

RECOGNISANCE AND APPRAISAL OF RISKS IN CONSTRUCTION SECTOR

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Abstract: India has seen huge growth in the infrastructure and construction sector in the recent times. With the growing size of the construction projects and the finances related to it we also need to consider the risks related. Hence the risk management component of project management comes into the scenario. These risks can cause losses that lead to rise in costs, time delays and lack of quality of projects. Risk management deals with identification and mitigation of risks in construction projects and aids in timely and in budget completion of projects. Risks are always in the future and when it occurs may lead to progressive or destructive influence on the project. Effective management of project is required by using the techniques of project management which involves project risk management as an important component through the various phases of the project, in order to manage risks and reduce time-cost overruns and quality and safety concerns.

Keywords: Risk Assessment, Risk Management, Risk Identification, Construction Projects, India

1. INTRODUCTION

Risks can be defined as an event that negatively affects the project aims, which are:

- 1) Time and Schedule
- 2) Cost
- 3) Quality of work

A risk is nothing but a situation. Risks are ignored by construction contractors and consultants while considering bids and tenders. Project risk management is broadly recognized as one of the most critical procedures and capability areas in the field of project management. Risks are critical to a project as every critical activity is related with a risk.

Also, the numerous risks arising from a task is directly proportional to the number of people working on it. Mismanagement is one of the many sources of risk. Risk mitigation depends a lot on the co-ordination of work among different people on the project. So certainly, less the number of people working on a project, less is the chance of the risk taking place.

Nowadays, nearly all of the big scale projects are sublet to sub-contractors, and therefore risk assessment and mitigation has become more and more difficult. As a developing country, India has not concentrated on risk management. This study wishes to better understand the risk identification process and other risk processes. It has already been recognized that a clear understanding of the risks borne by each member leads to better risk allocation. The aim of this study is to find means of identifying risk management and other processes that can be utilized and to make new recommendations on the use of these risk management methods.

2. HOW IS RISK ASSESSMENT APPROACHED IN THE CONSTRUCTION INDUSTRY IN INDIA

This study was done with respect to the surveys and observation of management techniques used in today's construction industry in India. Every project has big significant events or milestones with respect to cost and time which are pre-marked by the management at the start of the project. They are tracked frequently. Project managers use these indicators as pointers to risk mitigation. They look out for any negative cost influence or delays in activities of these milestones. Now in most of the cases, these milestones are not met. The key reason for that is the approach of the project manager towards the pertinent risks. Their attitude is of the wait and watch type. They respond only after they find themselves in a fix, as opposed to being proactive and taking required steps to prevent the risk from taking place. There is a necessity of a whole system to be in place, so before any activity takes place, all possible American Journal of Civil Engineering 2013; 1(2): 64-67 65 risks are identified and acted upon.

3. RISK IDENTIFICATION AND APPROACH TO RISK MANAGEMENT

Risk identification is an iterative process that includes the project team, stakeholders and other managers affected by or who affect the project, and finally outside individuals who can make a statement on the completeness of the risk identification based on their similar experiences.

The challenge lies in identifying beforehand all the risks that you might face so that the project team is well prepared and ready to mitigate it systematically. While it is a well-known fact that risk identification is a step by step procedure, i.e. new risks might appear only when the project reaches a certain level, this is exactly where analysis of historical data comes into play. The project

team has to collect all probable relevant data of former projects and take into account all the similar risks that can be linked even remotely. This can be completed with the help of industrial checklists.

By identifying risks at an early step of planning a construction project or a tender and assessing their relative importance, the project management can be adapted to decrease the risks and allocate them to the parties best able to control them or absorb them should they occur. Studies should be carried out early in the life of a project, well before decisions are made to continue with the project. Risk Management can be classified into two main ways: 1) Informal approach & 2) Formal approach

3.1 Informal Approach

In this approach, risks are mitigated as and when they arise. These risks are not predetermined. The main aspect here is that no preparation is done on collecting any data for risk identification.

