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Factors Influencing Construction Projects Delays: A Literature Review

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Abstract

Delays in a construction project, not only affect project performance in terms of time but they also impact project cost and quality, either directly or indirectly. Review of related previous research was conducted in order to identify the root causes that lead to the delay in construction project. It was found that every involved party in a construction project could contribute to delay in construction projects. Studies also revealed that, financial problems and management-related factors are among the highest ranked major causes of delays in construction projects. Every party involved in construction projects plays an important role in mitigating and minimizing delays in construction projects. Good coordination among parties and a strong management team is essential to better project management.

Keywords

Delay, Construction projects, Causes, Effects,

1. Introduction

The construction industry is one of the riskiest industries exposed to many predictable and unpredictable risks that greatly impact project performance in terms of time, cost and quality. Typically, most of the construction project experiencing delay in completion and it is a global phenomenon which Malaysian construction industry also have no exception (Sambasivan & Soon, 2007) no matter how big or small of the project and type of the project. The occurrences of delay in a construction project will normally give a negative impact to the project performance. Aibinu & Jagboro (2002) conducted a survey on the effects of delay on the construction projects in Nigeria. Six major effects have been identified: time overrun, cost overrun, disputes, arbitration, litigation and total abandonment of projects.

Completing projects on time is among of the most important criteria for project success. Construction delay could be defined as the time overrun either beyond completion date as specified in the contract or beyond the date that the parties agreed upon for delivery of a project (Assaf & Al-Hejji, 2006). The delayed event is also defined as a situation when the contractor and the owner either jointly or severally contribute to the non-completion of the project within the original, the stipulated or agreed contract period (Aibinu & Jagboro, 2002). Delays can occur in all phases of a construction project (Acharya, Lee, Kim, & Lee, 2006), however all parties in construction projects agree that delays occur mostly during the construction phase (H. Abdul-Rahman et al., 2006).

2. Literature Review

2.1 Delay Classification

According to Yates & Apstein (2006), there are generally four types of delays in construction projects. The followings are the types of delays occurred in construction projects (Rubin et al. 1983; Bramble and Callahan 1987 as cited in Yates & Apstein, 2006):-

- Non-excusable delays
- Non-compensable excusable delays
- Compensable excusable delays
- Concurrent delays

Non-excusable delays result from the action or inaction of the contractors (Yates & Apstein, 2006). These delays might be due to inadequate scheduling or mismanagement, construction mistakes, equipment breakdowns and staffing problems (Ahmed, Azhar, Castillo, & Kappagantula). In the event of this type of delays the contractor does not entitle any extension of time to the project schedule. On the other hand, excusable delays can be further classified into two types: non-compensable excusable delays and compensable excusable delays. Non-compensable excusable delays are delays due to unforeseeable causes and beyond the control of the contractor and the owner (Yates & Apstein, 2006). Examples of unforeseen events that are beyond the control of both parties are: "Act of God", force majeure and labour and materials shortage beyond the expectations of both parties (Baram, 2000). This type of delay, will relieved the contractor from any contractually imposed liquidated damages for the period of delay and grant them an extension of time (Ahmed, et al.). However, there will be no compensation given to the contractor for the cost of delay (Ahmed, et al.).

Compensable excusable delays are delays that are not the fault of the contactor but caused by the owner. These delays may be the result of: the owner's failure to give the site to the contractor, changes in works by the owner, defective design by the designer, and differing site conditions (Yates & Apstein, 2006). In the event of this type of delays, the contractor will entitle both a time extension and compensation for any cost incurred due to the delay. Concurrent delays are common in construction projects especially during the peak of a project when multiple-responsibility tasks are being performed concurrently (Baram, 2000). Concurrent delays occur when two or more delayed events occur at the same time and the delayed events are caused by the client and the contractor. In the event of concurrent delays, it is quite challenging and difficult to determine who is responsible for the concurrent delay. Both owner and the contractors use concurrent delays as a defensive tool against each other where the owner will protect their interest to collect liquidated damages while the contractor will try their best to waive their own delays in order to avoid liquidated damages (Baram, 2000). Assessing concurrent delays will lead to various issues (Ibbs, Nguyen, & Simonian, 2011) and if it cannot be done between both parties, legal proceedings might be needed to resolve the issue (Yates & Apstein, 2006).

2.2 Causes of Delay in Construction Projects

Many studies have been conducted to identify the root causes that lead to delayed events in construction projects. A number of variables contributing to project delays were identified following a thorough literature review.

Ahmed, et al. in their study on the construction delays in Florida indentified that the most common types of delays in a construction project were excusable compensable delay (48%) and non-excusable delay (44%). Meanwhile, excusable non-compensable delays were found to be very uncommon in a construction project (8%).

Fugar & Agyakwah-Baah (2010) studied the causes of delays in building construction projects in Ghana and concluded that financial group factors ranked highest as leading causes of construction delay followed by material group factors, and scheduling and controlling factors. El-Razek, Bassioni, & Mobarak (2008) has conducted a similar study in Egypt and it was found that most of the delayed events

were caused by financial-related factors such as: financing by contractor during construction, delays in contractor's payment by owner, and partial payment during construction. Joint effort based on teamwork was suggested in order to reduce the delay in construction projects.

In the study of Marzouk, El-Dokhmasey, & El-Said (2008) which only focused on construction engineering-related delays, all respondents agreed that, mistakes/changes in the design documents provided by the employer was the most important cause of delay while the least important cause of delay is the delay in the approval stage because of unforeseen conditions which take place during the approval of the workshop drawing stage. A knowledge based expert system model for engineering related delays has been developed which gives advice on the claim entitlement, responsibility and compensability of claims.

