

# **A Strategic Implementation of Evaluation of Influential Elements in Scheduling for Construction Projects**

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**Abstract:** - Many initiatives in the construction business are fraught with uncertainty and risk. The primary aims of project management are to finish the project within the estimated time frame, at a reasonable cost, and with the desired quality. However, in reality, a range of qualities and limits are involved from time to time, which must be successfully managed by overcoming numerous hurdles. The completion of a construction project involves multiple aspects, and various features contribute to the level of their impact on the project. Apart from studying literature and conducting a pilot study, these factors were found through talks with experts and practicing engineers. For the experiment, a questionnaire was created and administered to a group of construction experts of varied capacities. The responses provided were factored. A statistical model was built using the data. The model was examined with SPSS, and the results included frequency, mean variations and deviations, and other statistical metrics. For quantitative interpretation of the results, the variations mean and deviations were evaluated and depicted in the bar chart and pie chart. According to the findings of the investigation, project resource management and supportive management play a critical part in the project's successful completion. According to the investigation, elements such as technical skill, financial management, and managerial efficiency were determined to be dominating at the next level. However, the concerns pertaining to social, environmental, and safety were given the least weight the receivers. The number of respondents in this study is restricted, however a larger experiment with a greater number of respondents was conducted to obtain a more accurate result. This article discussed and elaborated on the extensive analysis, interpretations, and summary of the findings.

**Index Terms:** - Construction Scheduling.

## **I.INTRODUCTION**

Development project arranging and execution includes which is intricacy of undertakings interesting and well defined for the idea of the task. The capability of arranging and booking includes a ton of mastery and involvement with making the fruitful execution of the task. In any case, the different sorts of traits and variables connected with the undertaking, for example, assets, development, funds must be painstakingly considered for their possible effect on the culmination, which are to be accounted in the making of the timetable.

As a general rule, however various suppositions were made during the preparation and planning they were changed and altered during the execution times. These were to be accounted and the progressions must be overseen suitably with the least varieties and their possible effect will be limited.

Nonetheless, there was restricted data of measured information accessible for the organizer, making the undertaking booking complex. Thus the presumptions made were to be precise or, in all likelihood it were lead to mistaken and improper timetable which makes the venture fruitless. An enormous number of bombed projects were of this class showing the absence of information.

A knowledge into the execution of tasks and booking their arranging strategies had uncovered and that countless traits and elements were contributing with their changing effects for the fruitful finishing. These were subjective naturally frequently used by the organizer for their booking.

A work has been made to comprehend these variables by recognizing their tendency and attempting to evaluate their logical effect on the venture by including master meetings and distinguishing the underlying driver.

## II. SCHEDULING CONCEPTS

In the act of the development business arranging and booking is a critical errand to be performed by the accomplished organizers. Be that as it may, the booking is for the most part done either founded on time or cost and as needs be named to be cost arranged timetable and time situated plan contingent upon the sort of venture. More often than not, the assets and their accessibility assume a crucial part and consequently cost situated booking is generally broadly utilized and when conditions justified for the consummation of the undertaking inside the time, then movements of every kind are back attempted to meet the finishing time. Appropriately the assets are designated, evened out and advanced for the best use of assets as well as task time span.

Nonetheless, practically speaking the planning is a perplexing undertaking including differing credits and the evaluation of their effect on the task. The general ascribes that are significantly affecting the venture are gathered and given in Figure 1.

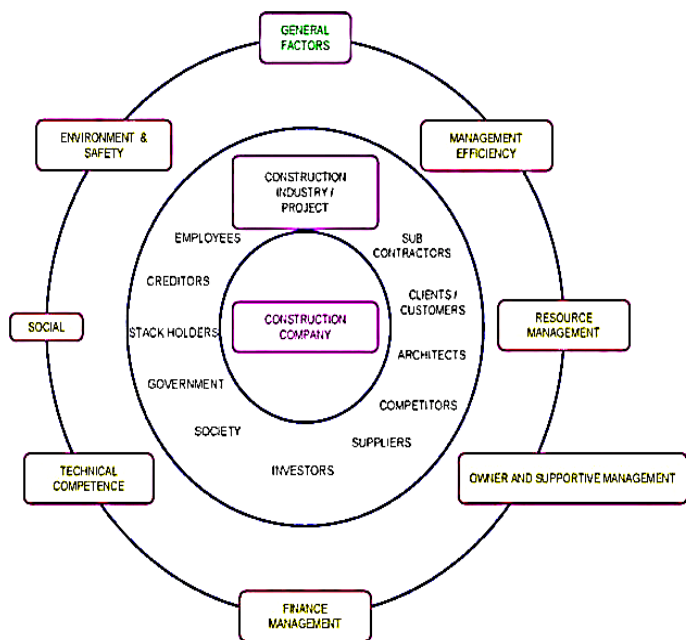


Fig 1: Typical Complexity Involved In a Construction Project.

