IDENTIFICATION OF OPTIMIZING FACTORS FOR PROJECT CONTROLS

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Abstract

Delays and cost overruns remain a persistent challenge in the construction industry, particularly in developing countries where inadequate planning and resource management amplify risks. This study investigates the key factors contributing to delays and reduced productivity by conducting a structured questionnaire survey, project-based productivity assessment, and delay analysis on commercial projects. The survey results identified critical issues, including unskilled labor, warehouse mismanagement, poor coordination among subcontractors, unclear responsibilities, and design-related deficiencies. Productivity analysis revealed significant discrepancies between planned and actual outputs, largely driven by inefficient warehouse operations, poor site management, and a lack of skilled manpower. A comparative as-planned versus as-built schedule highlighted a cumulative delay of 93 days, underscoring the role of subcontractor mismanagement, labor shortages, and material delivery problems. The findings emphasize the necessity of strengthening supply chain management, enhancing labor competency, and awarding subcontracted work based on proven past performance. This study contributes to the ongoing discourse on construction management by providing practical insights and actionable recommendations for minimizing delays and improving efficiency in complex construction projects.

Keywords
Construction Industry, Productivity, Delays, Cost Overruns, Construction Schedule

1. Introduction

Construction tasks are inherently complicated by nature due to the number of stakeholders and complex tasks, interrelated activities, and a huge amount of investment. Notwithstanding improvements in project management techniques, time and cost overruns are still common, which erode the performance and profit of contractors. In low-income countries, the situation is exacerbated by a poor institutional environment, inadequate planning and management of resources, lack of skilled human resources. Delays in construction projects cause not only cost overrun but also erode the faith of stakeholders and delay the provision of vital infrastructure.

In construction projects, delays are frequently the consequence of poor management and can be considered a risk that might be controlled, reduced, and mitigated if they were recognized, examined, and handled methodically across the project life cycle (Umar, 2018). Delays and other productivity and efficiency losses continue to plague the construction industry. Project abandonment, litigation, and time and expense overruns are some consequences of delays (Sanni-Anibire et al., 2022). Key stakeholders suffer when construction projects are delayed because of the rise in unfavorable relationships, claims, litigation, arbitration, and cash flow issues (Enshassi et al., 2009). Until a construction project meets the time, cost, and quality constraints imposed on it, it can be considered a success. Nonetheless, it is not unusual to witness a construction project fall short of its objective within the specified budget, schedule, and quality. The field of "project management" is used to address the unanticipated delays in advance, which reduces the delays (Altarawneh et al., 2018). The degree of cost overruns and timetable delays in the construction industry depends on a number of factors. These risk variables may be divided into those relevant to the contractor, consultant, design criteria, information, and conditions in the market (Melaku Belay et al., 2021). Cost overruns in construction projects are defined as the difference between the actual project completion cost and the contract budget amount (Kesavan et al., 2015). Every other project in this industry suffers cost overruns (Ashrafi et al., 2022). The cost overrun is calculated by adding the initial anticipated cost to the total completion cost incurred during project commissioning. The difference between estimated and completion costs is known as the size of the cost overrun. One of the crucial elements for any construction project's success is cost overruns (Ashrafi et al., 2025). Cost overruns occur when the completion cost of a construction project exceeds the contract amount agreed upon by the parties during the project's start (Ainul et al., 2019).

Construction delays are a frequent occurrence that typically has negative effects. These delays mostly relate to circumstances that result in the construction project's completion taking longer than scheduled (Alajmani et al., 2024). It is the amount of time that passes after the delivery date that the various parties to the project have agreed upon (Elhusseiny et al., 2021). Additionally, delays result in a variety of project modifications, including delayed completion, higher expenses, and even contract termination (Arditi & Pattanakitchamroon, 2006). Completion of a project within schedule is one of the most crucial success factors for a construction project (Durdyev & Hosseini, 2020). Lower bids, political involvement, and bad communication sometimes become causes of delays in construction projects (Islam & Suhariadi, 2018). Delay is the leading cause of dispute, and a proactive and fast solution is critical for economic success. However, the majority of construction tasks fail to resolve time-related problems (Koc & Işık, 2020)

To analyze this challenge, the study offers an analysis of both the perception-based and project-based data. A survey was carried out to determine the key contributing factors to delays and productivity loss by taking the responses of key professionals in the construction industry. In line with this, productivity data were gathered from a commercial construction project based on activities. Lastly, the delay analysis of the same project was conducted by comparing the as-planned schedule and the as-built schedule. The comparison of these three approaches will give the study a wider perspective of the root causes of delays and low productivity.

2. Methodology

2.1 Literature

In order to fulfil the objectives of this study, the first step is to identify the common factors for delays with the help of a literature review, from which 43 different factors under their particular category were found. After this data collection process was started and two types of data were collected: perception-based and project-based. The data collection was the major challenge of this project, as many construction companies don’t have a formalized structure for data recording, or those that record it in extremely raw form.

