

EVALUATION OF FACTORS INFLUENCING CHANGE MANAGEMENT FOR CONSTRUCTION PROJECT BY SPSS TOOL

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Abstract: Changes in construction projects are inevitable. In order to minimize the impact of changes on a project, it is imperative to implement change management. To achieve the objective, a comprehensive literature review was conducted to gain an in-depth understanding of change management, and a questionnaire survey was conducted and data were analysed using the SPSS tool. The analysis results establish that the implementation status in the construction industry is relatively low while improvement in project cost, time and quality performances achieved by the companies that implemented change management. Recognizing the implementation status, importance and factors causing change will be helpful for effective project management and will be a starting point to reduce changes that negatively affect project performances, ultimately allowing the construction industry to increase opportunities for project success.

Keywords: Change, Change management, Cost, Schedule, Quality, Performance, Construction project.

I. Introduction

Change is defined as “the act or an instance of making or becoming different, an alteration or modification”. Any additions or deletions to project goals or scope are considered to be changes, whether they increase or decrease the project cost, schedule or quality. Change Management occurs in construction at two levels: organisational and project level. Throughout a project, construction organisations are faced with many changes, most of which are design changes. A detailed explanation of change management, and how they could affect the project’s priorities, as well as how to develop planning to adjust with those changes, in addition to controlling and monitoring the required modifications. It is also important to identify different sources of project changes before attempting to minimize it. Project changes can be originated from numerous factors that are related to the construction projects. Construction changes refer to work state, processes, or methods that deviate from the original construction plan or specification. They usually result from work quality, work conditions or scope changes. The impacts and consequences of changes on an organization and people vary according to the type and nature of changes, but most importantly according to how they are managed. The changes are to be managed to maximize the benefits, minimize the penalties.

What are the benefits: Greater transparency and control of project issues and changes? Higher productivity of team members, with more time spent on value-added tasks. Increased project profitability due to reduced percentage of unapproved changes. More-profitable projects and reduced project risks through optimized processes.

II. PROBLEM STATEMENT

As per literature review it has been observe 74% of construction projects goes through change. Throughout a project, construction organisations are faced with many changes, most of which are design changes.

The impacts and consequences of changes on an organisation and people vary according to the type and nature of changes (usually project delay, cost over-run, dispute et. al.), but most importantly according to how they are managed to maximise the benefits and minimize the penalties.

The main objectives of this study are summarized as the following: 1) To identify the most important causes of change in construction project, 2) To develop the model to mitigate the negative effect on project performances due to change.

III. FACTORS AFFECTING CHANGE MANAGEMENT

To identified variables which affect to change management in construction through literature and survey. These factors are divided into 4 categories- factors related to project, factors related to design, factors related to site staff, factors related to risk.

Sr. no.	FACTORS	DISCRIPTION
A	Factors related to Project	
A1	Scope of the project (type and nature)	Project scope is the part of project planning that involves determining and documenting a list of specific project goals, deliverables, tasks, costs and deadlines.
A2	Location of the project	The place where a structure or group of