### General Patterns affecting construction

Figure 2 depicts the various characteristics of the construction as they are generally organized, including social and environmental aspects, safety and environmental concerns, technical proficiency, supporting management, management effectiveness, financial management, and resource management.

After the project is finished, the user will either be generally public or private. The society includes both project participants and users. The

completion of the project depends heavily on societal support. The general public may oppose, protest, and hinder the construction process by preventing the movement of workers, supplies, and equipment as well as obtaining necessary permits. Land purchase and their cooperation are crucial in the case of public initiatives. This research examines and accounts for the construction project's level of contribution and relevance.

The most important necessity for any construction project is safety. There are several standards, and their strict application ensures safety. When safety is compromised, the project's duration and overall progress are both negatively impacted. But due to financial constraints and other factors, these were typically assigned the least importance. To find out why, a poll was conducted, and the results are explained.

Environmental approvals are now required for the bigger project. Additionally, the topography affects how well construction-related equipment and supplies move. Black top roads, rivers, waterways, and power all play a significant role in how the project can be built.

Because the project is a team effort, everyone's cooperation is absolutely necessary. The owner's contribution and his backing are what make the completion possible. The project will advance toward its completion goals with the help of an effective project management team and their desire to work hard.

The technical team is responsible for handling construction projects with complicated technological requirements. The effectiveness of the engineers and technical team tackling these problems will determine how quickly they may be resolved. The poll is looking at and determining how much weight is normally given to these criteria. In this paper, the findings are covered in detail and debated.

The project management team is what makes the project get done. modern tactics, effectiveness of management, and use of most recent technologies and procedures. The success of the project and finishing on time are important elements. However, in actuality, management effectiveness is very important for project completion.

The project's financing is intricate and crucial. The main element in preventing project overruns is effective money management. To prevent project cost overruns, a disciplined strategy must be used in the control of the budget and cost of activities. Here, it is examined and reported on how well this is being handled and to what degree

these are aiding in the schedule's successful implementation.

Materials, equipment, labor, and personnel must all be scheduled and utilised properly during the construction process. With an efficient resource management program, an optimum utilization of resources will result in a decrease in project costs. Without effective resource management or a poor plan, the project will fall short of its goals and present a number of problems, including cost inflation, labor and material waste, and idle times for machines.

## ASSESSMENT OF IMPACT OF AFFECTING SCHEDULE

The demographic and questionnaire portions of the survey are conducted separately. The statistical

Table 1: Demographic Information model is being created and examined using SPSS.

Designation	Percentage
Construction Manager	9.5
Project Manager	21.0
Project Engineer	15.0
Planning Engineer	27.5
Site Engineer	32.0
Organization type	
Sole Proprietor	5.7
Partnership	1.9
Private Limited	81.4
Public Limited	9.5
Others	1.4
Project type	
Residential	19.5
Commercial	44.8
Industrial	11.9
Infrastructure	21
Others	2.9
Type of scheduling	
Resource	21.4
Time	67.1
Line of Balance	11
Others	0.5

Since examining every single element individually can take a lot of time and be a difficult process, the factors are recognized, aggregated, and taken

into account for each category. A number of characteristics relating to the social, environmental, and safety issues were combined and categorised. Finance management is the name given to the group of elements that affect finances. Similar to how categories were generated, these groups were also employed for the analysis.

### Factor Rating

The factor rating approach employs a 1–5 point Likert scale. This form of likert scale is frequently employed in market research and is a type of psychometric response for surveying. The respondents are permitted to answer to the questionnaire survey using the Likert scale approach. The likert scale was employed in this study to gauge participants' opinions regarding the project's timeline overrun.

