



Factors Affecting Cost and Time Overrun In Construction Project

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Abstract. The building sector is India's largest fiscal sector. Timeliness and sticking to set price are two most important factors in overall achievement of project's plans. The primary objective of this study is to pinpoint main reasons why building projects run over budget and behind schedule. To identify factors influencing the increase in construction time and cost, an extensive literature review was managed. Taking these considerations into account, questionnaire was created & distributed to various owners, clients. Following factors have been identified as the most significant causes of construction delays: 'Social relevance effect,' 'Work environment and health and safety in project,' 'Client / owner related polarity,' and sub factors are shortage of materials and labours, and significant cost overrun factors identified are 'Inaccurate project estimations,' 'Serious Project Design Errors,' 'Administration Errors,' 'Not Hiring Right Team,' and sub factors are inflation of materials and equipment.

Key words: construction delays, cost overrun, building industry, client and contractor

Introduction

In today's world, nobody can deny the significance of the building business. The construction of buildings is now recognized as a major global economic force. Because of increased strain placed on construction managers to finish projects on schedule, in under budget, also with excellent & top-quality materials within their stated financial estimate, building projects have become more complicated. The most significant problem facing the building business in emerging nations is persistent issue of expense & schedule overruns. It stands to reason that building industry would exhibit characteristics not seen in other parts of business. For instance, if building industry encounters unexpectedly complex circumstances during design process, additional time and resources will be required. Putting up a large facility takes a lot of effort and money. The pressure on project manager to keep expenses low & deadlines met increases in tandem with project's intricacy.

Importance Of Construction Scheduling

When working on a building project, it can be helpful to keep track of when specific chores

are due and what materials will be required. Its primary function is to map out order and duration of various building tasks. When finished, it provides a comprehensive overview of project's lifecycle by pinpointing starting and ending points of individual activities and compiling the results.

Each task's resource needs are calculated based on evaluation of activity progression. The timetable for a normal building job is developed primarily by a dispatcher. The beginning & ending times of a task are established based on its expected length of time, its dependency connections with other tasks, the availability of resources, & completion date of the project.

Cost Overruns In Projects

The budget is most crucial part of any building endeavours. Cost overruns, however, are a prevalent issue in building projects across globe, and more study is required to find ways to prevent them in future. This trend is even more pronounced in emerging nations, where costs often end up being double or triple their initial estimates. An overflow in the budget, as well characterized as cost overrun, occurs when a project's total

expenses exceed its original budget by more money than was originally anticipated. This can lead to project delays or even failure. In both established and emerging nations, rising prices have become a major problem. This is a crucial area to investigate for potential mitigation of the issue.

Factors Affecting Cost Overrun

1. Inaccurate project estimates.
2. Inaccurate Project Designing Faults.
3. Administration Errors.
4. Not Hiring the Right Team.
5. Poor Site Management

Inaccurate project estimates:

Your project will fail from the start if you start with a wrong timeline and budget. The intensity of competition during tendering process can lead to exaggerated assumptions about scope of task to be done. Some initiatives will have universally high projections because they were developed using a formula. Estimation of a project may start before the RFQ is even issued. All parties involved in endeavor can voice their worries about cost & schedule at this point.

Inaccurate Project Designing Faults:

Cost overruns in construction projects are unavoidable if your design plans are flawed. A flaw in design is a poor design, an incorrect or incomplete plan. Design flaws are so common and a source of frustration for both owners and designers that a study conducted by Engineers Daily estimated that design errors are responsible for 38% of construction disputes.

Administration Errors:

In the building industry, cost overruns seem to be inevitable if the initial design plans were faulty. A design defect is an imperfect or inaccurate blueprint for something. A survey by Engineers Daily found designing mistakes account for 38% of all building conflicts, which is major source of irritation for both proprietors & planners.

Not Hiring the Right Team:

Assuming that scope changes are being handled properly & project planning are perfect. The other reason for cost overruns is a subpar performance from team carrying out work. The best-laid designs and plans are no match for incompetent Sub-contractors, who can cause significant delays, extra costs, and other problems. As unfortunate as it may be, many general builders don't put enough thought into qualifications of their

freelancers when constructing team for a given project.

