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Risk Assessment in Residential Construction Projects by SPSS

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Abstract

Risk management is about thinking ahead and preventing things from going wrong. Managing risks in construction projects have been recognized as a very important process in order to achieve project objectives in terms of time, cost, quality, safety and environmental sustainability. This research focuses on residential projects across four cities of Gujarat i.e. Ahmedabad, Anand, Vadodara, Nadiad. The data were collected from the experienced personnel in the construction industry with ample amount of experience. Software like SPSS Statistics 17.0 (Statistical Package for Social Science) and MS-Excel were adopted to evaluate the collected responses from different personnel from the construction industry. The aim of this study to find the critical factors affecting construction projects and correlation between them. This paper presents the factors with the highest probability and/or impact on any project and correlation between them through statistics. This result may prove to be a handful of the people of the construction industry by providing a benchmark for future studies.

Keywords: Risk, Risk Management, SPSS, Construction Projects.

Introduction

Background

Risk can be defined as the event that negatively affects the project objectives. Risk Management is the process of identifying the potential risk associated with risk and responding to those risks. Risk in any project is a choice rather than fate. According to the characteristic of the construction industry, which has high uncertainty, so it will occur many risks during the construction phase and or operational building. Risk in construction has been the object of attention because of time and cost over-runs associated with construction projects.\

In recent years, intensive research and development have focused on project risk management. Project risk management is widely recognized as one of the most critical procedures and capability areas in the field of project management. Risk management is probably the most difficult aspect of project management.

Construction projects can be unpredictable. Managing risks in construction projects have been recognized as a very important process in order to achieve project objectives in terms of time, cost, quality, safety and environmental sustainability.

Project risk management is an iterative process: the process is beneficial when is implemented in a systematic manner throughout the lifecycle of a construction project, from the planning stage to completion.

Significance of the Study

The main objective of this study is to identify and control the possible future risk proactively rather being reactive. To spread awareness regarding risk management in the construction industry. It is needed to study risk management because its execution is very less in the construction industry compared to other industries due to lack of knowledge. The track record of the construction industry is very poor in terms of coping up with risks in projects. This study is limited to four cities i.e. Ahmedabad, Anand, Vadodara, Nadiad.

Research Methodology

The study begins with understanding the process of risk management. Afterwards the factors were identified for risk analysis. Then the questionnaires were prepared on impact of risk and

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probability of occurrence of risk. Then the data were collected from various personnel from the construction industry with ample amount of experience. After that, the data were analyzed with

Statistical Package for Social Science (SPSS) software.

Risks involved in the Construction Industry

The following Table:1 shows the different types of Risks involved in the Construction Industry.

Table:1 Risks involved in the Construction Industry

Technical Risk	Logistical Risk
Inadequate Site Investigation	Insufficiency of Transportation Facility
Incomplete Design	Insufficiency of Equipment Availability
Inappropriate Specification	Non-availability of Operators
Uncertainty of Material Availability	Non-availability of Maintenance Facility
Management Related Risk	Environmental Risk
Unstable Management	Natural Disaster
Uncertain Productivity	Weather Implication
Problematic Industrial Relation	
Financial Risk	Socio-Political Risk
Fluctuation in Foreign Exchange	Customs & Imports Restriction
Payment Delays	Constraints on Availability of Expatriate Staff
Inflation	Constraints on Employment of Expatriate Staff
Local Taxes	Insistence on Use of Local Firms & Agents
Common Source of Risk	Other
Design Errors	Compressed Time Schedule
Design Omissions	Large Team Size
Change in Project Scope	History
Change in Project Requirement	Complexity
Inadequacy in Roles of Staff	
Inadequacy in Responsibilities of Staff	
Insufficiency of Skilled Staff	
Inadequacy of Contractor Experience	
New Technology	
Unfamiliarity with Local Conditions	
Unavoidable Accident	

Data Collection & Analysis

The data were collected from total 44 numbers of respondents from different cities like Ahmedabad, Vadodara, Anand, Nadiad. The

respondents were with ample amount of experience working in the construction industry. The collected data entered in a spreadsheet for further analysis. Analysis was done with Statistical Package for Social Science (SPSS) software.