2.2 Data Collection

A qualitative and quantitative analysis has been performed. For qualitative data analysis, a questionnaire survey was conducted in order to find out the major contributing factors causing delays and overruns in the construction industry. The questionnaire form was designed to evaluate the factors which has a greater impact on the profit of the construction industry and its optimization breaks the barrier between effective construction and efficient construction. The questionnaire is designed to consist of two different parts. Part A includes personal information of the respondent, i.e., name, designation, organization, experience, and age. Part B contains the questions regarding the problems that contractors and other personnel are facing during construction. The questionnaire was sent to different types of construction industry, including the CEO, Project engineer, Executive engineer, superintending engineer, Managing director, and Planning Engineer. A total of 50 questionnaires were sent, and out of these, 40 were received. After performing the survey, two more types of analysis have been performed based on projects, productivity, and delays. The rating scale of this has been divided from 1 to 5, where 1 represents the lowest importance and 5 represents the highest importance of a particular risk factor.

2.3 Productivity

For productivity, a construction site was chosen, and some activities were considered. Productivities were calculated for each of the selected activities. Two types of productivity were calculated, as planned and as built, and those activities whose productivity came out to be lower than the as planned, the factors behind this low performance were identified.

2.4 Delay Analysis

A delay analysis has also been performed in the same project with some selected activities, and this analysis has also been performed against as-planned and as-built conditions, and those activities that have delays. The reason behind this low performance was found. At the end, the factors behind low productivity and delays were found out and compared with the factors that came from the questionnaire survey. As a result of this comparison, the most common factors between all three analyses have been mentioned. The overall methodology of the study can be seen in Fig.1.

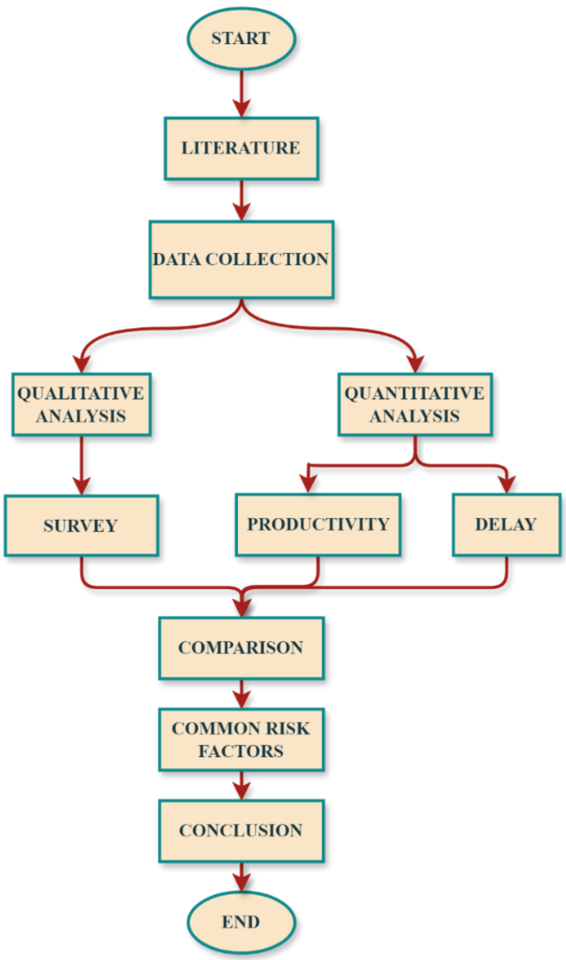

Fig.1. General Methodology

3. Results and Discussion

3. 1 Literature and Survey Results

The study started with the literature, followed by a questionnaire survey. Table 1 shows the factors identified from the literature along with their categories. It also represents the survey results as percentages, which shows the percentages of responses given to a particular factor, so that it can be found out which factors in each category are the major contributors.

Table 1. Factors and Survey Responses

S No.	Factors	Extremely important	Quite important	Average	Somewhat Important	Not important
		1	**2**	**3**	**4**	**5**
Delaying of Material						
1	Inefficient warehouse management	25%	45%	25%	5%	0%
2	Poorly defined responsibilities and coordination of the team	60%	20%	20%	0%	0%
3	Poor estimation or poor planning of materials	40%	35%	20%	0%	5%
4	Late delivery of material	35%	45%	15%	5%	0%
5	The prices of cement and steel increase with an increase in fuel prices	35%	25%	40%	0%	0%
Lack of Tools and Equipment						
6	Insufficient provision of tools	30%	25%	40%	0%	5%
7	Ignorance of maintenance programs leads to inefficient use	30%	60%	10%	0%	0%
8	Overestimates the capacity of a machine	35%	45%	20%	0%	0%
9	Use of old and obsolete equipment and a shortage of spare parts	10%	50%	30%	0%	10%
Poor Site Conditions						
10	Inadequate Space Utilization	30%	40%	25%	5%	0%
11	Ineffective Workplace Technology	20%	40%	25%	15%	0%
12	Poor Lighting	30%	20%	20%	25%	5%
13	Unsafe Working Conditions	45%	25%	15%	5%	10%
Inspection Delays						
14	Incompetent project manager	85%	10%	5%	0%	0%
15	An irresponsible inspector, such as one who is not punctual, abuses authority	15%	25%	45%	15%	0%
Poor Communication						
16	Difference in experience	25%	40%	20%	15%	0%
17	Lack of training	25%	60%	10%	5%	0%
18	Work Pressure	15%	30%	45%	10%	0%
19	Unclear Responsibilities	50%	40%	0%	10%	0%
Contractor Contributes to Work Delays						
20	Lack of Skills Regarding the use of new Technology	55%	40%	0%	5%	0%
21	Lack of Coordination among Subcontractors + general contractor, and subcontractors	55%	40%	5%	0%	0%
22	Often Changing Sub-Contractors	45%	30%	25%	0%	0%
Labour Staff Contribution to Work Delays						
23	Labor Not Skilled Up to The Level	55%	30%	15%	0%	0%
24	Human Resource Planning Not Properly Done	25%	40%	20%	5%	10%
25	Working Hours Restrictions	20%	20%	30%	20%	10%

