

What Holds Construction Projects Behind Schedule

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Abstract: The project management team faces a difficult challenge when they must complete a building project on time. One of the biggest problems in the construction sector is time overruns. It is the process of extending the duration of a building project beyond its originally planned end date. Finding, evaluating, and prioritizing the many variables impacting time overruns is the goal of this research article. In order to determine the possible causes of construction project delays, a comprehensive literature research was carried out. Contractor, client, consultant, labor, and external variables were the five main groups into which the elements were categorized. Forty construction businesses were sent a survey questionnaire based on 35 criteria found in the literature research. Using SPSS's reliability test, we made sure the survey results were legitimate. The most important elements influencing time overruns were determined by statistical analysis of the data using the relative important index approach. The time overrun factors were ranked based on the findings of the questionnaire survey. Local market material shortages, delays in getting work licenses from authorities, material price increases, poor delivery of construction supplies, and payment delays were determined to be the most important factors contributing to construction time overruns. In order to identify the possible reasons of schedule overruns, a case study was carried out on an apartment building project. Similar variables might be summarized by comparing the results of the questionnaire survey and the case study.

Keywords: Reasons for Delays, Time overrun, relative importance index, questionnaire survey, construction project

1. Introduction

One of the most difficult tasks facing project managers is ensuring that construction projects are finished on time. When it comes to building projects, time overruns are among the biggest issues. When unforeseen circumstances cause a project or its completion to be delayed or postponed, this is known as a time overrun in the construction industry. When a project takes longer than expected to complete, whether because of unforeseen circumstances or because the parties involved originally agreed upon a different deadline, this is known as a delay. Disputes and significant risks may arise from construction time overruns. Consequently, in order to accomplish the project goals and avoid the many risks associated with time overruns, disputes, arbitration, complete abandonment, and litigation, it is crucial to grasp and comprehend the causes of these issues. Multiple time overruns may happen at once, and they can all affect when a project is expected to be finished. Project completion on schedule is a measure of efficiency, but there are a lot of unknowns that might arise from a variety of sources throughout construction. Among these factors are the following: contractual relations, environmental circumstances, financial availability, resource constraints, and the performance of the many construction partners. Better scheduling and planning of a construction project, as well as improved project performance, may be achieved by analyzing the frequency of time overruns, the potential severity of time overruns, and the factors impacting time overruns.

2. Objective of the Study

The main objectives of this study include the following:

- To identify the most critical factors influencing time overruns in construction projects and to evaluate their relative importance
- To statistically analyze and rank the factors affecting time overrun from the questionnaire data
- To investigate the expected effects of these factors on the time overruns of a selected sample of the construction projects in nearby area.

3. Research Methodology

To find out what causes construction projects to go over budget, this study used a questionnaire survey as its research approach. In order to determine the causes of construction project delays, we combed through publications, conference proceedings, and interviews with professionals from every stakeholder group. The



survey's questionnaire was categorized into five main areas based on 35 causes of schedule overruns. Examples include things like external variables, factors pertaining to labor, clients, consultants, and tractors. Respondents were asked to use a five-point Likert scale to score each factor. Following is a breakdown of the possible responses: 1 for very disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree. A field research was conducted to get input from experienced individuals in the construction business on the criteria found via literature studies. This feedback was then used to formulate the questionnaire.

3.1 Respondent's profile

The questionnaires were distributed to project managers, site engineers and contractors of various construction projects. The characteristics of the respondents participated in the questionnaire survey are summarized in below. Table 1 indicates that majority of the respondents are working with contractors organizations followed by client and consultant

Table 1: Respondents Demographics

Consultant	9	22.5
Total	40	100
Designation of Respondents		
project manager	24	60
site engineer	10	25
contractor	6	15
Total	40	100

Respondents Work Experience		
Experience in years	Number of respondents	percentage
0-5 yrs	7	17
6-10 yrs	10	25
11-15yrs	15	38
>15 yrs	8	20
Total	40	100
Type of organization		
Contractor	18	45
Client	13	32.5

Weather effect on construction activities	.73	9	External
Late supply of information and late decision making	.715	10	Client

1.1 Reliability analysis

Reliability test is conducted in SPSS v 21 to check the stability and consistency of a data. Here to test the reliability of the collected data, Cronbach's alpha method was used. If Cronbach alpha is <0.6, the data is not reliable and cannot be adopted and if it is >0.6, reliability is very high. The result of reliability test as shown in Table 2. Alpha value of all category factors greater than 0.6, which concluded that this research instrument is good and reliable.