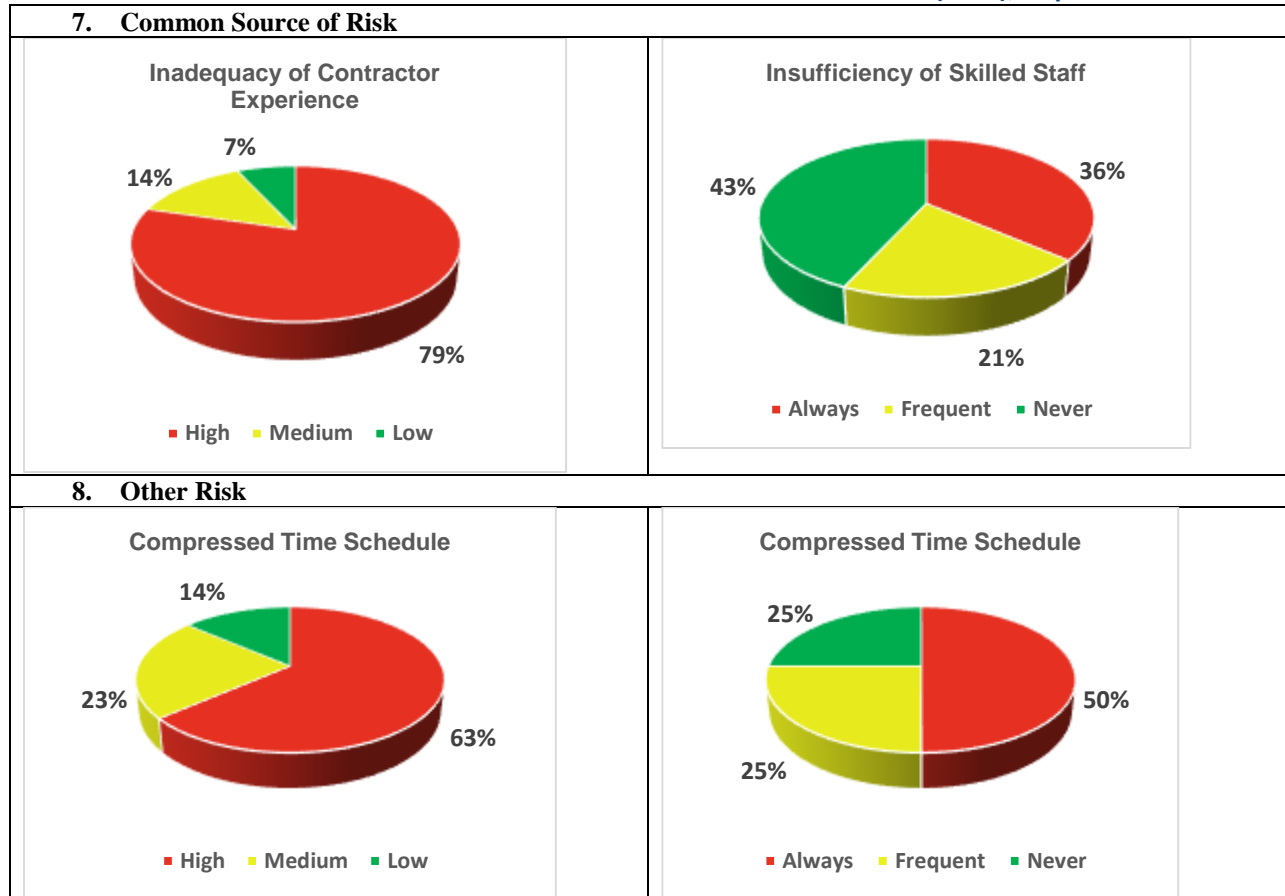
Frequency Analysis

Frequency Analysis is used to find out the detailed information about each variable entered into a spreadsheet. In this analysis the graphs shown in table-2 were having highest impact and/or probability in different type of risk than other sub factors.

Table: 2 Frequency Analysis of different Risk Factors

Impact	Probability							
<p>1. Technical Risk</p> <div data-bbox="181 415 802 823"> <p>Inadequate Site Investigation</p> <table border="1"> <caption>Impact Data for Inadequate Site Investigation</caption> <thead> <tr> <th>Impact Level</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>57%</td> </tr> <tr> <td>Medium</td> <td>27%</td> </tr> <tr> <td>Low</td> <td>16%</td> </tr> </tbody> </table> </div>	Impact Level	Percentage	High	57%	Medium	27%	Low	16%
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<p>4. Environmental Risk</p>																	
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Correlation Analysis

Correlation Analysis is used to find out the correlation between two or more variables.

Table: 3 Correlation Analysis of Technical Risk (Impact)

Impact	Technical Risk	Inadequate Site Investigation	Incomplete Design
Inadequate Site Investigation	Pearson Correlation	1	0.406**
	Sig.		0.006
	N	44	44
Incomplete Design	Pearson Correlation	0.406**	1
	Sig.	0.006	
	N	44	44

Table: 4 Correlation Analysis of Technical Risk (Probability)

Probability	Technical Risk	Inadequate Site Investigation	Incomplete Design
Inadequate Site Investigation	Pearson Correlation	1	0.520**
	Sig.		0.000
	N	44	44
Incomplete	Pearson Correlation	0.520**	1

Design	Sig.	0.000	
	N	44	44

Table: 5 Correlation Analysis of Financial Risk (Impact)

Impact	Financial Risk	Inflation	Local Taxes
Inflation	Pearson Correlation	1	0.449**
	Sig.		0.002
	N	44	44
Local Taxes	Pearson Correlation	0.449**	1
	Sig.	0.002	
	N	44	44

Table: 6 Correlation Analysis of Financial Risk (Probability)

Probability	Financial Risk	Inflation	Local Taxes
Inflation	Pearson Correlation	1	0.544**
	Sig.		0.000
	N	44	44
Local Taxes	Pearson Correlation	0.544**	1
	Sig.	0.000	
	N	44	44

Conclusion

Frequency Analysis:

Technical Risk: In the case of Impact the maximum impact is of inadequate site investigation i.e. 57%. It means that 57% respondents says that inadequate site investigation is having maximum impact on construction project. In case of Probability the minimum probability of occurrence is of uncertainty of material availability i.e. 48%. It means that 48% respondents says that uncertainty of material availability is having a minimum probability of occurrence on a construction project. Subsequently, for other factors this type of graphs are shown in table:2 above.

Correlation Analysis:

In case of Technical Risk, inadequate site investigation and incomplete design, Pearson correlation coefficient, r , is 0.406 and it is statistically significant and it means as in case of an impact of technical risk, they are correlated to each other. For probability of technical risk, Pearson correlation coefficient, r , is 0.520 and it is statistically significant and it means as in this case they are correlated to each other. In case of Financial Risk, inflation and local taxes, Pearson correlation coefficient, r , is 0.449 and it is statistically significant and it means as in case of impact of financial risk, they are correlated to each

other. For probability of financial risk, Pearson correlation coefficient, r , is 0.544 and it is statistically significant and it means as in this case they are correlated to each other.

Acknowledgement

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