While many studies focus on causes of delay during the construction phase, Yang & Wei (2010), conducted a study on the causes of delays during the planning and design phases. The study found that a client is responsible for most of the delay causes in both the planning and design stage. Their study revealed that, changes in client's requirement were found to be the most common causes of delay in planning and design stage. Enshassi, Al-Najjar, & Kumaraswamy (2009) investigated the factors contributing to time overrun on a construction project in the Gaza strip and the result indicated strikes and border closure, lack of material and late delivery of material to the site are the three major factors contributes to delays. In order to minimize material shortage delays, it is recommended by the authors for the contractor to be more conscious on the construction materials and logistic matters.

The next similar study was conducted by Toor & Ogunlana (2008), who identified that problems related to designers, client, contractors and finance are among the top problem. Nevertheless, a multicultural and multilingual environment, large number of project participants and involvement of foreign designers are not very significant problems causing delay in large construction project in Thailand. Using a questionnaire distributed to the construction participant involved in a construction projects in Vietnam, the study by Le-Hoai, Lee, & Lee (2008) identified that most of the causes of delay and cost overrun in construction projects resulted from human and management problems such as poor project site management and supervision and poor project management assistance. Therefore, the researchers suggested that improving the ability of managers is essential.

Assaf & Al-Hejji (2006) conducted a survey to determine the causes of delay and their importance to the project participant (owner, consultant and contractor). The result indicated that all three parties have reached agreement that "change orders by the owner during construction" are the most common causes of delay in a construction project. Changes in government regulation, traffic control and restriction on site and social and cultural factors were found to be the least significant factors that could contribute to delayed events.

The study by Lo, Fung, & Tung (2006) revealed that unforeseen ground conditions, poor site management and supervision, client's variation, inexperienced contractors and inadequate contractor resources are among of the top ten most significant causes of delay in civil engineering projects in Hong Kong. As proposed by the authors, essential measures to mitigate delays include: thorough site investigation, strong management team, continuous professional development programs and training and establishing a good communication network.

Al-Momani (2000) conducted a study to investigate the causes of delays on 130 public projects in Jordan. Types of projects investigated include: residential, office and administration buildings, school buildings, medical centers and communication facilities. Factors related to designers, user changes, weather, site conditions, late delivery, economic conditions and increase in quantities were found to be significant factors that contributing to delays in a construction project.

2.3 Construction Delays in Malaysia

Delay is recognized as one of the common, costly, complex and risky problems come across in a construction projects (Ahmed, et al.). It is a global phenomenon which Malaysian construction industry is no exception (Sambasivan & Soon, 2007).

A number of studies have been carried out on the issues related to construction delay in the Malaysian construction industry. Abdul-Rahman, Takim, & Min (2009) conducted a study on financial related causes that lead to delay in construction projects. Findings from the study revealed that, the major financial-related causes that lead to delay were poor cash flow management, late payment, insufficient financial resources and financial market instability. The survey also identified causes for each of the above-mentioned four major causes. These causes include: a contractor's instable financial background, a client's poor financial and business management, difficulties in obtaining loan from financiers and inflation. As indicated in the survey findings, clients play an important role in reducing the impact of financial problems to the project delay. As suggested by the respondents, prompt payment by the client, practicing 'financial assignment' among client, contractor and supplier, divide the housing development into section, be smart in choosing paymaster and be careful in accessing risk are among of the mitigation measures that can be implemented in order to prevent/mitigate the problems of delay due to financial problem.

Sambasivan & Soon (2007) conducted a study aiming to identify the factors causing delays and their impact on project completion in the Malaysian construction industry. Ten major factors causing delays in the Malaysian construction industry as identified in the study were: (1) contractor's improper planning, (2) contractor's poor site management, (3) inadequate contractor's experience, (4) inadequate client's finance and payment for completed works, (5) problems with subcontractors, (6) shortage of material (7) labor supply, (8) equipment availability and failure, (9) lack of communication, and (10) mistakes during construction stages.

In addition, Alaghbari, Kadir, Salim, & Ernawati (2007) identified the significant factors causing delay in building construction projects in Malaysia. Findings from the survey show that financial problems both from the contractor's side and the owner's side are the main problems that cause delay in construction projects in Malaysia. Coordination problem was found to be the second most important factor causing delay followed by material problems. Since financial problems are the major causes of delay in construction projects, the authors recommends that financial and technical support are very crucial in order to minimize delay in construction projects.

Othman, Torrance, & Hamid (2006), conducted a time performance survey on civil engineering project in Malaysia. Data that has been collected from project files of completed government's civil engineering project which has been completed between 1999 and 2003 revealed that, excusable delays were found to be the common causes of delay in most of the civil engineering projects compared to project characteristics. The authors suggest that the construction time in civil engineering projects can be improved if the excusable delay can be minimized.

As it becomes a major problem in a construction project, Abdul-Rahman, Yahya, Berawi, & Wah (2008) has come out with a conceptual delay mitigation model using a project learning approach. The study indicated that, poor management of project knowledge in construction industry would lead to repeated mistakes, slow and wrong decision making. This would directly lead to construction project delays. Result from the case studies suggests that, the application of project learning practice could prevent future project delay.

3. Research Method

The aim of this paper is to identify the factors contributing to construction project delays. In order to achieve the research aim, the root causes of construction delays have been derived through an extensive review of the current literature based on previous studies conducted by various researchers.

4. Conclusion

Findings from literature revealed that every party in construction project could contribute to a project delay. Financial problem and management-related matters such as poor site management, poor labour and material management will lead to project delay. Mitigating a problem of delay is not a responsibility of one party only, every party involved in construction projects should work together in order to mitigate and minimize the problem of delay in a construction project. Good and strong management teams together with good communication amongst parties involved is essential not only to avoid delay in construction project but also to ensure the successful of the project.

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