

Evaluation of Critical Success Factor in Construction Projects

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Abstract- The development and growth, particularly for developing countries depends on successful implementation of new projects. The construction industry in India is the second largest industry next to agriculture in terms of providing employment. The construction industry is dynamic in nature due to the increasing uncertainties in technology, budgets, and development processes. Unfortunately, some projects were completed successfully but some were not completed on time, over budget or being cancelled. Nowadays, building projects are becoming much more complex and difficult. The project team is facing unprecedented changes. The study of project success and the critical success factors (CSFs) are considered to be a means to improve the effectiveness of project.

Index terms- Survey Questionnaire, Data analysis, Ranking Method

INTRODUCTION

GENERAL: The development and growth, particularly for developing countries depends on successful implementation of new projects. The construction industry in India is the second largest industry next to agriculture in terms of providing employment. The construction industry is dynamic in nature due to the increasing uncertainties in technology, budgets, and development processes. Unfortunately, some projects were completed successfully but some were not completed on time, over budget or being cancelled. Nowadays, building projects are becoming much more complex and difficult. The project team is facing unprecedented changes. The study of project success and the critical success factors CSFs are considered to be a means to improve the effectiveness of project.

Objectives: To study of the critical factors that lead to project success in the Gujarat construction industry to

enable parties to rapidly assess the possibility of a successful project from their viewpoint.

- To improve the key factors affecting on different Residential projects and their behaviour
- Lack of planning
- Lack of construction method
- Lack of experts
- To evaluate the critical factor affecting the delay

Scope of Study

- Investigation of the most important critical success factors for Gujarat construction industry, based on accumulative knowledge and judgment of experts by RII, FI method (owner/owner representative, consultant, and contractor) in the construction industry and suggesting remedial measures
- Project can complete in given time or before schedule time

Problem summary: - The study of the project success and the CSF is considered to be a mean for improving the effectiveness of project. Thus the project managers need proper understanding of critical success factors and how to mitigate them. The purpose of this study is to systematically investigate the causes for project success. Constructions projects are frequently influenced by success factors. It can help construction companies to reach their intended goals with greater efficiency. Most of the critical success factors such as factors related to project manager's performance, factors related to organisation, factors related to project, factors related to external environment are likely to apparent from this study. This study ful to identify factors that influence project success.

Frame work of Critical success factors:

Cost factors	Time factors	Quality factors	Health, Safety & environment factors	Productivity factors	Client - related factors
A1: Market share of organization	B1: Site preparation time	C1: Unavailability of competent staff	D1: Safe condition of environment	E1: Project complexity	F1: Client's experience
A2: Liquidity of organization	B2: Planned time for construction	C2: Quality of equipment & raw materials	D2: Accidents occur	E2: Number of new project / year	F2: Owner's clear & precise definition of project scope & objectives
A3: Cash flow of project	B3: Percentage of orders delivered late	C3: Quality assessment system in organization	D3: Application of health & safety in organization	E3: Management labour relationship	F3: Timely decision by owner / owner's representative
A4: Profit rate of project	B4: Time needed to implement variation orders	C4: Quality training / meeting	D4: Air quality	E4: Absenteeism rate through project	F4: Client's emphasis on low construction cost
A5: Overhead percentage of project	B5: Time needed to rectify	C5: Conformance to specification	D5: Noise level	E5: Sequencing of work according to schedule	F5: Client's emphasis on high quality of construction
A6: Project design cost	B6: Average delay in claim approval	C6: Waste around site	D6: Climate condition	E6: Information Coordination between owner & information parties	F6: Client's emphasis to achieve time limit
A7: Material & equipment cost	B7: Average delay in regular payments	C7: Leadership skills for project manager	D7: Number of disputes between owner & project parties	E7: Client's emphasis to achieve time limit	
A8: project labour cost					
A9: project overtime cost					
A10: Cost of rework					
A11: Cost of variation orders					
A12: Waste rate of material					
A13: Regular project budget update					
A14: Escalation of material / price					

