

Risk Management in Residential Project by Primavera Software

Rohit Bhamare¹, Harshita Ambre²

¹Student M.Tech Construction Management, Department of Civil Engineering, Sandip University, Nashik

²Assistant Professor, Department of Civil Engineering, Sandip University, Nashik

Abstract - Risk management constitutes identification, assessment and sets a preference for risk mitigation. This may embody a synchronous and cost-efficient method of using the materials and resources so as to reduce the hazards that will rise with monitoring and controlling the unfortunate events that will occur in the project. The risk will happen because of uncertainty within the money market, accidents, failures within the project, natural factors, legal problems, the danger related to credit etc. Different methods can be applied to manage risk which may range from transferring the risk to the subsequent party, avoiding the risk factor, minimizing the consequences of risk and accepting the effect of risk in few cases. The project requires a special mission which is used by the client to get a viable edge in the market to operate. The previous projects don't match the following project because of its singularity that ultimately will increase the probabilities of hazards. The characteristics of each project keep on changing which make it difficult to be imitated. This requires unique skills to manage and accomplish the process

Key Words: Risk management, risk mitigation, risk, monitoring, and the probability of hazards.

1. INTRODUCTION

Risk Management is a concept which doesn't come only in the construction industry but has become very popular in all kind of business. Risk Management is becoming more and more important in the field of civil engineering. One of the main reason is that more and more projects fail, generating high unplanned costs. Risks can be so expensive that they even can lead to the downfall of a company. To increase the probability of success it is necessary for an organization to understand the potential risks that are involved in all these resources. Risk management is a fundamental component of project management. Risk management is one of the key element in effective project implementation and success. The risk management process is seen in different ways right from planning, identification, classification, analysis, response, monitoring and controlling. The main objective of risk analysis is to evaluate the impact of risk from particular consideration or task or activity and decide what action need to be taken. To avoid problems during a project most projects today use some sort of risk identification. This work often tends to end up with a delivery of a risk-list at the beginning of a project that few development teams put much attention into. Therefore the project will run into needless surprises in the schedule, product cost or features, project budget, team morale, or market acceptance. Often the nature

of these surprises shown late in the development when it is harder, sometimes impossible, to do anything about them. Often these surprises seem to occur in the project after project and the organization will not learn from past experiences. Experience can be an invaluable resource, but the organization has to learn from them and from others of how and what not to do. Constant problems with lack of resources a budget that cannot the hold is a situation that does not need to exist, all the tools and resolutions are available, yet only a few companies use them in their development processes.

1.1 Three essential aspects of risk:

- A) Uncertainty
- B) Loss
- C) Time

Uncertainty: A project manager has to identify as many uncertainties as possible. A risk may or may not happen. This inherent uncertainty cannot be eliminated, but it can be made a little clearer by clarifying the probability of occurrence of the risk. From this, it is cleared that, uncertainty cannot be totally eliminated but it can be reduced to some level. This means that if there is the best planning but no guarantee about perfection. Surprises may come anytime in any situation. Loss: In risk, it is already considered that loss will definitely come. If there is no loss then the project is not concerned with risk. It is impossible that risk without loss. If the risk is identified at the early stage then definitely loss will be less. For reducing loss risk must be identified very fastly and must resolve as early as possible.

Time: Time is a very important factor in risk. If the risk is very less time it is very beneficiary for the project. It is important to know when this time has arrived so the risk can be removed from the agenda.

If there is more time wasting for mitigation of risk then the loss will be more.