26	Shortage of Technical Staff	55%	30%	15%	0%	0%
Project Design Contribution to Work Delays						
27	Design Not Fulfilling Project Goals	60%	25%	5%	10%	0%
28	Design Process Takes Longer Than Anticipated	30%	20%	40%	5%	5%
29	Design Errors and Omissions	60%	15%	15%	5%	5%
30	Delays in Design	25%	25%	50%	0%	0%
Financial Feasibility Contributes to Work Delays						
31	Invoices Delay	30%	50%	10%	5%	5%
32	Change in Currency Rate	25%	30%	35%	10%	0%
33	Owner Financial Capacity Change	30%	50%	15%	5%	0%
34	Wrong Cost Estimate	70%	15%	15%	0%	0%
Organizational Factors Contribute to Work Delays						
35	Risk of Employees’ Absence	55%	15%	25%	0%	5%
36	Risk of Employees’ Qualifications (Employees’ Performance)	25%	60%	15%	0%	0%
37	Risk of Poor Self-Esteem	20%	20%	35%	25%	0%
38	Lack of Communication Between Engineer and Architect	35%	50%	5%	10%	0%

In the delay of material, the result shows that poorly defined coordination and responsibilities and poor estimation of material are extremely important factor which has a greater impact on the delay of material. In some cases, inefficient warehouse management and late delivery of materials could also play an important role in material delay, whereas prices don’t have a considerable impact on material delay. In the lack of tools and equipment, the result shows that ignorance of maintenance programs, use of old and obsolete equipment, and shortage of spare parts are leading factors that result in unavailability of tools and equipment, whereas insufficient provision of tools doesn’t have a considerable impact on the shortage of equipment. The unsafe working conditions and poor lighting are significant factors that majorly contribute to making the site condition poor for working, whereas inadequate space utilization and ineffective workplace technology could also play an important role in making the site condition poor. An incompetent project manager is extremely responsible for inspection delays, whereas, irresponsible inspector doesn’t have a considerable impact on inspection delays. Unclear responsibilities have a notable influence on poor communication. Differences in experience and lack of training could also be important barriers in communication, whereas work pressure doesn’t have a significant impact. After seeing all the results from the survey, the table below shows the major contributing factors.

Table 2. Major Factors from the Survey

S No.	Factors
1	Poorly defined responsibilities and coordination of the team
2	Poor estimation or poor planning of materials
3	Risk of Employees’ Absence (Illness, Strike)
4	Wrong Cost Estimate
5	Design Errors and Omissions
6	Design Not Fulfilling Project Goals
7	Labor Not Skilled Up to The Level
8	Shortage of Technical Staff
9	Lack of Skills Regarding Use of New Technology
10	Lack of Coordination among Subcontractors and + general contractor and subcontractors

11	Unclear Responsibilities
12	Incompetent project manager
13	Unsafe Working Conditions
14	Poor Lighting

3.2 Productivity

For the productivity, the data was gathered from the project. The activities in particular projects were: Aluminum louver work, CC Flooring, Epoxy coating, Pouring & Fixing, and Fixing of Aluminum Cladding Panel at the Front. Elevation. Calculation has been divided into two parts. 1st part considers the as-planned data, whereas the 2nd part considers the as-built data. The formula for productivity calculation for each of the activities can be seen in Equation (1).

