

Risk Management Model for Residential Real Estate Project

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Abstract— For years, many research studies have focused on real estate projects for the risk reduction and increase the output from the real estate industry with the help of following complete risk management. However, Real estate industry is having projects which are very intricate in nature, where uncertainties & risks raise from different sources. In this article I consider the presence of risk in real estate industry two scenario, one is Optimistic Scenario and other is Pessimistic Scenario of seasonal type that affects some of the activities that comprise the project. I discuss how the project risk can be affected by such uncertainty, depending on the start date of the project. An effective and efficient risk management approach requires a proper and systematic methodology and, more importantly, knowledge and experience. This paper addresses the problems of risk management in construction projects using a knowledge-based approach, and proposes a methodology based on a three-fold arrangement that includes the modeling of the risk management function, its evaluation, and the availability of a best practices model. A major preliminary conclusion of this research is the fact that risk management in construction projects is still very ineffective and that the main cause of this situation is the lack of knowledge. It is expected that the application of the proposed approach will allow clients and contractors to develop a project's risk management function based on best practices, and also to improve the performance of this function.

Key words: risk management, residential real estate, Monte Carlo simulation

I. INTRODUCTION

Real estate industry is having projects which are very intricate in nature, where uncertainties & risks raise from different sources. Risk management is concept which is used in all industries from, IT related business, automobile, pharmaceutical industry, to the construction sector. Many industries have become more proactive of using risk management concept in project. However, with regard to real estate industry, the same is not used commonly.

Risks & uncertainties inherent in the residential real estate industry are more than other industries. The Real estate sector is a multifaceted activity combining various discipline ranging from law, banking, finance, marketing, property management, architecture etc. The Real estate sector has become visible and is a dominant role in any city scan of the country today.

It can be broadly defined as an activity of production, financing, marketing and real estate property management. Thought real estate development has been taking place since several decades now mostly in a disorganized manner in the recent times it has come to more sharply in focus.

The major participants in the real estate sector are the land owners, land and building developers, construction contractors, financiers, marketing organization, designers

and property managers. Risk management of real estate is the identification, assessment, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives) followed by coordinated and economical and execution application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities.

II. WHAT IS RISK MANAGEMENT?

“Risk Management can be defined as the systematic process of identifying, analyzing and responding to project risk. It has six steps: risk identification, qualitative risk analysis, quantitative risk analysis, risk response, planning, risk monitoring and control (Dec, 2012; PMI (Project Management Institute), 2008).”

Risk management is a process of thinking systematically about all possible risks, problems or disasters before they happen and setting up procedures that will avoid the risk, or minimize its impact, or cope with its impact. Risk management is probably the most difficult aspect of project management. A project manager must be able to recognize and identify the root causes of risks and to trace these causes through the project to their consequences. Furthermore, risk management in the construction project management context is a comprehensive and systematic way of identifying, analyzing and responding to risks to achieve the project objectives.

The use of risk management from the early stages of a project, where major decisions such as choice of alignment and selection of construction methods can be influenced, is essential. The benefits of the risk management process include identifying and analyzing risks, and improvement of construction project management processes and effective use of resources.

III. RESIDENTIAL REAL ESTATE RESEARCH SIGNIFICANCE

The main objective is to study the different phases of real estate and find out the risks associated with each phases. The objective is to analyse the all risks in each phase and find out the most vulnerable risk for each phase. The objective in the direction of discover the probable measures and precautions to avoid or to tackle with the vulnerable risks of each phase for project safety. The finalize the objective with develop the conceptual model of risk management solution for real estate industry.

IV. METHODOLOGY

A. Analyze The Developed Methods And Procedures:

First off all I want to know and understand the method, procedure and sequential steps for the developed the real estate sector in vadodara city from different developers and real estate bodies.

B. Literature Review:

Literature pertaining to Risk management and assessment, analyses the different phases of real estate industry and to increases my efficiency I will also refer PMBOK® for effective solution and results.

C. Data Collection:

Data will be collected from mainly people/companies/firms who enjoy leading role for real estate industries e.g. project manager, general manager, civil engineer, site engineer, investor, owner from government, construction and consulting companies and firms in defined area study.

D. Risk Identification:

Risk Identification will be made by work breakdown structure, brain storming, checklist templates and knowledge of expert judgment and identify with the Relative important index technique.

E. Data Analysis:

Based on the collected data, analysis will be made to find out the rating scale of risk by various phases and find out the solutions that can be economical and lesser damages to the environment with risk assessment and risk ranking.

F. Risk Response Planning And Controlling:

Risk response planning will be done through high exposure risks mitigation planning risk response control made through monitoring tools.

G. Developing Conceptual Model For Risk Management:

Based on the analysis relevant conceptual model made.