Table 2: Reliability Test for Time Overruns Factors

Sl no	Factors	Cronbach's alpha
1	Contractor related	0.862
2	Client related	0.802
3	Consultant related	0.857
4	Labour related	0.663
5	External factors	0.646
6	Overall Cronbach alpha value	0.913



1.2 Relative Importance Index (RII)

The questionnaires were analysed using Relative importance index method. The ranking of factors was calculated based on the corresponding RII value.

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

RII = Relative Important Index A = Highest weight

N = Total number of response

1.3 Ranking of factors of Time overruns

Hierarchal assessment of factors was carried out to determine ranking of the factors based on level of significance. It was assessed based on Relative important index (RII) value shown in Table 3. It shows that top 5 most significant factors of time overruns ranked by overall respondents are Shortage of materials in the local market, delay in obtaining work permits from authorities, rises in the price of material, poor delivery of construction materials and delay in payments etc

Table 3: Ranking of Top Ten Delay Factors

Table shows the RII of factors contributing to time overruns of construction projects. the result obtained shows that the most 10 significant factors influencing time overrun of construction project include Shortage of materials in the local market with RII (0.89), Delay in obtaining work permits from authorities(0.885), Rises in the price of material(0.8), Poor delivery of construction materials(0.79), Delay in payments(0.78), Shortage of labour(0.77), Delay in inspection and testing of completed works(0.765), Delay in providing services from utilities (water, electricity etc.)(0.745), Weather effect on construction activities (0.73), Late supply of information and late decision making (0.715) etc.

1.4 Case study

Time overrun is frequently experienced by most of the construction projects. This section shows the time overrun and factors causing time overrun in an apartment construction project in the locality. This is a 17 floor building contains 66 flat. The project duration was estimated to be 778 days by considering almost all activities. The selected construction project was not completed within estimated duration which was specified by planning and experienced time overrun. Various works carried out at the site were studied by visiting the construction site. The delay in each work beyond the estimated schedule and the factors causing the delay were understood from the information collected from the project manager. Shortage of materials had the most considerable effect on the project which affected six activities and caused delay in project duration, followed by late delivery of materials to site or poor procurement of construction materials that affected five activities. After these factors, delay in payment, Delay in inspection and testing of completed works, Late supply of information and late decision making etc were affecting two activities. Poor planning and scheduling, rises in the price of the material were also affect some activities. Inaccurate estimation of work duration and late delivery of previous activities were the other factors mentioned by the construction parties.

2. Conclusion



Time overruns can be minimized only when their causes are identified. Knowing the cause of any particular delay in a construction project would help avoiding the same. This re- search work was therefore, aimed at identifying the major causes of time overruns in construction projects .By compar- ing the results of case study and questionnaire survey, similar important factors could be summarized. It could be mentioned that results of the case study confirm the most important fac- tors considered by respondents in questionnaire survey. Ac- cording to the results most important factors were material shortage, delay in material delivery to site or poor delivery of construction material, delay in payment, rises in the price of the materials, poor planning and scheduling, delay in inspec- tion and testing of completed works etc. These factors should be controlled and reduced before and during the construction project procedure to achieve completion of the project within scheduled time and avoid or minimize time overrun in project

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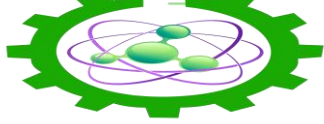
<i>Factors affecting time overrun</i>	<i>RII</i>	<i>Rank</i>	<i>Factor group</i>
Shortage of materials in the local market	.89	1	External
Delay in obtaining work permits from authorities	.885	2	External
Rises in the price of materials	.8	3	External
Poor delivery of construction materials	.79	4	Contractor
Delay in payments	.78	5	Client
Shortage of labour	.77	6	Labour
Delay in inspection and test- ing of completed works	.765	7	Consultant
Delay in providing services from utilities	.745	8	External

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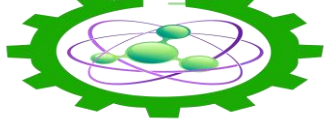
is frequently experienced by most of the projects. This section shows the time factors causing time overrun in an apartment project in the locality. This is a 17 floor contains 66 flat. The project duration was be 778 days by considering almost all selected construction project was not within estimated duration which was planning and experienced time overrun.

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and have effective construction time planning.

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