

Factors Contributing to Project Cost in the Building Construction

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Abstract: Major problem in the building construction industry is that building contracts are completed at much higher than estimated cost, there for identify factors contributing to project cost is very important in the building construction industry.

Keywords: Cost, Building

1. Introduction

A successful project means that the project has to be accomplished with technical performance, maintained its project schedule and remained the project has completed within the budgetary costs. However, there has been a greater awareness of factors influencing construction cost, building clients because of the prevailing economic conditions which has placed severe restrictions on the availability of money and thus made it essential to ensure that whatever amount is available is judiciously utilized to secure best economic advantage. According to construction engineering and management, the crucial part of a construction project represents its construction cost. Therefore, for a better awareness, evaluation and feasibility study of a construction project cost, all cost - associated parameters have to be analyzed prior to the analysis of the final construction cost. The construction project duration is represents the most effective parameter in the project cost of building construction. However, accurate and feasible studies of construction projects are not simple to do since there have been many factors varying from one project to another such as: volume of project, type of project, location of project, season of the year, type of material, structure, and method of construction. Therefore, in this study is an attempt to identify the factors influencing building construction project.

2. Research Objectives

This study, factors influencing building construction cost and are analyzed and discussed through ranking. Design-bid-build projects, both executed by governmental or private companies and selected in an open tendering are selected for the scope of this study. The main objectives of this study are to identifying factors influencing the accuracy of the building construction projects, and cost estimating process.

3. Methodology

A questionnaire was developed to participate of General Manager, Project Manager, Contractor, Supervisor, Site Engineer to Rank the cost overrun factors according to

importance and their effect. The questionnaire has been conducted around of main 80 factors which affect the cost in construction projects. The questionnaire survey is conducted by 50 construction projects in Wayanad. In this survey the response rate of supervising Engineer is 48%, Contractor is 24%, Project manager is 16%, General manager is 10% and other respondents is 2%. There for in my surveying most of the responding peoples are Supervising Engineers. Summary of relative importance index for factors affecting the performance of building construction projects. Identified 80 factors of performance on a five-point Likert scale as: not important, slightly, moderately, very important, and extremely important. Relative importance index is calculated for every factor using the following formula:

$$RII = \frac{\sum W}{A * N}$$

Where,

W is the weight given to each factor by the respondents and ranges from 1 to 5;

A is the highest weight = 5;

N is the total number of respondents.

4. Factors Influencing Performance of Construction Project

Table 1 shows the RII value and rank of Design related factors, Table 2 shows the RII value and rank of Time/ Cost related factors, Table 3 shows the RII value and rank of Parties experience related factors, Table 4 shows the RII value and rank of Financial issues related factors, Table 5 shows the RII value and rank of Bidding situations related factors, Table 6 shows the RII value and rank of Project characteristics related factors, Table 7 shows the RII value and rank of Estimating process related factors.

Table 1: RII value and rank of Design related factors

S no	Factors that determine cost of building project	RII Value	Rank
i) Design related factors			
DF1	Level of specialization required of contractors	0.79	1
DF2	Design completion when budget is fixed	0.78	2
DF3	Level of design complexity	0.77	3
DF4	Level of construction complexity	0.77	3

DF5	Design completion(by owner) when bids are invited	0.77	3
DF6	Type of specification	0.77	3
DF7	Presence of special issues	0.75	4
DF8	Extent to which bid documents allow additions to scope	0.74	5
DF9	Project scope definition completion when bids are invited	0.74	5
DF10	Design Decision made (by owner) when bids are invited	0.74	5
DF11	Flexibility of scope of works when contractor is hired	0.64	6
DF12	Level of technological advancement	0.62	7
DF13	Percentage of repetitive elements	0.62	7

Table 2: RII value and rank of Time/ Cost related factors

Sno	Factors that determine cost of building project	RII Value	Rank
ii) Time/ Cost related factors			
TF1	Consultant's level of construction sophistication	0.78	1
TF2	Importance for project to be delivered	0.78	1
TF3	Time given to consultant to evaluate bids	0.77	2
TF4	Owner's level of construction sophistication	0.77	2
TF5	Importance for project to be completed on time	0.77	2
TF6	Extent to which contract period is allowed to vary	0.75	3
TF7	Bidding environment	0.65	4
TF8	Importance for project to be completed within budget	0.64	5