V. RISK CATEGORY AND RISK IDENTIFIED THROUGH LITERATURE REVIEW AND PILOT SURVEY

Risk Category	Risk factor
Construction	Land acquisition
	Shortage of equipment
	Shortage of material
	Late deliveries of material
	Poor quality of workmanship
	Site safety
	Insolvency of subcontractors
	Inadequate planning
	Weather
	Insolvency of suppliers
Politics & Contract Provision	Change in law and regulation
	Delay in project approval and permit
	Inconsistencies in government policies
	Excessive contract variation
	Poor supervision
	Bureaucracy
	Compliance with Government
Finance	Delay in payment for claim
	Cash flow difficulties
	Lack of financial resources
Design	Improper design

Environmental	Change of scope
	Pollution
	Ecological damage
	Compliance with law and regulation for environment issue

Table 1: risk category and risk factors

VI. ERM AND BUSINESS CONTINUITY

There is an important relationship between the Enterprise Risk Management (ERM) and Business Continuity Management (BCM). Risk assessment that is required as a part of risk management process and the business impact analysis that is the basis of business continuity planning are closely related to each other. Usually in the risk management process, objectives of an organization's are evaluated and risks that could impact the objectives are identified. While on the other hand, the identification of the critical activities that must be maintained for the organization to continue to function is the output of business impact analysis. The ERM approach and the business impact analysis approach are very similar, because both approaches are based on the identification of the key dependencies and functions that must be in place for the continuity and success of the business.

VII. DATA ANALYSIS

A. Expected Monetary Value Method:

The data collected was assessed through expected monetary value method to quantitatively prioritize a risk. Expected monetary value method is used to prioritize the risks with the highest probability of occurrence or the risks with the greatest monetary impact. During data collection, Likelihood of occurrence and Impact for each factor was rated in the scale of 1 (Very Low) to 5 (Very High) and 1 (Not Significant) to 5 (Extremely Significant) respectively.

Risk category	Impact	Severity	Ranking
Strategic risk	3.67	14	1
	3.47	13	2
Financial risk	3.75	13	1
	3.58	13	2
Human resource management related risk	3.71	12	1
	3.71	12	1
Market risk	3.47	11	1
Operational risk	3.75	13	2
	3.73	14	1
Political risk	3.33	11	2
	3.51	11	1
Marketing risk	3.73	13	1
	3.40	11	2

Table 2: Expected Monetary Value, Ranking and Significance Level

B. Output of Monte Carlo Simulation:

The output of Monte Carlo simulation shows that when simulation is done at 95% of confidence, total risk cost changes as shown below:

- Total Risk Cost of a 100 crore project: □ 1170 Lacs
- Total Risk Cost at 99 % confidence: □ 1282 Lacs
- Total Risk Cost at 95 % confidence: □ 1247 Lacs
- Total Risk Cost at 90 % confidence: □ 1028.7 Lacs
- Contingency @ 95% confidence: □ 77 Lacs
- % Contingency: 6.59%

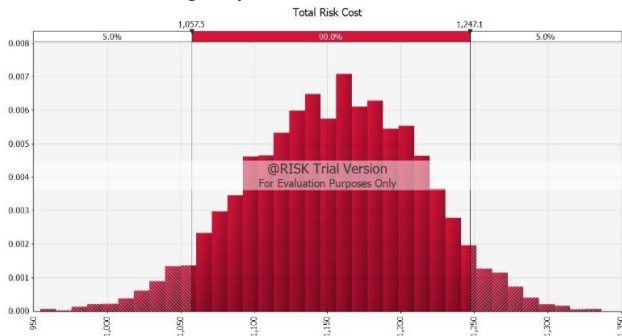


Fig. 1: Simulation Result Graph of Total Risk Cost

Similarly, for all the risks having very high severity simulation at 95% confidence was carried out and % contingency for each risk was calculated.

VIII. PROPOSED RISK MANAGEMENT MODEL FOR RESIDENTIAL REAL ESTATE

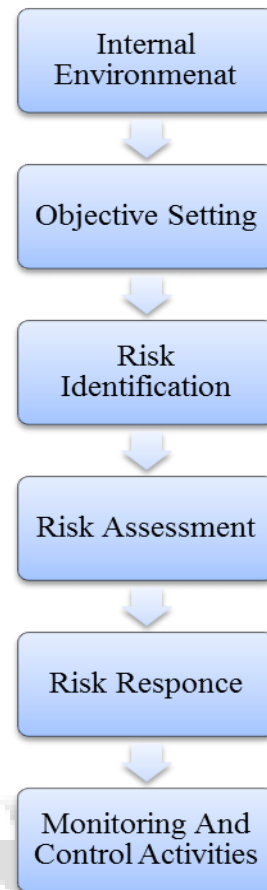


Fig. 2: model of risk management for residential real estate

IX. CONCLUSION

- The major risk categories that any organization residential real estate must consider during their conceptualization stage are given in “Table 1: risk category and risk factor.
- From the results of EMV of likelihood of occurrence & impact, risk severity of each risk was calculated. From the risk severity and risk assessment matrix the most severe risks in each category was found. The most severe risk in each categories are shown in “Table 4: Expected Monetary Value, Ranking and Significance Level.
- From the expert survey it was found that in a residential real estate project of 100 crore, approx. 11.7 % of cost is kept for total risk assessment and management for the most severe risks. From the data analysis it was found that at 95 % confidence cost for risk assessment and management may rise up to 12.47 % and at 99 % confidence it may rise up to 12.82 %. Simulation results are shown in “Figure No. 1: Simulation Result Graph of Total Risk Cost” Monte Carlo simulation model for each risk was produced which shows the contingency required for each risks.
- The proposed Risk management model for residential real estate startup is shown in “Figure

No. 2: model of risk management for residential real estate.

X. FUTURE SCOPE

This research mainly focuses on the residential business in real estate sector of Vadodara city. Further research can be carried out in other aspects of real estate sector viz. Commercial, Institutional, Industrial. Also research can be carried out to assess and manage the risks so as to sustain in the market after the completion of conceptualization stage.

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