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## ANALYSIS OF SHORT COMINGS IN COST OPTIMIZATION TECHNIQUES AND DEVELOPING AN EFFECTIVE MODULE FOR ADOPTION



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### ABSTRACT :

The Cost is among the major considerations throughout the project management life cycle and can be regarded as one of the most important parameters of a project and the driving force of project success. Cost overrun is a very frequent phenomenon and is almost associated with nearly all projects in the construction industry. A thorough literature review was done and also expert opinions from developing countries were taken, through which a number of cost overrun causes were identified in global construction industry scenario. In number of factors were short-listed to be made part of the survey questionnaire and the survey was conducted with representatives from local general contracting firms. This study indicated that in which factor cost overrun occurred in the contractors financial difficulty. Result indicated the majority of cost overrun factor in lack of cash flow, and also it give the awareness and it will not happen in future projects.

**KEY WORDS:** Cost Overrun, Construction Industry.

## 1. INTRODUCTION:

The construction industry plays a pivotal role in developing the country's infrastructure, a pre-requisite for high levels of economic growth. In recent years there has been a great need for an understanding of construction economics and cost control, particularly during the design stage of projects and in their execution period. A cost management process becomes inevitable that estimates, monitors, predicts, and reports project cost. Many projects all over the world have suffered from cost and time overruns due to factors ranging from poor cost control during the design and project implementation stages. The Indian construction industry is an integral part of country's economy and its growth and a conduit for a substantial part of India's development investment. Construction projects are subject to numerous constraints of various types, including contractual due dates, resource limitations, and safety, financial, and managerial constraints. Hence a better methodology of optimization of cost and analysis of the factors which affect the project negatively and thereby applying efficient cost optimization techniques based on proper scheduling. As with construction industry anywhere in the world, the Indian construction sector also faces a lot of challenges from land acquisition issues, adverse political and structural changes, shortage of talent, design and constructability issues, and rising material and labor costs.

## 2. CAUSES OF COST OVERRUN

Based on the previous study, the basic factors leading to cost overrun can be generalized into

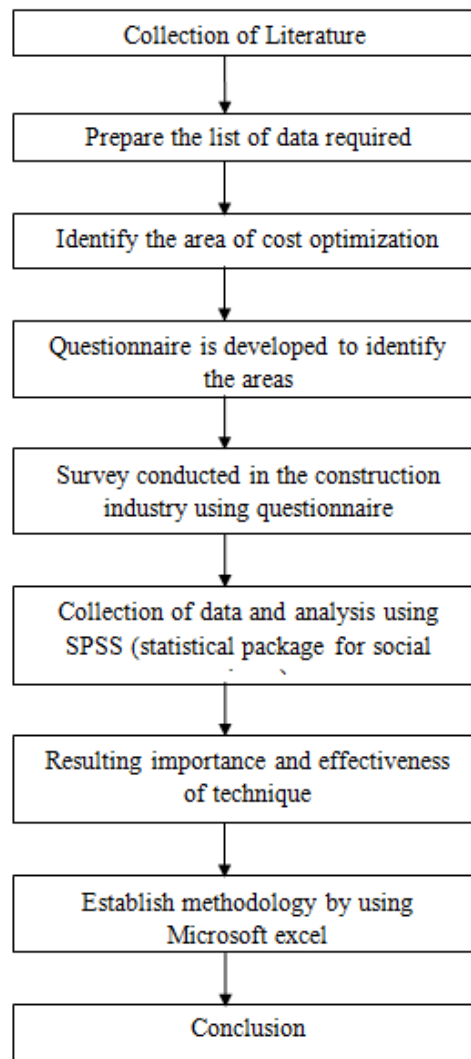
- Client-related factors.
- Contractor- and supplier-related factors, and
- External factors.

Client-related factors include late payments, approval delays, changes to work and design, technical definition, client representation, design delays, decision-making and internal skills shortages. Contractor- and supplier-related factors include skills shortages, time and resource planning and coordination, subcontractors, site management, and labor productivity.

External factors include delay in financing, statutory approvals, unpredictable site conditions, escalation and inflation, and shortages of material.

