

Application of Value Engineering in Construction Project to Predict Time and Cost Overrun – An Overview

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ABSTRACT:

This study examines previous literature on construction projects cost and time overrun, with the specific aim of identifying the factors affecting the cost and time overrun in a construction project. The cost and time overrun have voiced more attention in recent years of major construction projects. This research was carried out to identify the causes leading to cost and time overrun in construction projects. The study is conducted with reference to existing theoretical literature and published papers. This study is mainly a literature review/survey on the causes of construction projects cost and time overruns. The primary findings emanating from the study revealed the important factors which cause project cost overruns, such as escalation of material cost, plant and equipment cost, poor design/delay of providing designing, non-performance of sub contractors, planning and scheduling deficiencies, political situation, constructability problems and design approval. The study further revealed the important factors which cause project time overrun, such as mode of financing, payment for completed work, land acquisition, equipment erection, low speed of decision making, inadequate resources due to contractor, improper planning, too many change orders from the owner and ineffective planning & scheduling. This study explores the causes of

Construction projects cost and time overruns and presents a staunch background on the theories of construction project cost and time overruns.

Keywords - *cost overrun, time overrun, construction project, causes of cost and time overruns.*

1. INTRODUCTION:

Cost and time overrun can occur for a variety of reasons on various types of projects which led to the contention on how to minimize these construction projects cost and time overrun by Alinaitwe, Apolot and Tindiwensi. Ashwini and rahul stated that construction delays are considered to be one of the reputed problems in the construction industry and it has an unfavorable effect on project success in terms of time, cost and quality. Shreenaath, Arunmozhi and Sivagamasundari stated that it was essential to analyze the cost that might result in claims and disputes, the link between the actual task undertaken, the time required to complete them, and the ultimate cost estimate of the resource involved in the projects.

2. CONSTRUCTION PROJECT COST OVERRUN:

Estimation of project cost at the early stages of the design process and the ability to manage these costs throughout the construction phase is paramount to a project's overall success (Hemanata). Effective control of budget, there are several methods used in construction industry worldwide, which can help the practitioners in controlling the problems of budget overrun (Aftab and Ismail). Cost is among the major consideration throughout the project management life cycle. It can be regarded as one of the most important parameters of the project (Nida ,Rizwan &Syed).

3. CAUSES OF CONSTRUCTION PROJECT COST OVERRUN:

Nida Azhar et al. (2008) conducted a study to identify the major cost overrun factors in construction industry by considering 42 factors. The top cost overrun factors were: fluctuation in price of raw materials, unstable cost of manufactured materials, and high cost of machineries, lowest bidding procurement procedures and poor project management/poor cost control.

Aftab & Ismail (2013) identified the essential factors that affect the budget overrun issues in construction project of southern part of Malaysia. The study illustrated that the top affecting factors include: material cost, plant & equipment cost, labour cost, construction cost and sub-contractor cost.

Hemanta (2013) concluded that the main causes of cost overruns in construction projects were: planning and scheduling deficiencies, methods of construction, effective monitoring and feedback

process, complexity of design and construction and improper control over site resources allocation.

Ibrahim & Nabil (2013) conducted a study to investigate the risk leading to cost overrun from contractor perspective. 41 factors were considered in this study. The most severe factors were political situations, fluctuation of prices of materials, economic instability and currency exchange, level of competitors and previous experience of contract.

Gul Polat et al (2014) conducted a study to identify the factors affecting cost overrun in micro scaled construction companies. 38 factors were identified. They concluded that the top affecting factors were design problems, delays in receiving progress payments, high inflation rate and mistakes in estimation, frequent changes orders and extra work not included in the work.

Subramani et al.(2014) concluded that the top factors affecting construction cost are slow decision making, poor schedule management, increase in material/machine price, poor contract management, poor design/delay in providing design and land acquisition.

Shreenaath et al. (2015) conduct a study to predict the top most factors affecting the construction cost overrun in Tamil Nadu. 54 factors were identified. The top ranked factors were: escalation of material price, poor quality of construction materials, poor site management and supervision, unqualified / inadequate experienced labour and shortage of equipment.

