

An Identification Of Various Risk Involved In Pune Metro Rail & Surrounding Area Of Project...

Focus On Katraj To Shivaji Nagar Lane, Pune. Maharashtra

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ABSTRACT

Pune metro project is one type of major construction project. Risk in construction has been the object of attention because of time and cost over-runs associated with construction projects. Organizations from many industries have recognized the increasing importance of risk management and many companies have established risk management departments to control the risks they are, or might be, exposed to. This paper is discussing on an assessment of various risk involved in Pune Metro Rail Project and surrounding area, in that case to first identifying the risk factors based on that condition of to collect the data from different literature reviews and also conduct the questionnaire survey related to risk. This paper is to shed the risk may be available between the metro projects from Katraj to Agricultural College via Swargate and surrounding area through various parameters. To analysis the date and questionnaire survey by using RII system. Relative Importance Index method helps to determine the relative importance of the each factors affecting to risk

Keywords— *Construction Project, Project Risk, Risk Assessment, Questioner Survey, RII*

1. INTRODUCTION

A big construction projects involve complex, time consuming design and construction processes characterized by unforeseen circumstances. For an infrastructure project, risk evaluation can be carried out effectively by investigating and identifying the sources of risks associated with each activity of the project. These risks can be assessed or measured in terms of likelihood and impact.

A project like Metro rail, Monorail and Sky bus is today's requirement as the population is increasing faster than any other country. Metro rail project and other presents a great prospect as a fastest and cleanliest mode of urban transport. Some of these projects may be forming headlines due to the issues raised about their viability or private involvement but for citizen of that city it has proved boon thus government is frequently investing in such projects.

Pune is one of the fastest growing city in India both population wise and business wise and the cultural capital of Maharashtra. Pune metro rail project is one of the dream projects from which local citizen had lots of expectations. Experts claimed it as one of the milestone in urban transport history. But soon after the DPR is prepared and local citizen got to know about the alignment, technology and other system that are considered for this project, they felt that there are many better options available that is not considered and even after finalizing the alignment and related documents local citizens and environmentalists views are not gathered and considered to check at least the end

user perception. For this paper we select the metro project from Katraj to Shivaji nagar. There are two different methods of the construction of metro rail one is elevated metro i.e. above ground level at some height and second is underground metro. Now we will assess the risk associated with construction of underground metro rail as well as elevated metro rail. We have prepared a questionnaire for survey which include personal interview from the actual ground where the metro rail run. The questioner includes various factors which needed to introduce for identification on point of views of local residence and technical persons.

2. AIM AND OBJECTIVE

This paper focus the risk involved in this metro project and surrounding area through questioner survey and opinion of local person so that we can try to find the socio-economical-environmental risk and other technical risk with help of Relative Importance Index method to determine the relative importance of the each factors affecting to risk

3. LITERATURE RIVEW

As per Altaher Mohamed Eida et Al, to identify the different risk factors that affect the performance of construction projects with the help of appropriate tools and technique for the development of desirable risk management framework to reduce the affect of risk. This study investigates, categorizes and evaluates the risk and develops a risk management policies and guidelines to the company contractor which can be adopted at the construction projects site for better and risk free construction work. The questionnaire prepared for the survey was formulated by seeing the relevant literatures in the area of construction management. The responses were analyzed by bar chart, standard variance & mean using the software of SPSS.

As per Walker and Dorofee, risk management could be put into practice. Their methods were based on software program along with risk reduction road map design for risk management. These could guide and help identify various risk management methods which could be easily put into practice Complex projects like the construction of an underground corridor for metro rail operations involve risks in all the phases of the project starting from the feasibility phase to the Operational phase. These risks have a direct impact on the project schedule, cost and performance.

As per Mulholland and Christian, a model in a systematic way to find out uncertainty in construction schedules. With the help of past project experiences the researcher describes a risk assessment process involving typical inputs and expected outputs. The model includes knowledge and experience acquired from many experts, project-specific information, decision analysis techniques, and a mathematical model to estimate the amount of risk in a construction schedule at the initiation of a project.

The author Oleg Kaplinski describes the method of defining the utility function as the decision maker is faced with a choice between certitude of a given result and a lottery was to extreme results. The two contrasting cases of function of utility, that is characteristic of a decision maker with an aversion to risk, and decision maker with a predilection to risk, are then analyzed in detail. The suggested procedure of analyzing and identifying attitudes towards risk is based on the new criterion of maximization, namely the criterion of maximization of the expected result which has been replaced by the criterion of maximization of expected utility. It significantly changes the approach to analyzing risk, especially in construction industry.

