

IDENTIFICATION OF THE MOST SIGNIFICANT CONTRACTORS RELATED CAUSES OF DELAY IN SRI LANKAN CONSTRUCTION INDUSTRY

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Introduction

In construction, delay is the period that elapses after the completion date specified in the contract and as mutually agreed upon by the contract's parties. One of the most reoccurring issues in the construction sector around the world is delay (Jadhav, 2018). Delays can lead to many negative effects and one delay could result in the emergence of more delays (Muralidhar, 2018). Large rate of delay in project delivery is a major criticism faced by the Sri Lanka's construction sector. Despite the type or size of the construction project, majority of construction projects are prone to delays, and timely completion is typically exceptional (Jayalath, 2010). Cost, time, and quality equally contribute to the project success (Ramalee, 2016). Therefore, project delay directly impacts on project success. Delays may be caused by one or both contracting parties, a third party who is not a party to the contract, or external forces. Contractor is the party who is mostly responsible for construction delays (Farooqui, 2007). Therefore, taking an endeavour on mitigation of contractor related delays can significantly effect on reducing construction delays. Quantity Surveyor is responsible for the cost aspect of a project and delays are a major barrier for Quantity Surveyors to ensure that cost overrun does not take place (Rathnayake, 2022). Therefore, it is obvious that as a Quantity Surveyor, taking an endeavour on mitigating contractor related delays is important to enhance the performance of Quantity Surveyors. Prior to mitigating them it is at utmost important to identify the most significant causes of contractor related causes of delay in Sri Lanka, since it makes it simple to choose what should be addressed first and what should be prioritized.

Methodology

The entire research was appraised through questionnaire surveys and interviews held among construction industry professionals in Sri Lanka. This was a combination of both qualitative (interviews) and quantitative (questionnaire survey) analysis. At first, 15 contractor related causes of delay were identified by undertaking a literature review.

A detailed questionnaire was circulated across the construction industry professionals who are actively employed in the Sri Lankan construction sector, and they were

chosen by using stratified random sample technique. In section A of the questionnaire respondent’s experience on occurrence of contractor related causes of delay was investigated by using a closed-ended question.

In Section B the respondents were asked to rank the 15 causes of delay which were identified through the literature review accordingly to a five-point Likert Scale, while “1” representing “Unimportant” and “5” representing “Very important”. A semi structured interview was conducted using open ended questions for further clarification and explanations on contractor related causes of delay in Sri Lanka. The interviewees were chosen by employing the purposive sampling method. The collected data was analysed using Microsoft Excel and Relative Indices (RI) techniques. The frequency index analysis was employed to rank the factors which gathered through literature survey in ascending order of the agreement as the most significant Contractor related causes of delay in Sri Lankan construction industry.

$$\text{Frequency Index (FI)} = \frac{\sum_{i=1}^5 ai \times fi}{H \times N}$$

Equation 1: Frequency Index (FI)

Results & Discussion

According to the responds received for the questionnaire survey, more than 90% of respondents had experienced Contractor related delay on construction projects, highlighting it as a severe issue in the construction sector. Below table indicates the results of frequency index analysis.

According to the above table ineffective project planning and scheduling (D03) was ranked in the first place which means it is the most significant contractor related cause of delay in Sri Lanka. Through the conducted interview it was revealed that unavailability of a proper estimate in activity duration and number of resources, inefficient work breakdown structure and ignoring critical tasks are the main reasons for ineffective project planning and scheduling. Poor site management and supervision (D01) ranked as the second most frequent reason for contractor related delay. During the interview one interviewee explained that poor site management includes loss of material on site, damage of material on site, ineffective storing and handling of resources and regular material shifting from one location to another due to the lack of a defined storage area. The third most significant contractor related cause of delay was rework due to errors during construction (D05). One interviewee mentioned that repeating a task that was incorrectly completed the first time can be due to causes such as issues in the construction schedule, errors in the design, improper construction and materials do not conform to the requirements.

Table 1: Rank of the Contractor related causes of delay based on the frequency of occurrence

Code	Cause of Delay; Contractor related	Response					Frequency Index	Rank
		1	2	3	4	5		
D01	Poor site management and supervision	1	1	3	9	21	0.874	2
D02	Poor communication and coordination	1	2	2	12	18	0.851	5
D03	Ineffective project planning and scheduling	0	1	3	12	19	0.880	1
D04	Resource shortage (material, labor, machinery, and equipment)	1	2	10	13	9	0.771	7
D05	Rework due to errors during construction	1	0	4	12	18	0.864	3
D06	Inadequate cash flow management (Financial difficulties of the Contractor)	0	1	15	12	7	0.763	9
D07	Inappropriate construction methods	4	4	11	11	5	0.663	11
D08	Insufficient quality control	2	11	9	10	3	0.611	13
D09	Inadequate contractor experience	6	7	7	9	6	0.606	14
D10	Equipment failure/ breakdown	5	8	8	11	3	0.594	15
D11	Conflicts between the contractor and other parties	1	8	11	9	6	0.651	12
D12	Low productivity of labor	1	1	4	14	15	0.834	6
D13	Slow preparation of shop drawings and samples of materials	1	2	10	15	7	0.743	10
D14	Delay payment to supplier/subcontractor	1	1	13	14	6	0.765	8
D15	Slow and poor decision-making process	0	3	1	13	18	0.863	4

According to the table (*Table 01*) the fourth most significant cause of contractor related delay is slow and poor decision-making process (D15). The key reason for slowdown decision making is the Contractor's slow inspection of the decision-making procedure. Poor communication and coordination (D02) ranked as the fifth most frequent cause for contractor related delay. Difficulties in coordination between several parties of the project, poor information dissemination and attitude of the parties can be identified as the reasons for this. According to the analysis, insufficient quality control, inadequate contractor experience and equipment failure/ breakdown were ranked as the three least leading Contractor related causes of delay in Sri Lankan construction context. That means these factors do not take place often in the industry and have a very slight impact on delays.

Conclusion

As per the results, it was found that delays which are attributable to contractors are still happening in the Sri Lankan construction industry. Through this study 15 causes of contractor related delay were identified, and they were ranked based on the frequency of occurrence of every cause of delay. Ineffective project planning and scheduling, poor site management, supervision, and rework due to errors during construction were ranked as the top three most occurring causes of contractor related delay in Sri Lanka. Furthermore, this study summarized 15 causes of delay attributable to contractors and one can carry out research in future suggesting delay mitigation strategies for reducing causes of delay explained in this study. By minimizing contractor related causes of delay success rate of construction projects in Sri Lanka can be increased and it directly contributes to enhance the overall performance of construction industry.

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