4. CONSTRUCTION PROJECT TIME OVERRUN:

Delay means a time overrun either beyond the contractor date or beyond the date that the parties have agreed upon for the delivery of the project. Hence, Ashwini defined the delay as the extension of time in the completion project, in short delay means failure to complete project in targeted time and budgeted cost as agreed in contract. Time overrun is defined as the lapse between the agreed completion date and the actual date of completion Augustine & Mangyvat. Delay could be defined as the time overrun either beyond completion date specified in a contractor or beyond the date that the parties agree upon for delivery of a project Divya & Ramya.

5. CAUSES OF CONSTRUCTION PROJECT TIME OVERRUN:

Augustine & Mangyvat (2001) considered 23 factors to carry out a study to identify the time overrun factors in Nigerian construction industry. They concluded that the top ranked factors were: mode of financing and payment for completed work, improper planning, underestimation of time, frequent changes in design and materials, noncompliance with the condition of contract and poor site management.

Sugiharto & Keith (2003) show that slow in making decision, design changes, lack of trade skill, inappropriate construction methods, poor coordination among project participants, poor planning and scheduling, delay of material delivery to site, inexperienced inspectors, misuse of materials and slow drawing revision and distribution are top ten causes of delays in construction project.

Tommy et al. (2006) carried out a study to identify construction delays in Hong Kong civil engineering projects by considering 30 factors. The top ranked delays were inadequate resources due to contractor, unforeseen ground condition, exceptionally low bids, inexperienced contractor, works in conflicts with existing utilities, poor site management & supervision by consultant and unrealistic contract duration imposed by clients.

Sweies et al. (2008) identified 40 factors affecting the delays in construction project. They concluded that financial difficulties faced by the contractor, too many change orders from owner, poor planning scheduling of the project by the contractor, shortage of technical professionals in the contractor's organization, presence of skilled labours and ineffective quality control by the contractor.

Saleh et al. (2009) concluded that the main causes of delays in construction industry in Libya. 45 factors were considered. They found that the top affecting factors are improper planning, lack of effective communication, design errors, shortage of supply (steel, concrete, etc) slow decision making, financial issues, shortage of materials, cash flow problems during construction and increase in quantities.

Ezeldin & Ghany (2013) identified 31 factors affecting the construction time in the middle-east of Egypt. They concluded that low speed of decision making by employer, lack of construction coordination & supervision, productivity, economic problems, lack of resources, lack of coordination between scheduling.

Ashwini & Rahul (2014) carried out a study on external and internal factors that influence the

construction process and outlines the effect of delay in large construction project. The top ranked factors are delay in land acquisition, delay in equipment erection, inadequate mobilization by the contractor, fund constraints, change in scope of work, cancellation of tender and law & order problem.

Divya & Ramya (2015) studied the causes, effects and minimization of delays in construction projects. The top factors were late approval in confirming the requirements and agreeing the design documents by owner, ineffective planning and scheduling by contractor, change in material types and late procurement of materials, equipment breakdowns, personal conflict among labors and rise in price of materials.

6. RESEARCH METHODOLOGY:

One of the main functions of project management is to forecast and track costs to avoid cost overruns. The concept of cost and time overrun has attracted more attention in recent years. While poor execution of project management tasks can lead to increased costs, we can link less obvious reasons to the processes of project management and the underlying nature of complex projects. Effective project management identifies such possible sources of cost overruns early and mitigates their effect.

The previous studies focused the time and cost separately. This study mainly intends a questionnaire survey relating to construction project cost and time overruns. The questionnaires were prepared by incorporating all the possible factors based on the existing theoretical literature and published paper. This is the novelty of this study.

7. CONCLUSION:

The construction industry is the most important part for the growth of the countries economy, employment and wealth. This paper has examined literature relating to construction project cost and time overruns. From this research study, the overall view of the project members is to control the cost and time overrun of the project. The cost and time of the project can be curtailed by proper planning, scheduling and managing of the project work.

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