One of the most broadly used techniques in the informal approach to risk management is the provision of contingency funds. There are two main forms of contingency funds: lump sum contingencies and percentage contingencies.

Here, the project depends greatly on the on-site and the sub-contractor teams. Another drawback is that discussions and brainstorming at all stages becomes a necessity.

Table - 1. Pros and Cons of the Informal approach towards risk assessment

PROS	CONS
a) Economical in some cases	a) You need an experienced and faithful execution team
b) You don't employ special teams to collect any data or identify risks	b) Discussions at all phases might be very time consuming
c) Could be useful in a project including new or unusual risks	c) Correct selection of persons for brainstorming must be done
	d) Dearth of objectivity

3.2 Formal Approach

Here at the start of the project the project management sits down and chalks out all the probable risks that are most likely to come up during the course of the project. All the risks likely to come up in the worst case situation are predicted, and proper solutions are discussed regarding that. In this method it is viable for a company to have a set of industrial data that has been collected by experience over the years in the form of checklists.

Table - 2. Pros and Cons of the Formal approach towards risk assessment

PROS	CONS
a) Objectivity.	a) It may be expensive.
b) It saves a lot of time as the management is ready to mitigate the risks.	b) It takes up a lot of resources at the commencement of the project
c) Probabilities of failure are low.	

4. IMPORTANT TOOLS/ASPECTS IN RISK IDENTIFICATION AND ASSESSMENT

4.1 Work Breakdown Structure

Before the start of the project all tasks are listed, broken down into manageable subtasks & the schedule is prepared via MS Project or Primavera. It breaks down activities into smaller and more specific sub-tasks which gives an exact idea of what needs to be done and the extent of resources to be spent on that task. It can have as many levels as probable. A WBS with the schedule is imperative in the risk identification predominantly in an industrial project involving structural steel. The WBS in the schedule can be used to create a BIM or VDC (Virtual Design Construction) video which would give a clear idea of the activities to be achieved in a chronological order.

4.2 Product Specifications

Product Specifications is a literature given to the contractors by the owners which gives a detailed description on how the product is to be implemented. There are additional or new (other than the common ones) risks for products which have predominantly different specification.

4.3 Risk Matrix

A project manager with the assistance of a specialist should create a matrix that lists out all those risks which may have a significant cost & time impact.

4.4 Resource Plan

In this paper resources mention to men, materials & machinery. Resources are the Achilles heel of all the construction procedures. In India there are more risks rising out of the lack of or mismanagement of resources rather than the activities themselves. Hence while brainstorming it is very essential to assign the activities just the right amount of resources required.

5. METHODOLOGY

To achieve the objectives of this research, questionnaires were deemed to be the most effective tool for collecting information. These queries helped identify any projects that should definitely not be undertaken by the parties and those which, although risky, should be examined further after a more rigorous examination of the potential sources of risk. This study was carried out based on a literature review and a questionnaire survey. The data were gathered through questionnaires, which were distributed through postal and electronic mailing to particular groups of 32 respondents (mostly people who work for construction companies/ firms who enjoy a leading role in planning and construction management, e.g., project managers, general managers, civil engineers, site managers, site engineers, supervisors) from government, construction and consulting companies and firms in the defined area of study.

6. ANALYSIS AND DISCUSSION

Three Non-Parametric Tests were conducted with the aid of questionnaires & their results were as follows:

6.1 The Most Preferred Method of Risk Identification by the Indian Construction Players

Table - 3. Result of the questionnaire survey

Method used for Risk Identification	Mean	Rank
Brain storming sessions	3.56	1
Analysis of historical data for similar projects	1.09	2
Use of industrial checklists	1.35	3

The results show that brain-storming sessions were the most important method that contributed to identifying the risks of a project. Brain-storming sessions and analysis of historical data for similar projects were found to be the most preferred methods of risk identification in the Iranian construction industry. However, it was recommended by the respondents that these practices led to informal risk identification.

6.2 The Relative Importance of Risk Identification Processes

These results are presented based on their mean value (the average indexes). The mean for some processes specifies that time management and cost management have affected the process of identifying the risk.