Poor Site Management:

There are many aspects to look after likewise, Material Price Fluctuation, Equipment Management, Quality Control, Insufficient technical support from head office and many more. The changes in these factors directly affect the cost overruns which again creates many problems; due to these personalities clash between owners and contractor happens. Material price fluctuation has been seen both in progressed and progressing countries.

Time overruns in Projects:

Among most prevalent, significant, and crucial problems with building initiatives is time element in civil engineering. Overloading project managers' schedules remains a major challenge despite progress in technology and knowledge of project management. There are many potential causes of project delays. Material supply delays, machinery failures, governmental issues, & inclement weather are just a few examples of many causes of construction delays. Sometimes delays make things worse. Identifying the causes of delays and, depending on the project's length, A thorough evaluation requires selecting the right and accurate measures to minimize the negative effects of delay.

Factors Affecting Time Overrun

1. Social relevance effect
2. Work environment and health and safety in project
3. Client /owner related polarity

Social relevance effect:

When planning a project, most schedulers are unaware of the impact of social constraints. The major issue in the Indian construction industry, whether public or private, is socially relevant issues in the project. Social conflicts impede the steady progress of work, resulting in schedule overruns. Changes in municipal or government rules regarding the project's location, improper collaboration of citizens and political parties, claims of adjacent or adjoining building occupants, and bringing legal cases against the builders owing to noise and pollution disturbance. As a result, there may be a problem with the social initiative. Etc.

Work environment and health and safety in project:

Workplace & health and safety issues can take place infrequently throughout project. However, impact of working environment or environmental and safety issues causes a significant loss in project scheduling. This can cause the project to be delayed for several weeks or sometimes even months. The scheduler may not evaluate or give scheduling to address such a situation, or may not provide a scheduling time buffer. Primary motivation for such planning is to ensure that project's proprietor or customer is happy with project's potential for profit. Natural disasters, poor weather conditions on the project's site, geography, and topography can all cause environmental issues. Accidents, worker health difficulties, and project working conditions may all be factors in health safety.

Client /owner related polarity:

Time overruns are caused by client/owner difficulties, which occur when they fail to give project information to impact makers. Inflation induced by time overruns caused by owners or customers, such as payment delays, decision delays, and site handover delays, raw material supply delays, and occasionally time and cost owing to faulty planning and spoiling may be increase. Stakeholder communication is essential.

Review Of Literature

Determine impacts contributing towards cost overruns in Jordan's public building industry. Following a review of the literature, he identified the following characteristics that influence overruns: Material price inflation, Fuel cost inflation, Design revisions, Incorrect inventory count, Due to inexperience with project sites, Inexperience with this sort of effort, Absence of expertise in local laws, unusual weather circumstances, and Tools shortage. Thirty engineers who work in Jordan's public building sector gave their opinions on the causes of cost overruns, & PCFA analysis was used to order these causes. The results showed that design modifications, a dearth of expertise with project type, as well as project's location were identified as most significant. (Ghaleb J. Sweis, Rateb Sweis, 2013) [5] After conducting research into what causes delays and budget overruns on Indian building projects, a questionnaire was crafted and sent out to construction professionals in India. Utilising relative importance index, they determined that material market rates,

contract adjustments, & high-quality work requirements were the most significant contributors to schedule delays, while increased shipping costs, changes in material specification, and material price increases were most significant contributors to budget overruns. (S. Shanmugapriya, Dr. K. Subramanian, 2013) [9]

Researchers conducted a detailed poll in one particular emerging country, Turkey, and analyzed data utilizing Relative Importance index technique. They found a wide range of factors that could account for such cost overruns. Poor project estimate costs, poor planning, & higher cost of resources required, a shortage of experienced staff, rising prices for building materials, and rising prices for land are primary reasons for cost increases in residential project development in Turkey, as determined by a factor analysis. (Syuhaida Ismail and Nooh Abu Bakar, 2012) [10] Numerous aspects were examined using various ways. Questionnaire based on past research.