N = total number of respondents

Frequency index:

The Factors Affecting Success of Construction Project of occurrence index method (FI) was used here to determine owners, consultants, and contractors perceptions of the frequency of the identified success factor.

$$\text{Frequency Index (F.I.) (\%)} = \sum a (n/N) * 100$$

Severity index:

A formula is used to rank causes of delay based on severity as indicated by the participants

$$\text{Severity Index (S.I.) (\%)} = \sum a (n/N) * 100$$

Importance index:

The importance index of each cause is calculated as function of both frequency and severity indices, as follows

$$\text{Importance Index (\%)} = [F.I. * S.I.]/100$$

Summary of expert review:

COST FACTORS	TIME FACTORS	QUALITY FACTORS	HEALTH, SAFETY & ENVIRONMENT FACTORS	PRODUCTIVITY FACTORS	CLIENT-RELATED FACTORS	CONTRACTOR RELATED FACTORS	RESOURCE RELATED FACTORS
A1: Market share of organization	B1: Site preparation time	C1: Availability of competent staff	D1: Safe condition of environment	E1: Project complexity	F1: Client's experience	G1: Trainee & experience team	H1: Land acquisition
A2: Liquidity of organization	B2: Planned time for construction	C2: Quality of equipment & raw materials	D2: Accidents occur	E2: Number of new project / year	F2: Owner's clear & precise definition of project scope & objectives	G2: Contractor client relationship	H2: Availability of construction material
A3: Cash flow of project	B3: Percentage of orders delivered late	C3: Quality assessment system in organization	D3: Application of health & safety in organization	E3: Management labour relationship	F3: Timely decision by owner / owner's representative	G3: Skill & experience of contractor	H3: Availability of equipment
A4: Profit rate of project	B4: Time needed to implement variation orders	C4: Quality training / meeting	D4: Air quality	E4: Absenteeism rate through project	F4: Client's emphasis on low construction cost	G4: Contractor labour relationship	H4: Escalation of material
A5: Overhead percentage of project	B5: Time needed to rectify	C5: Conformance to specification	D5: Waste around site	E5: Sequencing of work according to schedule	F5: Client's emphasis on high quality of construction	G5: Contractor labour relationship	H5: Shortage of manpower
A6: Project design cost	B6: Average delay in claim approval	C6: Leadership skills for project manager	D6: Climate condition	E6: Information Coordination between owner & information parties	F6: Client's emphasis on high quality of construction	G6: Contractor labour relationship	H6: Project labour cost
A7: Material & equipment cost	B7: Average delay in regular payments	C7: Leadership skills for project manager	D7: Number of disputes between owner & project parties	E7: Client's emphasis to achieve time limit			
A8: project labour cost							
A9: project overtime cost							
A10: Cost of rework							
A11: Cost of variation orders							
A12: Waste rate of material							
A13: Regular project budget update							
A14: Escalation of material / price							

CONCLUSION

Based on value of RII & FI we can rank the factor as per their importance and frequency of occurrence for completion of project successfully.

In accordance with the most important factors contractors should recommend the availability of material, equipment's and also quality of materials should be of a greater interest for contractors in order to improve cost, time, and quality performance. This can be done by applying quality training and meetings that are necessary for performing an improvement. Apparently the least important factors can prove to be guidelines for its consideration and effects on project success rate.

Outcome of this study can be useful to construction stakeholders like, contractors, developers & clients. To put emphasis on highly ranked factors out of above list which can help to achieve highly success rate of the project in terms of timely completion along with quality & cost

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SURVEY QUESTIONNAIRE

Relative importance index:

The Factors Affecting Success of Construction Project relative importance index method (RII) was used here in to determine owners, consultants, and contractors perceptions of the relative importance of the identified success factors.

$$RII = \sum w A X N$$

RII = relative importance index

W = weight given by the respondents (1 – 5)

A= highest weight (5)

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