The Shen L Y , identified the most serious project delay risks and the effective actions for managing these risks. Practically risk management actions and their effectively have been find out through a questionnaire survey. It revealed that methods where the experience of surveyor and subjective judgment are used are the most effective and important risk management action, and that methods using quantitative analytical techniques have been rarely used due to limited understanding and experience. The output and analysis of this survey suggest a need to make a awareness of various analytical; techniques for risk management for construction industry.

4. RESEARCH METHODOLOGY& DATA COLLECTION

Following flowchart shows the methodology for this Project and data collection process,

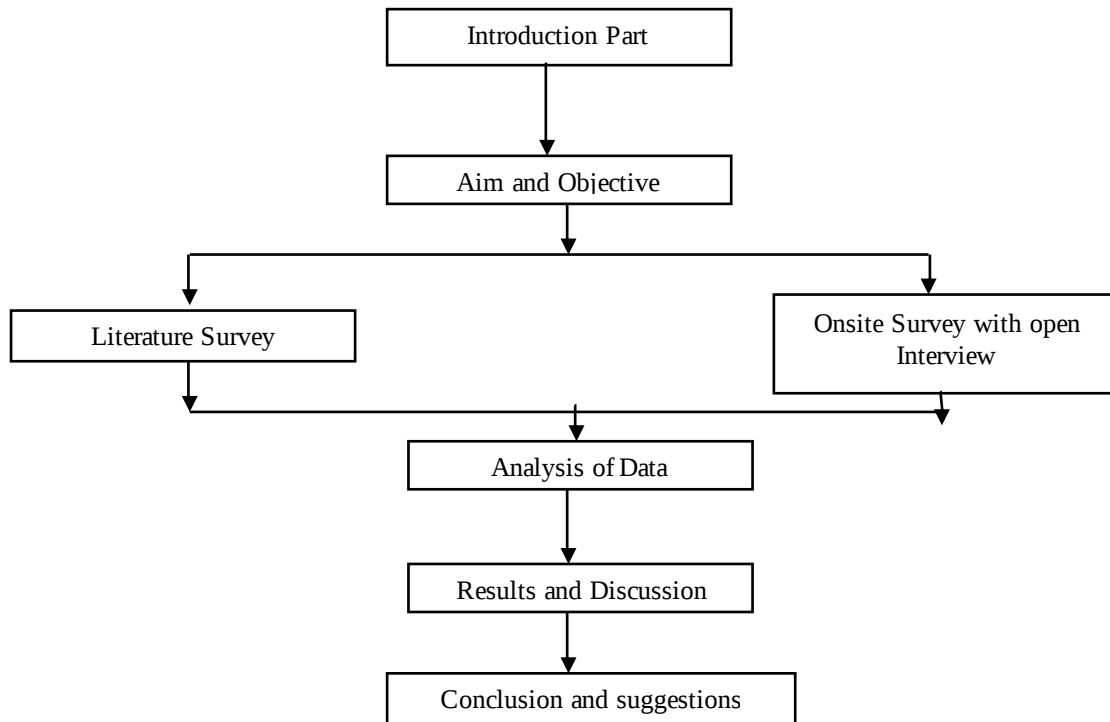


Chart No.-1 Chart Showing the Methodology for Project/Paper

5. PROPOSED ROUTES AND PHASES OF PUNE METRO PROJECT

The proposed routes of Pune Metro rail project are given below,

Table No. 1 Proposed Metro Corridors

Sr.No.	Details(Alignment)	Length In Km		
		Elevated	Under Ground	Total
1	Agricultural college to Nigidi via Pune Mumbai road	16	0	16
2	Agricultural college to Warje via JM and Karve road	8.7	0	8.7
3	Agricultural college to Hadapsar via Mhatre bridge	16	0	16
4	Agricultural college to Vagholi via Bund garden road	16	0	16
5	Agricultural college to Hinjewadi via Aundh	17.5	0	17.5
6	Agricultural college to Swargate and Katraj via Shivaji road	7	5	12

We highlight on Agricultural College to Swargate and Katraj via Shivaji road for this Project work which having high density of traffic throughout the day. This route having old memory of pune like Shanivar wada, Tulsi baug, Mandai etc, so the risk on this route is very high than other route. This route having both elevated and underground metro of 12 Km length.