Upon further investigation, they found that issues with weather forecasting and timing, a lack of on-site administration, varying material costs, inadequate tracking and inefficient resource management, & inefficient finance monitoring of project as well as site could all lead to price overruns. (U. Sindhu Vaardini, S. Karthiyayini, 2016) [11] analysed the literature and administered a questionnaire survey to determine the reasons and the consequences of construction project delays are local Political meddling. Prolonged delays in customer payments, sloppy project timing, inadequate budgeting, and rising costs of raw materials all contributed factors. The RII was utilized for evaluation & ranking purposes. He, too, used Spearman's rank correlation coefficient test and identify key relationships between contractors and the advisory approach. (Hatkar K B & Hedao N A, 2016) [6]

Loss of a project has been linked to late deliveries of required supplies to provider or late payments of bank account bills. These issues, in addition to others, like delays in getting permits & other issues listed above, make it harder to complete the job on time and on budget. Low resource efficiency, especially machinery output, is another problem that building industry must address. (Prof. Ashish P. Waghmare, 2015) [8]

Major 5 aspects impacting cost escalation in construction were identified as economic insecurity, political instability, material price variations, competitive levels, and currency exchange. (Anant Narayan Shete, Vaibhav Durvas Kothawade, 2016) [2]

The research found that "delay in the original distribution of the site" had been single most significant contributor to budget overruns. Components and tools supplied by provider are late arriving, driving up costs. It was found that "low labor productivity, postponement in paying bills, absence of apparatus upkeep, poor purchase of materials, poor planning, protests, rallies, and other exterior problems" comprised most influential factors in project delays. (Vaibhav Y. Katre¹, Dr. D.M. Ghaitidak, 2016) [12] Poor site supervision and management, ineffectual time management, and a delay in condoning extra tasks, as well as bad weather and sloppy planning as well as timing by contractors, unskilled technical staff, a surplus of work for contractors, a shortage of available workers, and a lack of available funds all contributed to project's delay. (Aishwarya Prashant Patil, 2017) [1]

There were 59 similar variables found after a questionnaire poll and conversations with chosen seasoned employees in Malaysia were performed and their responses were assessed using average index technique. Poor planning, design delays, impractical contract length and standards, lack of expertise, insufficient planning and errors during building etc., were cited among most frequent and important factors by experts. (Ismail Abdul Rahman, Ade Asmi Abdul Azis, 2011) [7]

Investigates the issues that are causing construction delays in India. The authors identified key factors influencing construction delays in India and developed a prediction model to calculate the effects of those factors on delays. Using factor assessment and regression modelling, factor positions were calculated over time. (A., Iyer, K.C., and Rentala, S., 2012) [4] Schedule and expense overruns on projects in India's Pune region were analyzed by contrasting original estimates with the final numbers. As per data, the following are most common causes of timetable and budget overruns on domestic building projects: delays in decision making; inaccurate time assessment of project duties and responsibilities; unforeseen situations;

internal disputes in within project team; poor work organization & planning; inaccurate cost estimates; and changes in scope, design, and plans. (Bhatia. and Apte, M.R, 2016) [3]

Methodology Review

This project's research topic is Factors Impacting Cost & Time Overrun in Construction Project Scheduling. Initially, twelve pieces of literature were collected and thoroughly examined. Project completed based on knowledge gained from literature.

An initial cost estimate can be established based on the construction project timeline. It offers a series of functions. Thus, project manager is aware of tasks that must be completed & measures that must be taken in order to move forward. To determine whether construction is progressing satisfactorily, compare the actual work done with the schedule.

Projects rarely go as planned, as all project managers know. Nonetheless, it is best practice to do everything possible to keep project costs under control. Without an outline, you risk incurring unexpected costs and will have no way to track the project's actual spending. Followings are the factors affecting cost overrun Imprecise project estimations, Serious Project Designing Errors, Management Errors & Not Hiring Right Team.

A project has experienced delay when it takes longer than expected to complete the work. Followings are the factors affecting cost overrun social relevance effect, Work environment and health and safety in project and Client /owner related polarity.

Conclusion

The preceding discussion reveals that many overruns, quality control, poor site management, and other things are suffering as a result of material price fluctuations, which may result in contractor losses. These issues, as well as others such as administrative errors.

Poor planning, expense overruns, personnel neglect, mistakes made by the project designer, delays in decision-making, lack of proactive action on the part of any of the parties involved, equipment, and quality control are all factors. Each of these organizations has a variety of justifications for why building projects are delayed. This suggests that these variables require immediate action. Since the majority of the

causes are widely understood and manageable with the right planning.

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