### Demographical Analysis and Results

Construction professionals working on different projects were given the semi-structured questionnaire, and their replies regarding the current project were gathered. The information was gathered using a variety of methods, including face-to-face interviews, postal surveys, and friends-of-friends questionnaires.

Part A and Part B of the questionnaire were divided into two separate sections. The first Part A contains the respondents' personal information as well as project features including designation, kind of organization, type of project, style of scheduling, etc. The second Part B contains 53 variables that affect the scheduling of construction projects. Later, the Part B was divided into seven distinct groups.

The survey method is helpful for gathering a wide variety of data and a sizable participant pool to refer to any type of research problem. The questionnaire was created using the pilot study's expert opinions and a literature review. A semi-structured form was used in the questionnaire's construction, allowing participants to freely express their opinions. Only 200 of the 270 projects that the study's questionnaire was sent to and successfully got 200 responses that were fully completed. The proportion of 82% of respondents completed the questionnaire, which is a respectable number for moving forward with the analysis.

Data were gathered from a variety of construction experts, including project managers, project engineers, and site engineers, etc., via in-person interviews and mail when in-person interviews

Table 1: Demographic Informations

were not possible. Descriptive statistics were used to learn more about the respondents' specifics.

Designation and other project criteria were examined and reported based on table 1.

When respondents' profiles are taken into account, site engineers contributed the most (32%), planning engineers came in second (27%), and project managers came in third (21%). Table 1 also reveals that private limited companies contributed the most to company profiles (81.4%), indicating that only private limited companies received the majority of responses.

The replies to the project, which covered key cities in southern India, were divided into five categories: residential, commercial, industrial, projects related

to infrastructure and others are included in Table 1. It is discovered that the samples gathered are a well-balanced mix of all different types of projects, demonstrating the consistency in the research's findings.

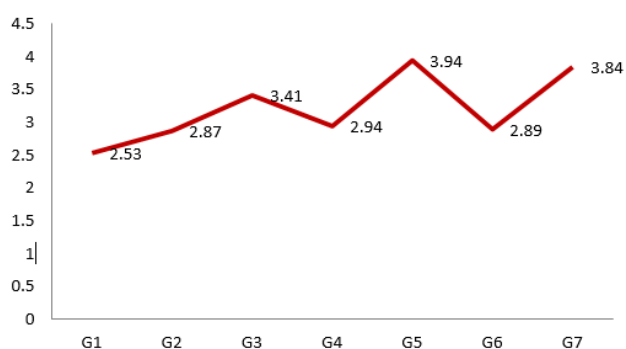
The time-based approach contributed the most to project scheduling, at 67.1%, followed by the resource-based approach at 21.4%.

Sl. No.	Factor influencing construction project schedule	Mean	Std. Deviation	Mode
1.	Whether local / social hurdles affect the schedule of project?	2.42	1.096	3
2.	Whether local people co-operate for the work progress?	2.70	1.021	3
3.	Whether work was affecting local / government policies?	2.24	1.077	1
4.	Whether project was affected by change of Government?	2.09	1.116	1
5.	Is there any local disturbance by the political members?	2.18	1.168	1
6.	How far the project was affected due to any payment of stakeholders?	2.48	1.207	3
7.	Whether the project was to complete the target based on payment systems by contract?	2.90	1.124	4
8.	Whether the schedule is being affected due to lack of finance?	2.61	1.286	3
9.	How far the project has a sufficient technical support by the workers/engineer in the project?	<b>3.72</b>	0.955	3
10.	Whether you classify the project in the technical aspects at the time of scheduling	3.55	0.988	3
11.	Do you have a separate consultant team for the technical support?	3.17	1.337	3
12.	How far the project was inspected at the time of major activities?	<b>3.80</b>	0.964	2
13.	How far the planned resources can be obtained at the time of work?	<b>3.57</b>	0.937	4
14.	How far the project has faced problems by the neighborhood issues?	2.56	1.039	3
15.	How far the planning of housekeeping was implemented in your project?	3.54	1.072	4
16.	Whether any specific Measurement is followed to maintain good environment?	3.52	1.081	4
17.	How far their project is run by hierarchical process?	3.38	1.011	4
18.	Whether the designation / category is followed based on experience or education system of employee?	<b>3.70</b>	0.987	4
19.	How far the project faced internal dissatisfaction among the workers?	2.54	1.076	4
20.	How far the project is using advanced technological methods?	3.46	0.934	3
21.	How far the project follows resources documentation systems?	<b>3.60</b>	0.908	4
22.	How far the project identifies the waste of resources?	2.94	1.061	3
23.	How far is the co-operation among the stakeholder in the project?	3.10	1.066	2
24.	Whether the project scheduling was developed based on earlier project parameter/ information?	3.23	0.951	4
25.	Whether the project has faced unavailability of materials?	2.49	1.090	3
26.	Whether the project is affected due to increase in materials prices?	2.74	1.099	4
27.	Whether the project was centralized procurement system?	3.22	1.206	2
28.	Whether the project has sufficient vendors?	3.49	1.082	3
29.	Are there any shortage of materials, labour and Machinery as planned in the schedule?	2.64	1.112	3
30.	Whether the project was affected due to interrelationship with the craft / crew?	2.33	1.059	4
31.	Whether the project was rectified based on review system?	3.03	0.980	4
32.	How far the project is being affected by contractors or sub-contractors?	2.70	1.071	4
33.	How far decision will be taken if any issues occur on the project?	3.37	0.970	2
34.	How far the client interference with in making changes in the project?	3.37	1.109	3
35.	How far the recruitment and evaluating the status of contractors and sub-Contractor in the project?	3.27	0.992	4
36.	How adequate the project is implementing new methods and technology?	3.26	1.013	2
37.	How adequate is training and knowledge sharing about new method & New technology to the	3.45	1.007	3

