

**THE FACTORS AND EFFECT OF DELAY IN GOVERNMENT
CONSTRUCTION PROJECT (CASE STUDY IN KUANTAN)**

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**A thesis submitted in partial fulfillment of the
requirements for the award of the degree of
Bachelor of Civil Engineering**

**Faculty of Civil Engineering & Earth Resources
Universiti Malaysia Pahang**

NOVEMBER 2010

ABSTRACT

The problem of delays in government construction industry is a global phenomenon and there is no exception. The main purpose of this study is to identify the delay factors and the effect on the project completion. Earlier study either considered causes or the effects of project delays, separately. This study takes an integrated approach and attempts to analyze the impact of effects. A questionnaire survey was conducted to identify the causes and effects delay from contractors and clients. About 40 respondents participated in the survey. This study identified the most important causes of delay from a list 45 different causes and 5 different effects of delay and the recommendation to reduce the delay. The most important causes were delays in contractor's payments to subcontractors, shortage of material in construction, delays in sub-contractors, change in material, the weather condition, shortage of manpower (skilled, semi-skilled and unskilled labour), construction works involve huge amounts of money, unpunctually material delivery, labour productivity, and unavailability of incentives for contractor for finishing ahead of schedule. Six main effects of delay were cost overrun, rescheduling and rearrangement of, litigation, disputes, and arbitration.

ABSTRAK

Masalah kelewatan industri pembinaan dalam projek kerajaan merupakan fenomena global dan tidak terkecuali. Tujuan utama dari penelitian ini adalah untuk mengenalpasti faktor kelewatan dan kesan pada penyelesaian projek. Permulaan kajian adalah mengenai penyebab atau kesan daripada kelewatan projek, secara berasingan. Penyelidikan ini menggunakan pendekatan bersepadu dan upaya untuk menganalisis kesan-kesan. Borang kaji selidik dilakukan untuk mengenalpasti penyebab dan kesan kelewatan daripada kontraktor dan pelanggan. Sekitar 40 responden mengambil bahagian dalam tinjauan. Kajian ini mengenalpasti penyebab yang paling penting dari kelewatan dari senarai 45 punca yang berbeza dan 5 kesan yang berbeza kelewatan dan cadangan untuk mengurangkan penangguhan. Punca paling penting adalah penangguhan dalam pembayaran kontraktor kepada subkontraktor, kekurangan bahan dalam pembinaan, kelewatan di sub-kontraktor, perubahan dalam material, keadaan cuaca, kekurangan tenaga kerja (tenaga kerja pakar, separuh pakar dan tidak pakar), kerja pembinaan melibatkan jumlah wang yang banyak, seperti bahan penghantaran, produktiviti tenaga kerja, serta tidak dapat insentif bagi kontraktor untuk menyelesaikan lebih cepat dari jadual. Enam kesan utama kelewatan adalah kelebihan kos, penjadualan dan tatacara ulang dari, litigasi, pertikaian, dan timbangtara.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Project success can be defined as meeting goals and objectives as prescribed in the project plan. A successful project means that the project has accomplished its technical performance and maintained (Yaw et al 2003).

The industry had shown the comfortably economy for the country because its demands depend on the increasing of the growing economy. The declining of economy had shown by the declining the construction activity which had appear a lot of problem in process to finish and then appear the delay in construction project which it scratching of image of our country. The dependent on lot of parties makes this industry become complex. Thus, the main objective of construction is to finish the construction on time and within cost which agreed and to achieve in the good quality.

Delay could be defined as an act or event that extends the time required to perform the tasks under a contract. It usually shows up as additional days of work or as a delayed start of an activity (G. Sweis et al 2007).

According to Sadi A. Assaf et al in construction, delay could be defined as the time overrun either beyond completion date specified in a contract, or

beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule and is considered as common problem in construction projects. In some cases, to the contractor, delay means higher overhead costs because of longer work period, higher material costs through inflation, and due to labour cost increases.

Time, cost and quality are the basic of successful construction which include also the safety and its environment. Time and cost had parallel relationship which the increasing of the time will make the increasing of the cost. Then, the controlled of time is really important for avoid any loss to the contractor. The time that already discuss is the period which is the schedule for the activities from beginning until finish the process of planning.