2. LITERATURE REVIEW

Andre Soderlind, 2007 [1] investigated that on how the Risk Management/Analysis work is done in a software development project at various companies. The conclusions drawn are for a Project Manager working in the fast-moving world of software development. Mr Satish K. Kamane and Mr

Sandip A. Mahadik 2009 [2] have given identification of risk by different methods, types of risks associated with construction project and different risk mitigation techniques. In the construction industry, the risk is often referred to as the presence of potential or actual threats or opportunities that influence the objectives of a project during construction, commissioning, or at time of use. Risk is also defined as the exposure to the chance of occurrences of events adversely or favorably affecting project objectives as a consequence of uncertainty. It may be stated that risk Management is the core of project management. Ahmad Rizal Razali and IzahMohd Tahir, 2011 [3] the first key point is the main role of ERM itself - it integrates and coordinates all types of risks across the entire organization. It means that risks cannot be managed in a silo approach. All risks occurred in the entity must be combined and managed in an enterprise approach. The second key point is by using ERM, users are able to identify any potential incidents that may affect the organization and know their risk-appetite. If the risk-appetite is specifically known, any decision made by the organization to curb risks may be parallel with the firm's objective. Dr R.K.Kansal and Manoj Sharma, 2012[4] investigated to assess the use and method of risk identification techniques in the construction industry. They are classified in specialized industrial construction, infrastructure and heavy construction. We conducted survey research by applying a questionnaire in the construction industry. The risk identification techniques more frequently applied in construction are a checklist, flowchart, Brainstorming, Delphi method etc. Based on a literature review on the risk assessment methods. The risk assessments approaches are applied in various areas and the problems solve. It was found that the currently used methods for risk assessment are Brainstorming, checklist, Flowchart Delphi method, Risk significant index method. Chiara Verbano and Karen Venturini, 2013[5] determined that analyzed available literature on the subject of risk management for small- and medium-sized enterprises from 1999 to 2009. The analysis derives interesting characteristics from the scientific studies, highlighting gaps and guidelines for future research. O. O. Odhiambo and C. F. Oduoza, 2013[6] collected data by three methods. These are the questionnaire, interviews and case study. In this study, the Delphi method for construction building project risk and the Bayesian belief network is adapted to model risk assessment/management in building construction environments. By analysing data a Framework for Risk Assessment of Building Projects in Construction Firms are prepared. Dr Haitham H. Al-Shibly, et al. 2013[7] collected data by sending 230 questionnaires and got 200 questioners back with a percentage of 87.4%. The study indicates that there is an impact of Risk response on project success, meeting the scope of work, scheduled time, and achieving the quality standards. K. Jayasudha and E.R. Gokul Surjith, 2014[8] study rely largely on the survey questionnaire which will be collected from the various multi-project construction contractors and project manager of different

sizes by mail or by personnel meeting. A thorough literature review was initially conducted to identify the risk factors that affect the performance of the construction industry as a whole. Construction of bridge projects is initiated in complex and dynamic problems resulting in circumstances of high uncertainty and risk, which are compounded by demanding time and cost constraints.

3. STATEMENT OF PROBLEM

Residential projects often overrun their planned finish date and total cost. Very large and complex projects may even be riskier and are sometimes called as fragile because issues in completing a key part in one area often affect other areas, which may ultimately cause sometimes huge cost and schedule overruns for the entire project. Most projects are so interconnected that it will require a lot of human resources which increases the chances of human error. For a holistic view of the effect of risk on project success, there is a need to develop risk analysis model of the residential project on automated computer software like Primavera to acquire data on project uncertainties and risks and calculate the probable effects of risks and uncertainties on a residential project in rapidly developing cities like Pune.

4. METHODOLOGY

The focus of this research is identifying the risks and analyzing there effects on the residential project in Pune. In this project, major causes are identified and study is made on the basis of actual case study on high rise building. A case study is formed in the form of a questionnaire survey and by giving factors by respondents. In this report, organization is interviewed and response is analyzed to form generalized report giving a specific idea about the causes affecting most to the company.