Formula Used for calculation:

1. Take time for each activity
2. Calculate the total sum
3. Take the average time
4. Divide the time by the unit of product
5. Multiply the result by the number of laborers involved in that activity

$$Productivity = \; Avera\ labors\ /\ unit\ produce \qquad \text{Eq (1)}$$

According to this, the more the productivity, the less the efficiency

The calculated data and results for the Aluminum louver work activity are given below:

Table 3. Productivity for Aluminum Work

As Planned				
Activity Cycle	Shifting to Site Time (Min)	Fabrication Time (Min)	Fixing Time (Min)	Total Time (Min)
1	20	50	45	115
2	20	50	45	115
3	20	50	45	115
Sum				345
Avg Time				115
Hour				1.91
Hour/panel				1.91
Man-hour/panel				3.83
As Built				
Day 1				
1	50	52	50	152
2	55	60	56	171
3	56	65	48	169
Day 2	0	0		0
1	55	69	52	176
2	52	65	45	162

3	59	66	56	181
Avg Time	53.66	60.83	53.41	167.91
Hour	0.89	1.01	0.89	2.79
Hour/panel	0.89	1.01	0.89	2.79
Man-hr / panel	1.78	2.027	1.78	5.59

Fig. 2 represents the graphical representation of productivity for Aluminum work, and it can be clearly seen that the productivity for As-built is lower than As-planned.

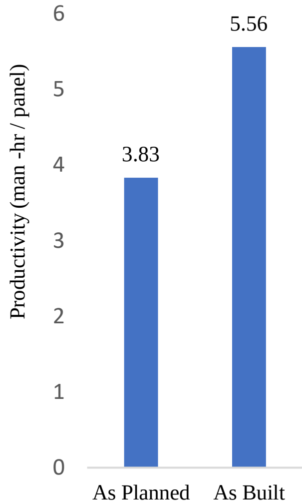

Fig. 2. As Built vs As Planned Productivity for Aluminum Work

By this result, it can be seen that there is a significant difference between the as-planned productivity and as as-built productivity. To find out the reason for this difference, it was realized that most of the time was consumed during the shifting of the panel from the warehouse to the site, and the factor behind this delay is poor warehouse management. The store staff shifted the panel inside the store from which took a longer time than shifting the panel from inside to outside the store, and then shifting the panel to the working site. Most of the time was consumed in moving the panel from the inside of the store to the working site. For the rest of the activities, the productivity can be seen in Fig. *3* for pouring and fixing of panel, CC flooring, epoxy coating, and fixing of aluminum cladding.

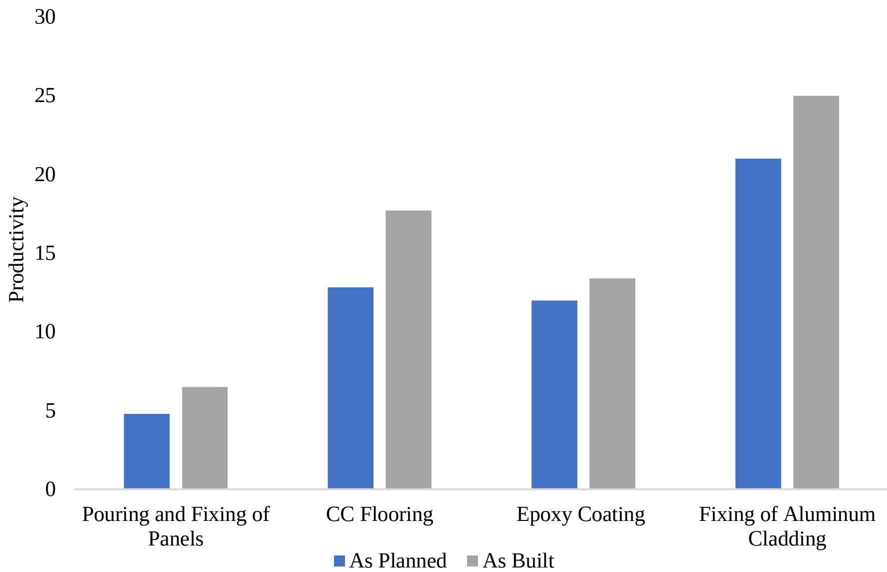

Fig. 3. Productivities

3.2.1 Factors Causing Delays

In the pouring & fixing of the panel, he scaffolding labor was not skilled up to a level, and that is why it took them longer to fix and remove the scaffolding, so the leading factor is lack of skilled labor. In CC Flooring, at night, concrete, due to improper management of the site supervisor of the lighting arrangement, causes extra time for pouring. It causes delays, which decrease productivity, and is a factor leading to poor site management by the contractor. In the case of epoxy coating, there is a slight difference between as planned and actual productivity. At the time of fixing the aluminum cladding, the laborers were not skilled up to the level. While having unskilled labor, the bending, cutting, and fixing of the fabrication takes more time than estimated. So, the factor is unskilled Labor. After all these productivity factors, some more factors were identified, and after this, a delay analysis was also done on the ongoing project, so that some more contributing factors can be identified.