Table 3: RII value and rank of Parties experience related factors

S no	Factors that determine cost of building project	RII Value	Rank
iii) Parties experience related factors			
PF1	Consultant experience with similar project	0.79	1
PF2	Communication among project team	0.79	1
PF3	Owners experience with similar project	0.78	2
PF4	Contractor track records for completion on quality	0.78	2
PF5	Contractor prior working relationship with consultant	0.78	2
PF6	Subcontractor experience and capability	0.77	3
PF7	Contractors experience with project in Wayanad	0.75	4
PF8	Adequacy of contractor plant and equipment	0.75	4
PF9	Magnitude of change orders in contractor past project	0.75	4
PF10	Contractor track record for completion on time	0.74	5
PF11	Contractor track record for completion on budget	0.74	5
PF12	Owners staffing level to attend to contractor	0.70	6
PF13	Consultant staffing level to attend to contractor	0.64	7
PF14	Contractor's prior working relationship with the owners	0.64	7
PF15	Contractor's experience with similar type of projects	0.63	8
PF16	Contractor staffing level	0.62	9
PF17	Contractor's experience with similar size of project	0.62	9

Table 4: RII value and rank of Financial issues related factors

S no	Factors that determine cost of building project	RII Value	Rank
iv) Financial issues related factors			
FF1	Availability of management and finance plans	0.78	1
FF2	Uncertainty of taxes	0.78	1
FF3	Inflation pressure	0.77	2
FF4	State of market	0.77	2
FF5	Accuracy of estimated financing cost	0.75	3
FF6	Economic instability	0.74	4
FF7	Periodical payments	0.64	5
FF8	Currency exchange fluctuation average	0.62	6

Table 5: RII value and rank of Bidding situations related factors

S no	Factors that determine cost of building project	RII Value	Rank
v) Bidding situations related factors			
BF1	Level of competition	0.78	1
BF2	Time between project announcement and bid opening average	0.77	2
BF3	Accuracy of bidding documents provided by client	0.74	3
BF4	Number of competitors	0.64	4

Table 6: RII value and rank of Project characteristics related factors

S no	Factors that determine cost of building project	RII Value	Rank
vi) Parties experience related factors			
CF1	Knowledge of client and consultant average	0.80	1
CF2	Site condition	0.79	2
CF3	Religious regulations	0.79	2
CF4	Environmental issues	0.78	3
CF5	Public exposure	0.78	3
CF6	Contract period	0.78	3
CF7	Unforeseeable change in local laws and procedures	0.78	3
CF8	Social and cultural impact	0.77	4
CF9	Project location	0.77	4
CF10	Quality of firm's project planning and management	0.77	4
CF11	Arbitration clause	0.77	4
CF12	Impact of project schedule	0.77	4
CF13	Punitive damages	0.76	5
CF14	Size of contract	0.75	6
CF15	Nationality of labor	0.75	6
CF16	Labor and equipment required	0.75	6
CF17	Quality of specification code	0.74	7
CF18	Experience and incentives of field staff	0.72	8
CF19	Estimating method	0.71	9
CF20	Weather	0.68	10
CF21	Competent and leadership of project manager	0.64	11
CF22	Attitude towards changes	0.64	11
CF23	Content of the project specifications	0.62	12
CF24	Type of contract	0.62	12

Table 7: RII value and rank of Estimating process related factors

S no	Factors that determine cost of building project	RII Value	Rank
vii) Estimating process related factors			
EF1	Availability of cost indexes average	0.79	1
EF2	Standard procedure for updating cost information	0.78	2
EF3	Availability of productivity standards	0.77	3
EF4	Ability of estimating team	0.76	4
EF5	Method used in determining contingency	0.64	5
EF6	Relevant experience of estimating team	0.63	6

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5. Result and Conclusion

A questionnaire- survey was conducted to find the response of general manager, project manager, contractor, supervisor, site engineer towards factors affecting the cost of building construction project. 80 factors are to be considered and distributed to the respondents. The most important factors agreed by the general manager, project manager, contractor, supervisor, site engineer as in the building construction projects are : Level of specialization required of contractors, Consultant's level of construction sophistication, Importance for project to be delivered, Consultant experience with similar project, Communication among project team, Availability of management and finance plans, Uncertainty of taxes, Level of competition, Knowledge of client and consultant average, Availability of cost indexes. Position of rank in the above is 1. These are the major factors affecting the building construction cost.

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