### 3. METHODOLOGY

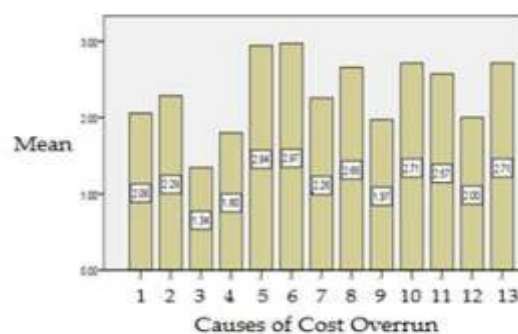
The steps involved in the project are as shown below



### 4. RESULT AND DISCUSSION

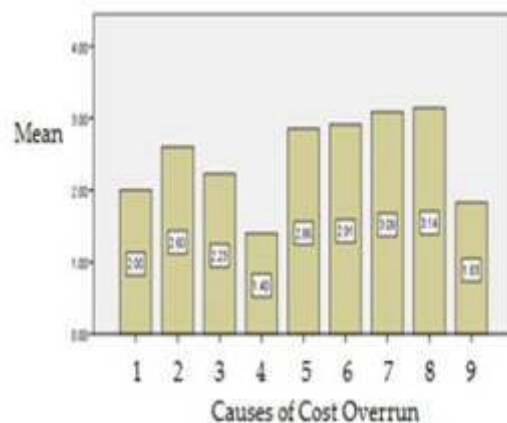
The Analysis is based upon the survey. The analysis and interpretation of data are highlighted with certain relation between the results. The analysis of data is done to rank various factors involved in the various stages of cost optimization.

#### 1. Factors related to construction practices



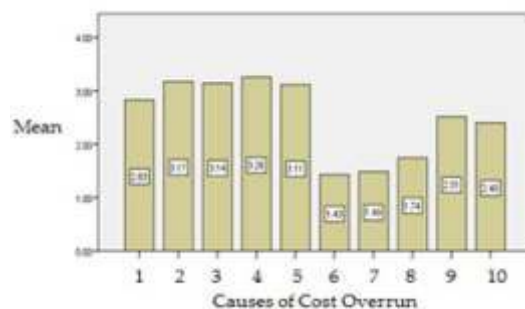
1. Poor contract management
2. Practice of assigning contract to lowest bidder
3. Delay in work awarding after tendering
4. Contract and specification interpretation disagreement
5. Slow decision making
6. Poor schedule management
7. Lack of proper training and experience of staffs
8. Non-performance of sub-contractors
9. Lack of knowledge of clients and consultants
10. Poor monitoring and control
11. Slow response to site queries
12. Poor performance of labours
13. Delay in approval of work done

## 2. Factors related to construction times



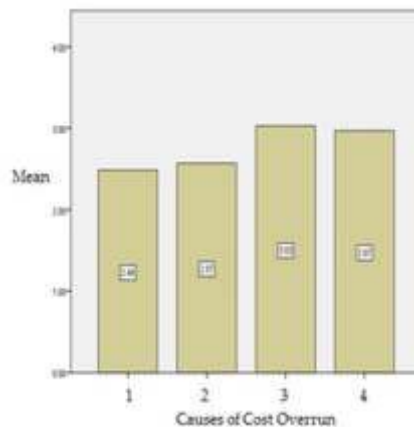
1. Large size of contract
2. Inadequate specification
3. Complexity/Uncertainty of projects
4. Frequent design changes
5. Poor design/delay in providing design
6. Poor material management
7. Inadequate/insufficient equipment, tools and plant
8. Frequent breakdown of construction plants and equipment
9. Rework due to wrong work

## 3. Financial factors



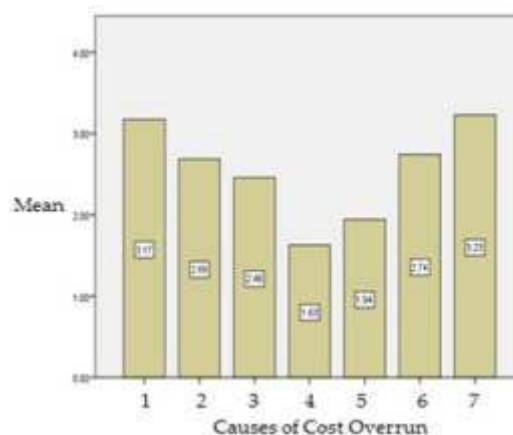
1. High interest cost/ rate
2. Lack of financial planning
3. Financial status of client
4. Contractors financial difficulty
5. Increase in material/ machine price
6. Increase in taxes
7. Delayed payment to contractors/subcontractors and suppliers
8. Inflation of resources
9. Quality control leading to variation in cost
10. Effective cost control measures