3.3 Delay Analysis

The delay analysis has been performed on a commercial project. The project is Parking Plaza, which has a variety of activities. The contracted cost of the project is 1.063 billion. The planned duration of assigned work is approximately 6.6 months. The activities which were involved in the project execution can be seen in Table 4. This table has two columns: the first represents the ID for the activity, and the second shows the overall description

Table 4. Activities in Delay Analysis

ID	Description
A	Fixing and Pouring at Elevation C (Park Side)
B	Fixing and Pouring at Elevation B (Office Side)
C	Fixing and Pouring at Elevation D (College Side)
D	Fixing and Pouring at Elevation C (Park Side)
E	Fixing and Pouring at Elevation B (Office Side)
F	Fixing and Pouring at Elevation D (College Side)
G	Fixing and Pouring at Elevation C (Park Side)

H	Fixing and Pouring at Elevation B (Office Side)
M	CC Flooring at Grid A-N/1-8 (1st Zone)
N	CC Flooring at Grid A-N/9-15 (2nd Zone)
P	CC Flooring at Grid A-N/9-15 (2nd Zone)
Q	CC Flooring at Grid A-N/1-8 (1st Zone)
AK	Epoxy Coating at Grid A-N/1-8 (Floor)
AL	Epoxy Coating at Grid A-N/8-15 (Floor)
AM	Marking of Bays, Handicap, Zebra Marking, Road

All the mentioned activities above have been analyzed for the delay analysis. Table 5 below shows some of the activities along with their IDs, tasks, start and finish dates, Duration, and predecessor activities. From this particular Table, a network diagram was also created, so that with the use critical path method, the total duration of the particular project can be calculated.

Table 5. As-Planned Schedule of The Project

ID	Task Name	Start Date	Finish Date	Duration	Predecessor
	RCC & Decorative Panel				
A	Fixing and Pouring at Elevation C (Park Side)	01-07-18	06-07-18	6 days	-
B	Fixing and Pouring at Elevation B (Office Side)	06-07-18	08-07-18	3 days	A+1
	Aluminum Louvers				
AN	Fixing of Aluminium Louvers at Elevation B (Office Side)	03-07-18	12-07-18	10 days	A-2
AO	Fixing of Aluminium Louvers at Elevation C (Park Side)	13-07-18	22-07-18	10 days	AN+1
	CC Flooring				
M	CC Flooring at Grid A-N/1-8 (1st Zone)	01-08-18	24-08-18	24 days	J(SS)
N	CC Flooring at Grid A-N/9-15 (2nd Zone)	24-08-18	14-08-18	20 days	M-10
	Epoxy Coating Work				
V	Epoxy Coating at Grid A-N/1-8 (Columns)	15-08-18	18-08-18	4 days	
W	Epoxy Coating at Grid A-N/8-15 (Columns)	19-08-18	22-08-18	4 days	

Fig. 4 represents the CPM Network of the Project. The arrows represent the relationship of an activity with its successor or predecessor activity, while the Critical Path is shown by red red-highlighted box. The longest path of this network is A-B-C-D-E-F-G-H-M-N-P-Q-AK-AL-AM. The Zero (0) float value shows the critical activity.