Table - 4. Result of the questionnaire survey

Risk Identification Procedure	Mean Rank	Rank
Is the risk identification process completely integrated with cost management and time management processes and the project office?	4.3812	1
Does documentation exist on all procedures and standards for identifying risk events?	3.9393	2
Does the process involve proper tools for teams to identify risks (checklists, automated forms, etc.)?	3.8323	3
Does the organization have a documented repeatable procedure for identifying project risks which is fully implemented?	2.1020	4
Are all procedures in place, documented and being used?	2.0353	5

Rating Scale: (Agreement)

1 = Strongly disagree; 2 = Disagree; 3 = Less agree; 4 = Agree; 5 = Strongly agree

The main objective of this sector is to assess the level of knowledge and awareness, including the perception of construction industry players, of identifying the level of project risk in general. Questions were ranked based on the level of significance (the average indexes) to identify the specifications of project risk.

6.3 Maximum Types of Risks Emanating from One Source

Table 5. Result of the questionnaire survey

Sources of Risk	Mean Rank	Rank
Financial	7.56	1
Quality	7.01	2
Geographical	6.01	3
Environmental	5.39	4
Legal	4.28	5
Social	3.23	6

Rating Scale: (Agreement)

1 = Strongly disagree; 2 = Disagree; 3 = Less agree; 4 = Agree; 5 = Strongly agree

During a construction project, risks can result from many situations. Based on the data analyzed earlier, a total of six sources of risk in construction projects were equated, as shown in table. Financial, construction and demand of quality and product risks are the highest risks in construction projects. There are some sources of risk related with engineering projects that have been identified. These sources of risks, the risk drivers, could be used as a checklist. However, the key sources of project risks are essentially the same.

7. CONCLUSIONS

The research results were acquired through questionnaire surveys conducted in India. The ways to identify project risk that have been particularized for construction projects have been presented from diverse points of view (from government, consultants and contractors) and construction companies and firms that may be helping the procedure of dealing with the project in the planning and construction phases. From the results it is safe to say that most of the construction projects have no systematic procedures in place to deal with the risks. Risk management is done in a very informal way.

The brain-storming gatherings were found to be the most preferred method of risk identification in the Indian construction industry. The risks related with Indian construction projects included financial risks (project funding problem), construction risks and demand/ product risks. These risks commonly prevent the accomplishment of construction project objectives in India. In contrast with other countries, Indian construction projects generally have been practiced with an informal manner for risk management. In most circumstances, government employees, consultants and contractors wait until issues arise during construction phases, and when they do the discussions are informal and intermittent.

Hence there is a thriving need to have a well-documented process which should be a one stop solution to all the risks that are likely to be faced. It might be hard to get all the data, information & knowledge together in order to identify the risks beforehand. But that is where the vision of research stands in value. There should be a more wholesome approach in the direction of risk management instead of the present irregular approach of meeting the risks as and when they come.

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REFERENCES

- [1] Al-Bahar, J.F. and Crandall, K.C. (1990). Systematic risk management approach for construction project. *Journal of Construction Engineering and Management*, 116(3): 533–546.
- [2] Artto, K.A. (1999). Development of World-Class Practices in Project Companies. In *The Future of Project Management*, Project Management Institute Research Series. Newtown Square, PA: Project Management Institute (PMI), 127–137.
- [3] Kendrick, T. (2009). *Identifying and Managing Project Risk: Essential Tools for Failure- Proofing Your Project*. 2nd Edition. New York: AMACOM Div. American Management Association.
- [4] Project Management Institute (2004). *A Guide to the Project Management Body of Knowledge*. Newtown Square, Pennsylvania: PMI.
- [5] Thompson, P. and Perry, J.G. (1992). *Engineering Construction Risks: A Guide to Project Risk Analysis and Assessment Implications for Project Clients and Project Managers*. London: Thomas Telford.

[6] Wysocki, R.K. (2004).Project Management Process Improvement. Norwood: Artech House.

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