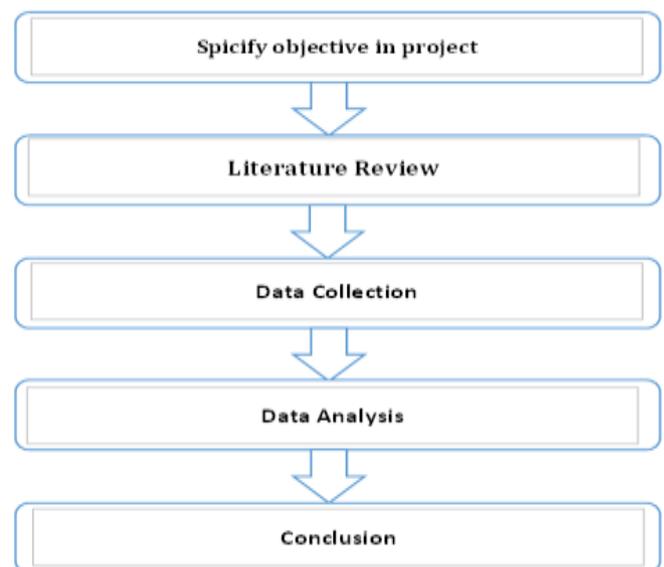


Chart -1: Flowchart of methodology

Step 1: Rank the probability, schedule and cost as per very high to very low.

Step 2: Analysis of response and calculate the probability score.

Step 3: Risk categorization

Step 4: Risk results wise factor count.

In this analysis probability is taken as per filled in survey report and impact is taken from cost. From probability and impact calculation probability score is identified. By using probability score average of each risk category is taken. After taking average risk categories are ranked as per high, medium and low.

4.1 data collection

For data collection, a questionnaire survey is done. In this questioner survey, a respondent has to give the probability of occurrence of a risk and its impact on the basis of time and cost. Total 10 respondent are for this survey and 28 general risks are considered. The ranking is done on the basis of 5 options viz. (Very high, High, Medium, Low, Very low).

Very High: Most chances of occurrence.

High: Much chances to occur.

Medium: Frequently occurs.

Low: Sometimes occurs

Very Low: Very rarely (Negligible) occurrence.

Average Taken From the Survey is then used for data analysis purpose.

4.2 data analysis

Response analysis table is created and its results are tabulated. At the time of calculation, only the probability parameter is taken into consideration. In this analysis probability is taken as per filled in survey report and impact is taken from cost. For example:

Probability = 5

Impact = 5

Probability score = 5*5 =25

As per this data, the sheet is filled for all risks and analysis is done.

Probability	Impact	PriorityScore= Probability x Impact
5>70%	5 = Critical	
4>50%	4 = Severe	
3>30%	3 = Major	
2>10%	2 = Moderate	
1>0%	1 = Minor	

Table no. 1: Priority Score Criteria

Name	Probability	Impact	Probability Score
1) Time			
Logistical risk	4	3	12
Centring work not completed in time	2	2	4
Financial problems of the firm	5	5	25
Windows are not ready to fix	3	4	12
2) Quality			
Not proper supervision	1	2	2
An improper mixture of material	3	2	6
3) Project Management			
Improper selection of site	3	4	12
Planning and designing	2	2	4
Government rules and regulations	2	2	4
Rera effect on booking	3	3	9
4) Contract			
Change in contractors demand	2	2	4
Not using a selected material	2	1	2
5) People			
Health and safety of labours	4	4	16
Strike of labours	5	5	25
Thieves on site	2	2	4
Lack of skilled labour	1	3	3
Line out of blocks is improper	3	3	9
Unskilled labours doing electrical work	3	3	9
Scaffolding not properly	2	2	4

tightened			
Clients demands are different	4	5	20
6) Market			
Change in rates of material	4	3	12
The constraint of availability of concrete	3	3	9
7) Environment			
Water percolation while excavation	2	1	2
Heavy rain while construction	4	2	8
8) Cost			
Different soil conditions	4	3	12
Availability of resources	5	4	20
Damage of	3	1	3
Damage of electrical wires	2	2	4

Table No. 2: Probability Score of risks.