6. DATA COLLECTION AND ANALYSIS

The survey questionnaire was designed to get the ranking of above risks by suitable technique. The survey questionnaire is made up of abstract of 4 basic and theoretical risk factors as studied in various research papers and by observation which is combination of Technical and Socio-political- Environmental-Surrounding risk.

Respondents have to give ranking under the category for Less Important (1), Relevant (2), Essential (3), Important (4), Most Important (5). Detailed questionnaire was distributed to many on site and off site technical persons firms who are working for metro project and local residences surrounding the metro project. Total 60 questionnaires were distributed out of which 52 replies received. Following is the questioner which we prepared,

Nature of Participant-								
Name of Company--								
Name & Address of Project --								
Name of Participant with Designation & Contact No.—								
Factors	Category	RESPONSE					RII	Rank
		1	2	3	4	5		
Technical Risks	Incomplete Design	8	10	7	12	15	0.662	14
	Inadequate specification	8	10	8	12	16	0.692	10
	Inadequate site investigation	10	8	12	12	10	0.615	22
	Change in scope Construction procedures due to site condition	6	10	17	10	11	0.662	14
	Insufficient Resource availability on site	9	10	10	10	15	0.669	13
Construction Risks	Labour disputes on site	9	8	10	15	10	0.635	21
	Site condition changes	9	9	15	8	11	0.612	23
	Equipment failures on site	8	9	9	15	11	0.646	18
	Design changes due to site condition or as per requirement	10	8	8	13	13	0.642	19
	Changes in laws and regulations for environmental protection or any other condition	4	8	9	13	18	0.727	4

Socio-Political-Environmental-Surrounding Risks	Language/Cultural barrier	5	10	11	16	10	0.662	14
	Requirement for permits and their approval	8	8	11	13	12	0.650	17
	Political Pressure	6	6	7	15	18	0.727	4
	Acquisition of Land	4	4	8	14	19	0.719	7
	Water Logging Problem in Rainy Season	8	8	7	15	14	0.673	12
	Vibration occurred below the structure due to work	7	9	8	11	17	0.685	11
	Insurance for all project and surrounding area	6	5	8	16	17	0.727	4
	Relocation risk of Project Surrounding People	3	4	5	17	23	0.804	2
	Natural Disasters Fighting system	6	7	10	14	15	0.696	9
	Traffic Diversion Problem during and after completion of project	3	4	6	16	23	0.800	3
	Historical Building Preservation problem during and after project.	3	4	5	15	25	0.812	1
Financial Risks	Increased material cost due to delay	8	7	4	13	20	0.715	8
	Payment delays by government	12	14	9	8	9	0.554	24
	Improper estimation of project	11	13	14	8	6	0.542	25
	Taxes increase	7	8	14	13	10	0.642	19
Total =		178	201	232	324	368	0.679	

The feedback from the respondents had been analysed using Microsoft Excel application. Based on the content of the questionnaires, the analysis was divided into two sections: demographic and relative importance index analysis. Relative index analysis was selected in this study to rank the criteria according to their relative importance. The following formula is used to determine the relative index,

$$RII = \Sigma W / (A * N)$$

Where, W is the weighting given to each factor by the respondents (ranging from 1 to 5), A is the highest weight (i.e. 5 in this case), and N is the total number of respondents. Higher the value of RII, more important risk factors. We found out the average of RII for above feedback, then above the average value of RII is the risk factors and accordingly we rank them.

According to Raja ra Rafidah five important levels are transformed from RI values: high (H) ($0.8 \leq RI \leq 1$), high medium (H-M) ($0.6 \leq RI \leq 0.8$), medium (M) ($0.4 \leq RI \leq 0.6$), medium-low (M-L) (0.2

$\leq RI \leq 0.4$) and low (L) ($0 \leq RI \leq 0.2$). In this feedback 3 are major risk factors, 20 are high medium factors, while 2 are medium factors of risk.

7. CONCLUSION

The success of a project management exercise depends very much on the efficient management of risk in big project. There are two different methods of the construction of metro rail one is elevated metro i.e. above ground level at some height and second is underground metro. The processes of risk management are Risk Identification, Risk Classification, Risk Analysis, and Risk Response. In Metro project this paper is only focus on Financial, technical, construction and socio-technological-environmental-surrounding risk for finding the factors with likart's scale only. For this project onsite survey and open interview was conducted to finalize the risk. As per feedback 3 are major risk factors, 20 are high medium factors, while 2 are medium factors of risk.

8. REFERENCES

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