Activity Level Delay Analysis in Construction: Theoretical Framework

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Abstract—Construction delay is a foremost problem faced by the construction industry in almost all countries in the world. There is no proper measuring method of time waste and all the causes of time waste are not precisely predictable. Many delay studies have concentrated on time delay analysis of the entire project schedule and there has been no attempt made for time delay analysis at discrete activity level. Extensive research is required for activity oriented time waste in construction. Study needs to be carried out on reason, causes and remedies for reduction in delay. The delay in construction project could be reduced by reducing activity oriented time waste generated and can be tackled at micro level thus enhancing the overall efficiency of the project.

Key words: Delay, Time Waste, Discrete Activity Level, Activity Oriented Time

I. INTRODUCTION

Construction industry is more challenging than other industries due to its unique nature, every project is one of a kind, many conflicting parties are involved, projects are constrained by time, money, quality and high risk. Delay occurs in almost every construction project and their magnitudes vary considerably from project to project, ranging from a few days to years. It is generally understood that construction delay is a critical factor affecting the delivery of construction projects in terms of time, budget and the required quality. However, it is very important to identify the exact causes and their significance in order to minimize and avoid the impact of delays in construction projects.

II. OBJECTIVES

The objective of the present study is to analyse various literatures on finding time overrun in constructions and to understand the drawbacks of these studies. It is also aimed at recommending an effective technique to reduce the present problem with a practical solution that could be implemented at construction sites.

III. MAJOR FACTORS EFFECTING TIME DELAY

Major factors that cause time delay are identified and listed below

A. Manpower:

A shortage of skilled labour can result from an increase in the demand for labour which is due to the increase in demand for the goods or services provided. Another reason for labour shortage is the global economic crisis. The labours chose to reside in places with low living costs because their salaries are insufficient to enable them to reside in large cities with higher living costs.

IV. METHODS

The paper explores and synthesises prior studies on the construction delay by examining what causes have been identified and what solutions have been proposed.
A. Literature Review:

Muhwezi, Acai et al. (2014) have done research on factors causing delays on building construction projects in Uganda. 81 project delay factors were identified through literature study. The research classified the causes of delay under four main groups such as consultant related, contractor related, client related and externals related and then assessed their impact on delay using Relative Importance Index (RII). The study concluded that consultant related category had the highest RII value followed by client related, contractor related and external related. Also the key factor that was found significant was the “corruption tendencies”.

Ibrahim, Amund et al (2012) conducted a study to investigate the time performance of road construction project at Palestine. The causes for delay were identified and their severity was measured from the point of view of contractor and consultant. The data were collected through field survey and was analyzed by severity index. The top 5 severe causes for delay was concluded as political situation, segmentation and limited movement between areas, award project to lowest bid price, progress payment delay by owner and shortage of equipment.

Yang and Wei (2010) made a study on delay problems in planning and design phases rather than focusing on finding causes of delays in construction phase. A questionnaire survey was conducted and the identified causes of delay were ranked. The study was conducted among the engineers in companies of public construction projects in Taiwan. It was stated that identifying the causes of schedule delay and preventing them from occurring are better than resolving subsequent delay related disputes. The delays that encountered in critical path affects the completion of the project on time. In this study the analysis method involved the importance frequency matrix which was used as an index for evaluating the suitability of selected causes. Relative importance index was used to evaluate the comparative importance of a single item to others. The most significant cause of delay identified was the ‘change in client’s requirement’. It was concluded that clear scope definition and well-structured configuration management using project management approach are required to reduce the occurrence of delays and resolving possible delay disputes. The findings of the research were a good justification for many clients who usually change their requirements during planning and design phases that really delay construction projects.

B. Critical Review:

There have been many studies of delay in construction, and this type of study continues to be popular in construction management research. But it is seen that most studies fail in providing clear recommendations for the improvement of project management practice. Moreover, the majority of recommendations are general and not devoted to solving the difficulties associated with particular causes of delay. Thus a question arises of what contribution the previous delay studies have made in identifying the causes of delay and practical steps to reduce delays.

V. CONCLUSION

Most of the studies fail to recommend ways to overcome the causes of delay identified. Different reasons may be given for this, such as that the aims of the study were limited to identifying causes, or that funding was limited. However, it can hardly be argued that a delay study would have other motivation than to facilitate the removal of causes of delay or at least to minimize their impact. To mitigate delay to 100% is not practically possible, as the delay occurring may due to predictable or unpredictable factors. But it could be cut short considerably by recommending suitable methods.

VI. RECOMMENDATIONS

The study shows that majority of the works so far conducted has concentrated on time delay analysis of the entire project schedule and there has been no attempt made for time delay analysis at discrete activity level. Through such an approach the delays in constructions could be cut short effectively. Extensive research is required for activity oriented time waste in construction. Study needs to be carried out on reason, causes and remedies for reduction in delay. One of the major causes of delay is attributed by systematic addition of ‘time waste’ in various activities involved. This waste time is the productive time that could have been used for another activity. Thus delay in construction could be reduced by reducing activity oriented time waste generated. For effective planning, time required for each and every activity should be scheduled in advance with proper allocation of resources. Thus delays could be tackled at micro level and overall efficiency of project could be achieved.

Studies conducted on activity oriented time waste are rare. This is mainly because there is no practice of recording time waste at micro level in sites. Also there is no proper measuring method of time waste and all the causes of time waste are not precisely predictable.

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REFERENCES

