which have a significant effect on construction projects scope are identified and classified.

G. Risk management in construction projects as per Indian scenario

Study: Construction industry is highly risk prone, with complex and dynamic project environments creating an

atmosphere of high uncertainty and risk. In this paper, at the outset, general focus has been made on the general concepts of project risk management. A questionnaire was developed by going through literature on construction risk management. Generally construction risks are external risks and internal risks; while some other categories curtail risks as political, social and safety risk etc. several factors expose projects to normal than higher risk like factors are history, management stability, staff expertise and experience, team size, resource availability, time compression and complexity. Risks can be associated to technical, operational or business aspects of projects. Paper categorized risk into technical risks, logistical risks, management related risks, environmental risks, financial risks, socio-political risks. Eliminate risk by questionnaire survey. The respondents have revealed that these practices cause the problems of delays, low quality and low productivity in projects.

H. Risk Management Practices in a Construction Project – a case study

Study: This master thesis presents an application of risk management in the early stage of a project life cycle of a construction project. In order to examine how risk and risk management process is perceived a case study of a school project was chosen. Moreover, based on the conducted interviews, the research presents how risks change during a project life cycle. All analyses are based on a theoretical background regarding risk, risk management process and project life cycle approach in the construction sector. Risk management process consists of four main steps: identification, assessment, taking action and monitoring the risks. In each of these steps, there are a number of methods and techniques which facilitate handling the risks, methods and techniques are described in this paper. Past experience and discussions were the most commonly used techniques to identify potential risks. By applying a simple method, it is possible to identify potential risks in an easy way. Moreover it gives possibility to detect which of the identified risks has the biggest impact on time, cost and quality. Those risks should be eliminated or mitigated by taking an appropriate action. The research showed that the most common action was risk mitigation.

I. Systematic risk management approach for construction projects

Study: Risk is inherently present in all construction projects. From beginning to end, the construction process is complex and characterized by many uncertainties. Construction projects fail to achieve their time, quality, and budget goals. The construction risk management system model is a logical substitute for the traditional intuitive unsystematic approach currently used by most contractors. The influence diagramming technique and Monte Carlo simulation are used as tools to analyze and evaluate project risks. The logical extension offered in this paper is the systematic analytical approach starting with risk identification and its mapping, probabilistic risk analysis and evaluation of significant risks, and the development of alternative risk management strategies. Alternative risk management strategies are suggested. Such strategies include: risk avoidance, risk transfer, risk retention, loss reduction, and risk prevention and

insurance. The main objective of this paper is to introduce a new risk model entitled Construction Risk Management System. The proposed model provides a formal, logical, and systematic tool that helps contractors in identifying, analyzing, and managing risks in a construction project.

J. Risk management in construction industry

Study: The risk management concept is relatively new to the construction industry. It is necessary to identify all risks involved at all the stages of the project so as their assessment and analysis can be done accordingly. There are various methods to identify risks, depending on type of project. Different stages of risk management process have different methods. The aim of each organization is to be successful and risk management can facilitate it. However it should be underlined that risk management is not a tool which ensures success but rather a tool which helps to increase the probability of achieving success. Risk management is therefore a proactive rather than a reactive concept.

K. Assessment of risk in construction industry

Study: In modern society, the construction industry has been defined as a dangerous profession. Construction objects are unique and built only once and risks raises from a number of different sources. Managers need to ensure delivery of projects to cost, schedule and performance requirement. Risk assessment is defined in this study as a technique that aims to identify and estimate risks to personnel and property impacted upon by a project. Paper described types of risk like construction risk, design risk, environmental risk, financial risk, management risk, political risk, procurement risk, sub-contractors risk, technology risk. Different types of risk impact on business failure, the risk of project financial losses, the occurrences of major construction accidents, default of business associates and dispute and organization risks. It is desirable to understand and identify the risks as early as possible, so that suitable strategy can be implemented to retain particular risks or to transfer them to minimize any likely negative aspect they may have. Methodology of this study largely based on the survey questionnaire which will be collected from the local building contractors of different sizes by mail or by personnel meeting. Author finalized risk rating from 1-5 after survey. The study is focused on concepts of risk management, development of a survey questionnaire and suggestions related to risk management practices in construction industry of India. This approach provides a more effective, accurate and organized decision support tool.

III. CONCLUSION

Risk management process rarely use in construction industry due to the lack of experience and knowledge in the area. Studying this research papers, we are able to find out different type of risk factors in construction industry. Also exploring risk management process and their method. Help of risk management method how to reduce risk and improve time, cost, and quality of construction project.

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