1.1 Problem Statement

Failure to achieve targeted time, budgeted cost, designer changes or errors, user changes, weather, late deliveries and specified quality result in various unexpected negative effects on the projects are the reason that delay occur. Normally, when the projects are delayed, they are either extended or accelerated and therefore, incur additional cost. The normal practices usually allow a percentage of the project cost as an allowance in the contract price and this allowance is usually based on judgment.

In additional, the increasing of the oil price world, give the impact to the construction project. The cost for the construction also will increase because the price to buy the material and to pay the labour salary will increase too. If the situation is left and untreated, it will lead to more serious problems in the future upcoming construction project in Malaysia. Furthermore, if this problems continue, those were working in the construction industry will be facing numerous procedure and regulation before been awarded a construction project.

Although the contract parties agreed upon the extra time and cost associated with delay, in many cases there were problems between the owner and contractor as to whether the contractor was entitled to claim the extra cost. By

conducting this study, the project manager or event the public people can see on the cause and it effect and will avoid it in future.

1.2 Objective Of Study

- i. To identify the factors that contributes to the delay in government construction project.
- ii. To study the effect of delays in government construction project.

1.3 Scope Of Study

The scope of the study will cover the construction project in Kuantan. This study is needed to evaluate the level of understanding and applying these delay concepts in planning, design and field operation. The questionnaire will be distribute to the management team include site engineer, project manager, safety officer, supervisor and others.

1.4 Significant Of Research

This research was done for the purpose to fulfil several of significant which considered important to refer for the parties that will involve in construction especially the contractor. These significant involve:

- i. To study the factor that cause delay in construction project and produce the statistical result. The result of the study will be the guideline to the parties that involve, so that it will avoid any source that will happen in their project.
- ii. To suggest several factors that can avoid the delay in construction project. The factor can be study for the parties that involve in construction to reduce the risk of delay in construction project.
- iii. To study the effect of the delay in construction project. The result of the study will give good information to the involve parties to prepare fulltime work and responsibilities to ensure every activities will be done according to the plan.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Construction delays are delays in progress compared to the baseline construction schedule. Construction delays in residential and light construction are often the result of miscommunication between contractors, subcontractors, and property owners. These types of misunderstandings and unrealistic expectations are usually avoided through the use of detailed critical path schedules, which specify the work, and timetable to be used, but most importantly, the logical sequence of events which must occur for a project to be completed.

Refer to A.A. Aibinu et al (2002) delay is a situation when the contractor and the project owner jointly or severally contribute to the non-completion of the project within the agreed contract period. Delays in construction projects are frequently expensive, since there is usually a construction loan involved which charges interest, management staff dedicated to the project whose costs are time dependent, and ongoing inflation in wage and material prices.

According to Chabota et al (2008) delays on construction projects are a universal phenomenon and road construction projects are no exception. They

are usually accompanied by cost overruns. These have a debilitating effect on clients, contractors, and consultants in terms of, litigation, arbitration, cash-flow problems, and a general feeling of trepidation towards each other.

2.2 Types of Delays

The type of delay can also have an impact on non-critical activities which need a more detailed analysis to determine whether additional time extension is warranted, or if the reduction of float time can be justified. Excusable delays can be further classified into excusable with compensation and excusable without compensation. Terry Williams (2003) revealed that there are three basic ways to classify delays:

- i. Excusable delay with compensation
- ii. Excusable delay without compensation
- iii. Non-excusable delay

2.2.1 Excusable Delay with Compensation

Excusable with compensation are caused by the client's actions or inactions. When contractors encounter this type of delay, they are entitled to time extension as well as monetary compensation due to the delays. An example of an excusable delay with compensation would be when an owner denies access to the site once the notice to proceed is given.

This delay is because come sometime unexpected situation and it not from mistake of the contractor. The external factor is something hard to make sure because it refer to the future and event.

2.2.2 Excusable Delay without Compensation

Excusable without compensation are delays where neither the client nor the contractor is deemed responsible. When this type of delay is encountered, only a time extension will be warranted since there are no grounds for damages

This delay is allow to the extends of time to finish construction without give any compensation to the contractor. The factor that include of this delay is:

- i. Protest from the labour
- ii. Unexpected whether
- iii. Unexpected of late delivery equipment
- iv. Unexpected of late delivery material

2.2.3 Non-Excusable Delay

This delay cause by avoid the contract agreement by contractor and it was identify by construction contract. Client can claim their loss if had in the contract agreement. These delay had to identify by client because they rarely to check the schedule of the construction. The factor that contribute to the non-excusable delay:

- i. The usual weather and as expected whether
- ii. Delay cause by subcontractor
- iii. The inefficiency of contractor to manage the construction site.
- iv. The financial of contractor.
- v. The lack of labour.
- vi. Failure to manage their work according to the contract schedule.
- vii. Always make mistake or failure to fulfil of owner specification.