#### 4.Environmental factors



1. Bad weather conditions
2. Unexpected site conditions
3. Accidents occur during work progress
4. Unfavourable location of project

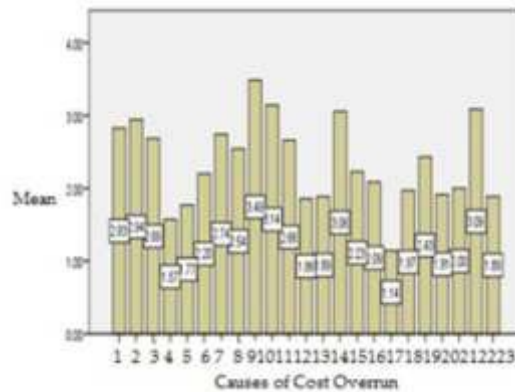
#### 5.Other factors



1. Efficiency of manpower
2. Safe work practices
3. Quality and efficiency of resources
4. Wrong procurement of materials

5. Rework due to change in government policies
6. Government lag in approving plans
7. Improper acquisition of land by owners causes delay

#### 6. Complexity of project type



1. Location of projects
2. Wrong construction methods
3. Mistakes during construction
4. Necessary variations of project
5. Disputes in construction sites
6. Embezzlement of top management
7. Poor estimation of resources
8. Improper clarity in drawing & specification
9. Lack of cash flow
10. Labour productivity
11. Lack of awareness of IS codes
12. Lack of knowledge about the market conditions
13. Delay penalties
14. Flow of cash
15. Increasing cost of labours and other resources
16. Lack of fund and attrition
17. Completing whole budget under the estimated budget
18. Lack of coordination between staff and labours
19. Lack of coordination between management and staff
20. Clients lack of exposure to changing trends
21. High expectation of clients
22. Shortage of labours
23. Lack of inventory management

The causes of cost overrun, ranked by all the responses from the questionnaire survey are mentioned in below table. The probability of occurrence were mentioned are taken from the above six bar graphs which are analysed using SPSS and the following results obtained. The ranks are given in order, according to the probability of occurrence value for each cause. The mean values are taken in ascending order and ranks are given.



S.NO.	CAUSES OF COST OVERRUN	PROBABILITY OF OCCURENCE	RANK
1	Poor schedule management	2.97	6
2	Frequent breakdown of construction plants & equipment's	3.14	4
3	Contractors financial difficulty	3.26	2
4	Accidents occur during work progress	3.03	5
5	Improper acquisition of land by owners causes delay	3.23	3
6	Lack of cash flow	3.49	1

## 5. CONCLUSION

A construction project is a high value, time bound, special construction mission of creating a construction facility or service, with predetermined performance objectives like quality specification, completion time, budgeted cost and other specified constraints, hence a cost management process becomes inevitable that estimates, monitors, predicts, and reports project cost thereby meeting all the possible deficiencies which are likely to occur.

The key issues and challenge faced in the study was to optimize the scheduled by stating the right people and equipment at right place, right time, and right purpose using optimised costing techniques in order to gain the maximum profit within the designated period and desired quality of work. The results obtained from the analysis of causes shows that the factors which is the most critical are increase of material price and another thing poor schedule management and lack of financial planning and increase in the rate of resources namely labor, material and machinery. Effective planning and estimation of project time and cost is paramount important to a contracting organisation, as the ability to establish an optimal time-cost equilibrium for a project could improve the chance of underbidding its competitors while attaining the greatest profitability in a competitive environment. As far as any construction project is concerned, there has to be a strong idea on what measures are to be considered in order to maximise the desired factors and minimise the undesired ones.

Construction projects are subject to numerous constraints of various types, including contractual due dates, resource limitations, and, financial, and managerial constraints. Hence a better methodology of optimisation of cost should be identified and the analysis of the factors which affect the project negatively should be properly scheduled and implemented.

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