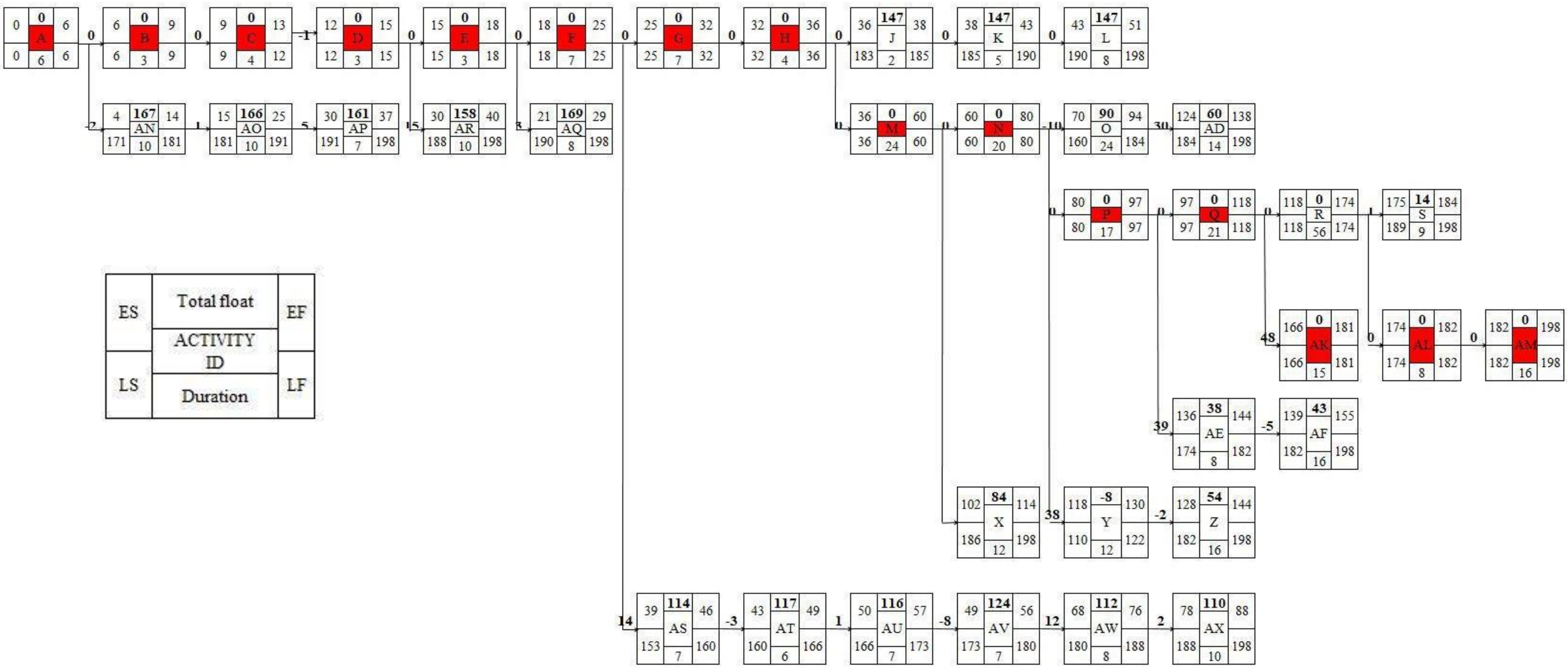

Fig. 4. As-Planned Schedule Network Diagram

For the As-built schedule of the project, a similar strategy will be followed, but this time the data has been gathered from the actual construction. Table 6 represents activities along with their IDs, tasks, start and finish dates, Duration, and predecessor activities.

Table 6. As-Built Schedule of The Project

ID	Task Name	Start Date	Finish Date	Duration	Predecessor
	RCC & Decorative Panel				
A	Fixing and Pouring at Elevation C (Park Side)	1-Jul-18	5-Jul-18	5 days	-
B	Fixing and Pouring at Elevation B (Office Side)	7-Jul-18	11-Jul-18	5 days	A+1
	Aluminum Louvers				
AN	Fixing of Aluminium Louvers at Elevation B (Office Side)	3-Jul-18	12-Jul-18	10 days	A-2
AO	Fixing of Aluminium Louvers at Elevation C (Park Side)	13-Jul-18	22-Jul-18	10 days	AN+1
ID	**Task Name**	**Start Date**	**Finish Date**	**Duration**	**Predecessor**
	CC Flooring (As Built)				
M	CC Flooring at Grid A-N/1-8 (1st Zone)	1-Aug-18	23-Aug-18	23 days	J(SS)
N	CC Flooring at Grid A-N/9-15 (2nd Zone)	10-Aug-18	29-Aug-18	20 days	M-10
	Epoxy Coating Work (As Built)				
V	Epoxy Coating at Grid A-N/1-8 (Columns)	15-Aug-18	20-Aug-18	6 days	
W	Epoxy Coating at Grid A-N/8-15 (Columns)	21-Aug-18	26-Aug-18	6 days	

Fig. 5 shows the CPM network diagram for the As-Built project, and the longest path of this network is A-B-C-D-E-F-G-H-M-N-P-Q-AK-AL-AM. It can be seen that the duration has been increased as compared to the As-planned project.