		structures was, is, or is to be located
A3	Period of the project	The stage when project construction ends
A4	Project size	Project scale measured by its estimated value
A5	Quality level of project	High, low, moderate quality required
A6	Project methodology	Best practices and methods
A7	Expected performance of project	Standard of measurement by which efficiency, progress
A8	Available resources of project	People, equipment, facilities, funding, or anything else capable of required for the completion of a project activity
A9	Project completion at estimated time	The time and or effort required to complete a project activity
A10	Non-delay of interim payments	Non-payment of interim payment to Contractors has been a major issue in ... getting paid or the payments have been unduly delayed by the Employer.
B	Factors related to design	
B1	Requirements of Design	The owner has unclear requirement of drawing, detail specification.
B2	Duration	If prepare design for the project is taking much time, than time overrun problem is occur
B3	Experience & Knowledge	A designer has a good knowledge and experience about the Project. Therefore quality Maintain Perfectly.
B4	Designer's Responsibilities	Standard for determination the level of Designer's Responsibilities
B5	Coordination & Communication	Coordination & Communication among design parties. So Parties involve in the project easily explain the detail of Project.
B6	Specification	Procedures and Specification which have been pre-Worked for Standard implementation must be followed effectively.
B7	Incomplete drawings	Drawings may or may not include dimensions and notes, and even when theyprogress of a building during its construction
C	Factors related to site staff	
C1	Cooperation between Supervision and Contractor's staff	There can be ... will need to decide on levels of cooperation, consultation and supervision between all parties to ensure compliance with legislation.
C2	Understanding of contract administration by Supervision	Understand and implement effective inspection procedures.
C3	Skill and experience of Contractor's staff	This means that it is important to be able to second or recruit additional staff, and to Contract management skills and experience.
C4	Experience	Low Experience and competency of project manager is affect the quality of construction
D	Factors related to risk	
D1	Risk avoidance /allocation	Entails eliminating hazards, activities and exposures that place an organization's valuable assets at risk
D2	Responsibility allocation	Sharing of responsibility
D3	Disputes & arbitration	private, judicial determination of a dispute by an independent third party
D4	Lack of coordination	A failure to exchange information

IV. METHODOLOGY

A two-stage research methodology was adopted: First, literature survey and interviews with contractors in the Surat were conducted to identify factors affecting the change management for construction projects. These semi-structured interviews were regarded as pilot study to adjust and modify the questionnaire manuscript before take it to contractor.

Second, a questionnaire methodology was adopted to evaluate and rank these factors according to their influence and significance to change management for construction projects. The questionnaire survey was conducted by contractor in the Surat. The questionnaire quantitative data analysis was done mean score method by using the SPSS tool.

V. DATA COLLECTION

The primary data collected from the first part of the questionnaire was analysed from the perspective of different class of contractors. The total 182 number of respondents comprises of 14 class-AA, 10 class-A, 9 class-B, 22 class-C, 32 class-D, 78 class-E1 and 17 class-E2 who participated in this field survey. The responses of them were taken for this analysis.

Class of Contractor	Numbers of Contractor	Responses Returned	Responses %
AA	25	14	56
A	17	10	58.82
B	16	9	56.25
C	39	22	56.41
D	55	32	58.18
E1	135	78	57.77
E2	29	17	58.62
TOTAL	316	182	57.59

VI. DATA ANALYSIS

A. Overall top 10 Ranking by Mean score method using SPSS tool

The mean score is computed for each change management factors to identify the most significant factors. The change management factors are ranked based on mean value. From the ranking assigned to each change management factor, it is possible to identify the most important change management factors that affect the project in construction industry.

CODE	FACTORS	MEAN	RANK
A10	Non-delay of interim payments	4.5495	1
A2	Location of the project	4.3297	2
B2	Duration	4.2912	3
A8	Available resources of project	4.2473	4
C1	Cooperation between Supervision and Contractor's staff	4.1868	5
A3	Period of the project	4.1209	6
A7	Expected performance of project	4.0714	7
A4	Project size	4.0659	8
D2	Responsibility allocation	3.9615	9
B1	Requirements of Design	3.9341	10

VII. CONCLUSION

The conclusions drawn from this study are as follows:

As per structural interview the result says that change management process was 90% agreed by the experts. As per structural interview the definition "change" in construction project was 70-80% occur by the expert view. Based on the analysis result importance of change management in improving project performance factors:

- Factor related to Project
- Factor related to Design
- Factor related to Site staff
- Factor related to Risk

The industry must get through to appreciate more benefits from implementation of change management. Furthermore, more cost and time savings, and quality improvement could be achieved by the group practicing change management. To assess the importance and impact of change management in terms of project performances. Changes of organizations are to be managed more frequently.

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