From the probability score percentage of each category is calculated. In result. (0-10%) in low, (11-15%) in medium, (16-25%) in high. So, the average of each category is as below:

Risk Category	Average Score	Percentage	Result
Time	13	21%	H
Quality	4	6%	L
Project Management	7	11%	M
Contract	3	5%	L
People	11	17%	H
Market	10	16%	H
Environment	5	8%	L
Cost	10	16%	H
	63	100%	

Table No. 3: Risk Categories and Results

Sr. No.	Risk Result	Factor Count
1	High	4
2	Medium	1
3	Low	3

Table No. 4: Factor count

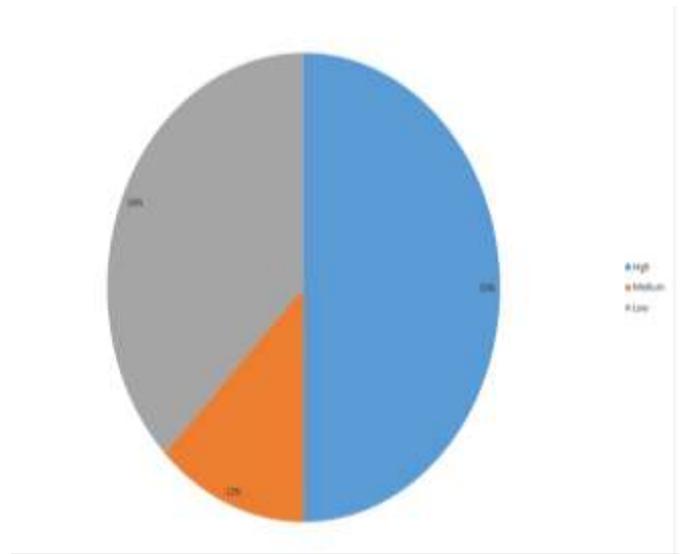


Chart -2: Risk Result, wise Factor Count.

As it is seen that 50% of risk categories fall under 'High risk', 13% under 'medium risk', 38% Under 'low risk.'

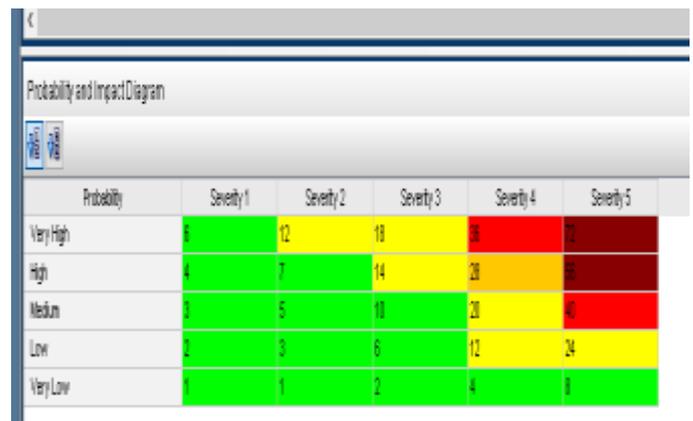


Chart -3: Probability and Impact Diagram.

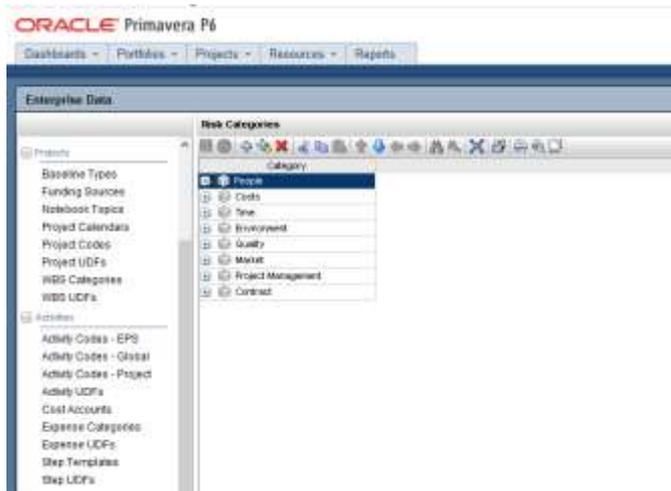


Chart -4: Risk Categories.