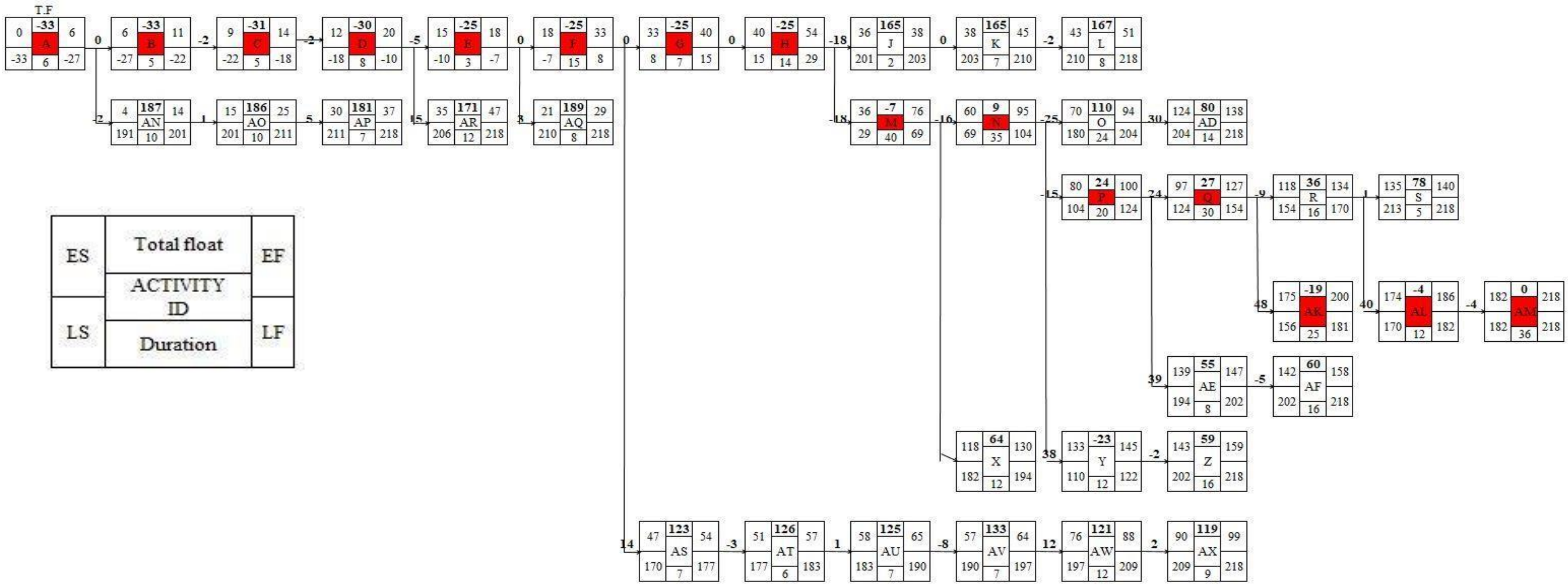

Fig. 5. As-Built Schedule Network Diagram

3.3.1 As-Planned Vs As-Built Analysis

Table 7 shows the as-planned vs as-built analysis and gives insights into the delay, that how much the activities are delayed. The planned duration of the project was 158 days, but it was delayed by 93 days, and the project was completed in 251 days.

Table 7. As Planned vs As Built

ID	As-Planned	As-Built	Delay
A	6	6	0
B	3	5	2
C	4	5	1
D	3	8	5
E	3	3	0
F	7	15	8
G	7	7	0
H	4	4	0
M	24	40	16
N	20	35	15
P	17	20	3
Q	21	30	9
AK	15	25	10
AL	8	12	4
AM	16	36	20
	158	**251**	**93**

For better representation of the delays, Fig. **6** was created, in which it can be seen that most of the activities have delays except activities “D”, “G”, and “H”. The Rest of the activities have delays; also, activity “M” has experienced the highest delay, which is 16 days, followed by activity “N”, 15 days.

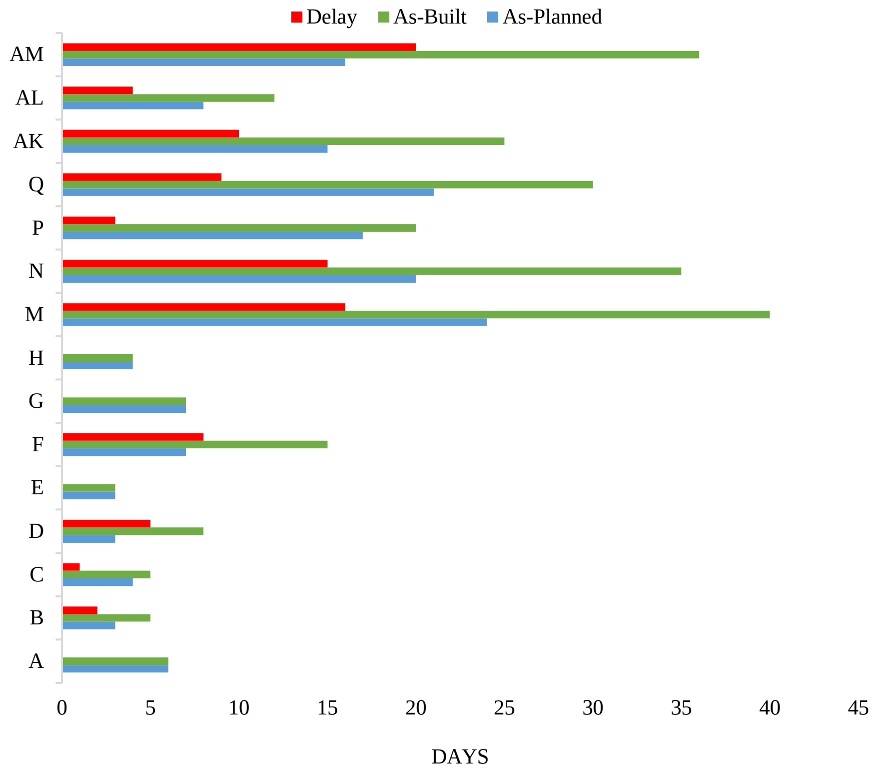

Fig. 6. As-Planned Vs As-Built Comparison

3.3.2 Factors from Delay Analysis

It has been seen that there are differences between planned versus actual performance. Below are the factors that have been observed at the construction site, which are eventually the reason for the delays

➢

1. Mismanagement of Subcontractor (Labour Absence from the site)
2. Poor Lightning
3. Mismanagement of Subcontractor (Labour Absence from the site)
4. Unskilled labour "Labour not skilled up to level" same factor (Delay in the completion of scaffolding)
5. Warehouse Mismanagement (Cement Delivery delayed by the Procurement team of SBL)
6. Mismanagement of Subcontractor (Labour Absence from the site)
7. Mismanagement of Subcontractor (Late arrival of labour and mason on site, plus 1-day absence)
8. Warehouse Mismanagement (Cement Delivery delayed by the Procurement team of SBL)
9. Warehouse Mismanagement (Material Delivery delayed by Kansai Paint Pvt LTD)

These 09 factors are the main cause of delay in this project because to effectiveness of the project is decreasing. In order to increase the effectiveness of the project, control these factors.