G.N O.	TYPE OF FACTOR	MEAN	RANKING
G1.	SOCIO PROJECT CONTRIBUTION	2.53	5
G2.	ENVIRONMENTAL AND SAFETY	2.87	6
G3.	SUPPORTIVE ROLE OF OWNER AND MANAGEMENT	3.41	7
G4.	TECHNICAL COMPETENCE OF THE PROJECT	2.94	3
G5.	MANAGEMENT EFFICIENCY	3.94	1
G6.	FINANCIAL MANAGEMENT CAPABILITY	2.89	4
G7.	RESOURCE MANAGEMENT	3.84	2

Table 2: Ranking of Influencing Factor

In Table 2, the factors are listed in order of the mean value. The top 5 criteria with a high mean value are the provision of correct designation based on education (3.70), the inspection of important operations at the time of execution (3.80), technical support provided by engineers and workers (3.72), communication among the stakeholders (3.72), and resource documentation (3.6). But when it comes to mode value, the engineers' top priorities are the provisions for suitable classification based on education (4) and recourse documentation.



Graph 1 L Ranking Pie Graph

(4) and projected resources acquired at the time of the project could affect the project's timeline. Based on survey questions regarding the factors influencing the scheduling of construction projects, the 53 critical factors were subsequently divided into seven groups, including socio-project contribution, environmental and safety, supportive role of owner and management, technical

competence of the project, management efficiency, financial management capability, and resource management.

### III. CONCLUSION

In India plan based development project the board is as yet another idea in and another word in the Indian development industry. It is normal that the pattern will be changed quickly. This study incorporates the recognizable proof of basic variables and the basic gathering in development booking. A poll study containing 53 recognized basic elements was led with field specialists. 210 reactions were gathered from experts utilized at different ventures. The main 5 elements among 53 variables were recognized by positioning the elements in light of the mean worth of the respondents. The main variable was absence of Investigation of significant exercises at the hour of execution with most elevated mean worth of 3.80. Nonetheless, the mode esteem recommends that the various conclusions for booking issue, In arrangement on appropriate assignment in light of schooling or accountable for concerned exercises are not able to deal with the venture and they are selected by the greater part of reactions as high worth 4.

Later the 53 variables were synchronized as seven gatherings to zero in on settling the issue on planning. The highest gatherings were recognized in light of mean worth in administration effectiveness (3.94).

This study will help the undertaking arranging and booking group to distinguish the exercises which have shifting effects of various gatherings of variables that are administering the fruitful planning and execution of the tasks. The quantitative development of the effect on the elements assists the administration with taking the best choice in development projects. These discoveries shows the various parts of advantages and disadvantages in the undertaking a positive outcome among the partners to take the best choice. Advancement is much significant for carrying out to quantify the adequacy of the venture. The information gathered was exposed to 5-scale Effect of the elements with Scores. Those scores were utilized to actually take a look at the booking in the apparent effect of the related variables.

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