

ANALYSIS OF FACTORS AFFECTING ON COST MANAGEMENT: SURVEY OF REAL ESTATE SECTOR OF VADODARA CITY USING RII METHOD

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Abstract: Time and Cost are an essential and most relevant factor in the construction industry. These factors are to be considered for the planning of every project. In any sector of the building business, the project's goal is to be completed on schedule, within price, and while also meeting other goals. It is crucial for project managers to constantly watch and monitor the project by taking remedial action when necessary through a thorough evaluation of the plans. This will help the project stay on track and be completed on schedule while keeping costs under control. This study uses a Relative Importance Index (RII) to analyze the variables that contributed to cost overruns for 78 interviewees who worked for different building companies in the Vadodara, Gujarat, region's real estate market.

Keywords: Cost, Time, Optimization, material management, construction delay, cost overrun.

I. INTRODUCTION

India is the developing country and construction industry is one of the significant part plays very important role in infrastructure. Time and cost are two main factors of the construction for planning of any project. There are numbers of projects running cost overruns in India and thus it has given a rise to cost optimization techniques. As on date the Department of Statistics and Program Implementation oversees infrastructure projects valued at over INR 150 crore. Of the 1,673 such projects, 445 reported cost overruns and 557 were delayed. It has also been observed that project agencies fail to report revised cost estimates and activity schedules for many projects, suggesting that under reported cost/time overruns. Today, due to increase in the competition and the Indian capital, large construction of infrastructure cannot be carried out without the use of modern techniques, equipment, The project's contemporary management and strategies have shortened its completion time and cut its costs, all while keeping the quality at Indian standards. It is needed to use modern technology and techniques & tools to optimize the cost overrun and time.

Cost management is a sought-after tool to address issues with cost control, revenue analysis, planning, and budgeting, as well as assisting managers and engineers in making decisions, developing, and carrying out projects. Hence it is required to implement the cost management techniques in every stages and phases of a construction project with the available information of a project. Methodology is also plays vital roles in a successful completion of a project.

Although there are many variables that affect a project's expense, they can be roughly categorised under the following categories.

1. Material
2. Labour
3. Equipment
4. Overheads and Supervision

- 5. Profit Earned
- 6. Design and Specification

II. OBJECTIVES OF STUDY

The goal of this article is to serve as a framework for subsequent research, and the findings will contribute valuable knowledge to attempts to enhance cost management practises in the building sector.

- 1. To study Cost management for construction field.
- 2. To identify the factor affecting cost overrun of construction projects.

III. RESEARCH METHODOLOGY

A poll using an exploratory questionnaire was conducted to gather information from respondents who were actively engaged in the day-to-day operations of real estate building companies in Vadodara, Gujarat, India, in order to identify the variables that had the greatest impact on the project's cost increase. The questionnaire's form allows users to rate their responses using a Likert measure. Using Microsoft Excel, the relative importance index (RII) technique was used to analyse these statistics.

IV. DATA COLLECTION

To acquire statistically typical sample size of the community, following formulae 4.1 and 4.2 from “An introduction to statistical methods and data analysis” by Lyman Ott are used.

$$n = \frac{m}{1 + [\frac{m-1}{n}]} \dots\dots\dots (4.1)$$

Where the numbers n, m, and N, respectively, indicate the sample sizes for the accessible, restricted, and limitless populations. Here, m is determined using the algorithm shown below.

$$m = \frac{z^2 * p * (1-p)}{e^2} \dots\dots\dots (4.2)$$

Where,
 z = the figure used to determine the confidence level, which is 1.96 for a 95% confidence level and 1.645 for a 90% confidence level, respectively;
 p = the number figure that was calculated and
 e = the expected sampling variance. 0.5 was used in the sample size because the value of p is uncertain.

According to Gujarat Real Estate Regulatory Authority (RERA) there is total 2107 Real Estate Agent Registered and In Vadodara total 165 Agent Registered. Under RERA Total 10141 Projects are registered. In Which total 1899 Projects are in Vadodara.

The entire number that is currently accessible, according to Vadodara city and stakeholders, is 1899.

Thus, $m = \frac{1.645^2 * 0.5 * (1-0.5)}{0.1^2}$

$m = 67.65$

Here, 90% is used as the trust threshold. Now,

$$n = \frac{67.65}{1 + [\frac{67.65-1}{1899}]}$$

$n = 65.36$

N ≈ 66

Therefore, communication must be established with a minimum of 66 interviewees of building projects for this research. The selection of 78 building projects per respondent is taken into consideration to reduce the risk of non-response from the respondents and to represent better dependability and research advantages.

A total of 78 respondents from Vadodara city's real estate projects participated in the poll; of these, 19 were project managers, 20 senior project engineers, 18 project engineers, 5 proprietors, and the remaining respondents were project coordinators and planning engineers. Using the Relative Importance Index (RII) technique, the variables were ranked.

V. DATA ANALYSIS BY RELATIVE IMPORTANCE INDEX (RII) METHOD

The carefully gathered data was examined using the RII technique, which yields a Decimal value for each component known as its Relative Importance index.

These variables are ranked using this measure. Using the RII Method, a total of 78 variables were examined and ordered as shown in Table 1.

TABLE NO 1: RANKING OF FACTORS FOR COST MANAGEMENT

RANKING OF FACTORS BY RELATIVE IMPORTANCE INDEX (RII) METHOD		
NAME	RII	RANK
Cash flow management	0.862	1
Availability of Labour&Agency	0.849	2
leadership and efficiency insite management	0.836	3
Material shortages	0.831	4
Project duration	0.828	5
Availability of raw material	0.826	6
Team members with proper staff	0.823	7
Local material availability	0.821	8
Scheduling and monitoring of project	0.818	9
Tools & equipment shortage	0.815	10
Material testing and quality control	0.813	11
Coordination with subcontractors and agency	0.810	12
Financial status of stakeholders	0.805	13
Design complexity	0.795	14
Design changes	0.787	15
Improper material storages and space	0.774	16
Safety arrangements	0.772	17
Working space	0.769	18
Delay of drawings	0.762	19
HR Polices	0.754	20
Material wastage	0.749	21
Inspection Delay	0.744	22

Project surrounding	0.728	23
Temperature	0.721	24
Social culture	0.713	25
Excessive noise	0.700	26
Working 7 days without holiday	0.546	27

VI. CONCLUSION

The world's construction business is regarded as a crucial area because it advances and satisfies social objectives. The mindset of Contractors, Project Managers, Project Engineers, and Planning Engineers towards variables influencing Cost Management of building companies in the real estate industries of Vadodara city in the Gujarat region was evaluated using a questionnaire-based poll. A total of 100 surveys were given out, and 78 of them were returned. Of the respondents, 19 worked as project managers, 20 as senior project engineers, 18 as project engineers, 5 as proprietors, and the remaining respondents as project co-coordinators and planning engineers. The respondents were asked to rank each of the 27 cost management real estate industry variables in Vadodara, Gujarat, as having a very high, mid, little, or very little degree of influence. Results showed that cash flow management, workforce availability and agency, leadership and effectiveness in site management, material constraints, and project length are the factors that have the greatest impact on cost management for building companies. These are the main factors and to be considered on similar real estate projects of Vadodara city for optimizing of Cost-overrun of the project.

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