3.4 Comparison

All the analysis, including surveys, productivity, and delays, has been performed and provided various kinds of factors behind the low performance. It is important to find out the common factors that can be found in all of these analyses. Upon the comparison of all the analyses, Table 8 represents the common factors from all three analyses, and in total, there are 4 common factors.

Table 8. Common Factors

S No.	Factors Surveys	Factors Productivity	Factors Delays
1	Poorly defined responsibilities and coordination of the team		
2	Poor estimation or poor planning of materials		
3	Risk of Employees’ Absence (Illness, Strike)		
4	Wrong Cost Estimate		
5	Design Errors and Omissions		
6	Design Not Fulfilling Project Goals		
7	Labor Not Skilled Up to The Level	Unskilled Labor	Unskilled Labour
8	Shortage of Technical Staff		
9	Lack of Skills Regarding Use of New Technology		
10	Lack of Coordination among Subcontractors + general contractor and subcontractors	Mismanagement Subcontractor	Mismanagement of Subcontractor
11	Unclear Responsibilities		
12	Incompetent project manager		
13	Unsafe Working Conditions	Warehouse Management	Warehouse Mismanagement
14	Poor Lighting		Poor Lighting

3.5 Common Factors

Fig. **7** shows all four common factors that were found by comparing all three analyses. These four actually represent all the other areas of construction activities. The result indicates that Lack of Skills and Lack of Coordination by contractors cause more work delays compared to Poor Site Management by Contractors and frequent changes of subcontractors. Unskilled labour and a shortage of technical staff are highly contributing in delaying of work. Improper planning of human resources could also be an important contributor in delaying of work, whereas work hours’ restriction doesn’t have a considerable impact. Errors, omissions in design, and neglecting project goals in design lead to more delays in work, whereas delays in design and longer design process time have a moderate impact. Wrong cost estimation is an extremely critical factor that causes major work delays, whereas invoice delay and change in Owner Financial Capacity could also be important barrier that causes work delays, whereas change in currency rate doesn’t have a considerable impact. The employees’ absence causes major work delays, whereas employees' performance and communication barriers between the Engineer and the Architect could also play an important role in delaying work, whereas poor self-esteem doesn’t have a considerable impact.

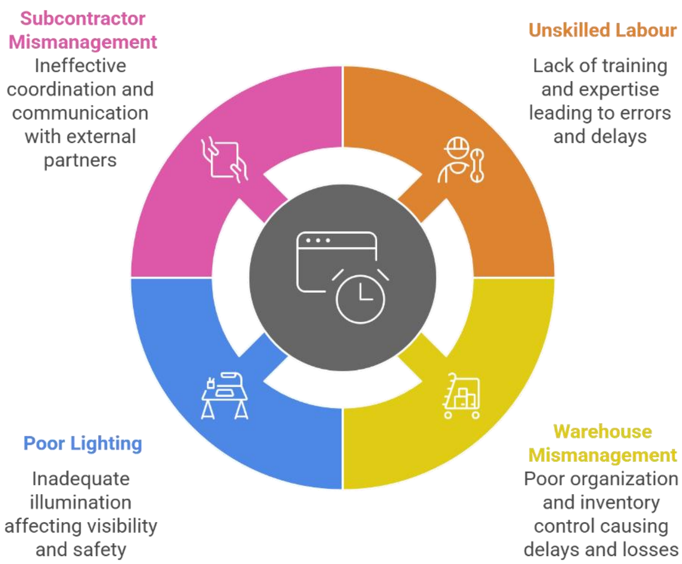

Fig. 7. Common Factors

4.0 Conclusion

This study finds that the four factors that cause construction delays, inefficiency in productivity, in the context of the study, involve: unskilled labor, mismanagement of the warehouse, mismanagement of subcontractors, and poor site conditions. Although financial limitations and design issues also contribute to this, the results indicate that the biggest contribution to the minimization of delays would occur with the improvement of managerial practices and workforce competencies. The research suggests the improvement of supply chain and warehouse management systems, recruitment and training of quality labor, and subcontractor work on the basis of the previous performance and reliability.

Also, it is necessary to implement responsibility in designing accuracy and cost estimation to reduce risks during the planning level. This study offers a wider concept of the identification and resolution of delay factors by combining the information based on perception and real project performances. This study is especially useful in the construction projects of developing countries, where inefficiencies at the systemic level usually reduce progress. If adopted, these suggestions have the potential to assist construction organizations in obtaining more accurate scheduling, greater productivity, and a higher success rate of a project.

4.1 Recommendation

From the above results following recommendations are made:

1. Warehouse management and procurement department staff should be very experienced and competent. If the company wants to be successful, its supply chain management should be very strong and versatile
2. Labor staff should be hired by judging their past competency and productivity results.
3. Labor productivity is the backbone of any organization to make it either successful or unsuccessful
4. The work or activities are to be awarded to subcontractors based on their past experiences.

5.0 References

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