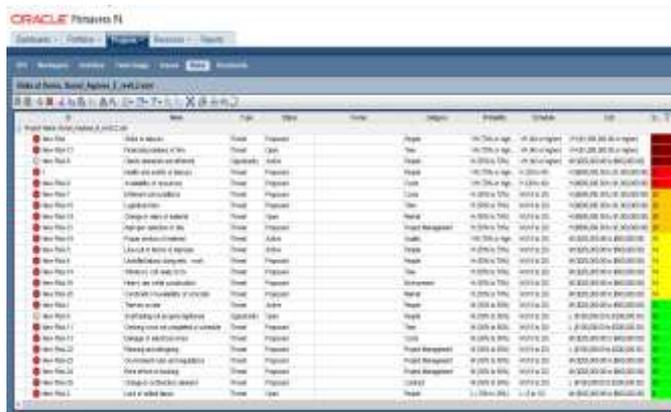


Chart -5: Risks Details in Project.

5. CONCLUSIONS

1. This research is unique in a way that a project case study is used to develop a better understanding using the realistic data compared with the formulated model of risks.

2. A stepwise case study is elaborated in the light of the guidelines. From the results of the case study of building construction at Pune, it showed that the forecasted results are approximately accurate as per their experience.

3. In the case study, high-risk categories are time, people, market and a cost which are highlighted in red colour. Medium risk is identified project management and low risks are identified as quality, contract and environment.

4. Out of eight main categories four categories are under high risk, one is under medium risk and three are under low risk.

5. Future scope of the project is wide as the same model can be applied in similar constructions to avoid risks. The model can be easily modified and applied in any construction risk involving attributes to analyse the most critical attributes causing risks to the construction of the building.

REFERENCES

- [1] André Söderlind For Master Of Science Thesis In The Master Degree Programme. Department Of Civil And Environmental Engineering Division Of Building Economics And Management CHALMERS UNIVERSITY OF TECHNOLOGY NORTHUMBRIA UNIVERSITY, NEWCASTLE U.K. Göteborg, Sweden, 2007.
- [2] Mr. Satish K. Kamane, Mr. Sandip A. Mahadik, Risk Management in Construction Industry, IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) ISSN: 2278-1684, December 2009, PP: 59-65.
- [3] Ahmad Rizal Razali and Izah Mohd Tahir. Review of the Literature on Enterprise Risk Management. Business Management Dynamics Vol.1, No.5, Nov 2011, pp.08-16.
- [4] DR. R. K. Kansal, Manoj Sharma, Risk Assessment Methods and Application in the Construction Projects, International Journal of Modern Engineering Research (IJMER), www.ijmer.com Vol.2, Issue.3, May-June 2012 pp-1081-1085 ISSN: 2249-6645.
- [5] Chiara Verbano, Karen Venturini , Managing Risks in SMEs: A Literature Review and Research Agenda Received Jun. 28, 2013 / Accepted Sep. 18, 2013.
- [6] O. O. Odimabo, C. F. Oduoza, Risk Assessment Framework for Building Construction Projects in Developing Countries, International Journal of Construction Engineering and Management 2013, 2(5): 143-154 DOI: 10.5923/j.ijcem.20130205.02.
- [7] Dr. Haitham H. Al-Shibly, Dr. Basem M. Louzi Mohammad A. Hiassat, The impact of risk management on construction projects success from the employees perspective, Interdisciplinary Journal Of Contemporary Research In Business, AUGUST 2013 VOL 5, NO 4.
- [8] K. Jayasudha Dr. B.Vidivelli and E.R. Gokul Surjith, Risk Assessment and Management in Construction Projects, International Journal of Scientific & Engineering Research, Volume 5, Issue 8, August-2014 ISSN 2229-5518.