2.3 Factors that Affecting Delays Problem in Construction

Sadi A. et al (2006) identified 56 main causes of delay in Saudi large building construction projects and their relative importance. Based on the contractors surveyed the most important delay factors were: preparation and approval of shop drawings, delays in contractor's progress, payment by owners and design changes. From the view of the architects and engineers the cash problems during construction, the relationship between subcontractors and the slow decision making process of the owner were the main causes of delay. However, the owners agreed that the design errors, labour shortages and inadequate labour skills were important delay factors.

Daniel et al (1996) conducted a survey to determine and evaluate the relative importance of the significant factors causing delays in Hong Kong construction projects. They analyzed and ranked main reasons for delays and classified them into two groups the role of the parties in the local construction industry (clients, consultants or contractors) and the type of projects.

Adeyinka et al (1998) have addressed the causes of cost-time performance of public sector housing projects in Nigeria. They classified the causes of delay as project participants and extraneous factors. Client-related delays included variation in orders, slow decision-making and cash flow problems. Contractor-related delays identified were: financial difficulties, material management problems, planning and scheduling problems, inadequate site inspection, equipment management problems and shortage of manpower. Extraneous causes of delay identified were inclement weather, acts of nature, labour disputes and strikes.

Ayman (2000) carried out a quantitative analysis on construction delays in Jordan. The result of his study indicated that the main causes of delay in construction of public projects were related to designers, user changes, weather, site conditions, late deliveries, economic conditions and increase in quantity.

Similarly, M.Odeh et al (2002) also conducted a survey aimed at identifying the most important causes of delays in construction projects with traditional type of contracts from the viewpoint of construction contractors and consultants. Results of the survey indicated that contractors and consultants agreed that owner interference, inadequate contractor experience, financing and payments, labour productivity, slow decision making, improper planning, and subcontractors were among the top ten most important factors.

Frimpong et al (2003) conducted a survey to identify and evaluate the relative importance of significant factors contributing to delay and cost overruns in Ghana groundwater construction projects. A questionnaire with 26 factors was carefully designed from preliminary investigations conducted in groundwater drilling projects between 1970 and 1999 in Ghana. The questionnaire was directed towards three groups in both public and private organizations: owners of the groundwater projects, consulting offices, and contractors working in the groundwater works. The questionnaire was distributed to a random sample of 55 owners, 40 contractors and 30 consultants. The result of the study revealed the main causes of delay and cost overruns in construction of groundwater projects: monthly payment difficulties from agencies; poor contractor management, material procurement, poor technical performance, and escalation of material prices.

2.4 Identification of Factor and Group in Delays in Construction

The literature review was done through books, conference proceedings, the internet, and engineering journals. The group are includes the contractor, client, consultant, material, labour, equipment, external and financial.

2.4.1 Category of Contractor Related Delays

There are several studies by numerous researchers identified the factors of contractor related delays. Refer by Murali et al (2007) identified the improper planning contractor, poor site management and inadequate contractor experience problems with subcontractors contribute to causes of delays. N.K. Fong et al (2006) note that delay in interior finishes (tiles, painting, ceiling), delay in handover of plant room/plinth/water tank, improper electrical and mechanical coordination and management contribute to causes of delays. Essam (2006) identified the subcontracting problems, contractor is not well organized, contractor financial problems and bad quality of contractor's work contribute to causes of delays.

Sadi A. et al (2006) identified the conflicts in subcontractors schedule in execution of project, rework due to errors during construction, conflicts between contractor and other parties (consultant and owner), poor site management and supervision by contractor, poor communication and coordination by contractor with other parties, ineffective planning and scheduling of project by contractor, improper construction methods implemented by contractor, delays in subcontractors work, inadequate contractor's work, frequent change of subcontractors because of their inefficient work, poor qualification of the contractor technical staff, delay in site mobilization contribute to causes of delays.

Yaw et al (2003) note that planning and scheduling deficiencies, deficiencies in cost estimates prepared, waiting for information, mistakes during construction contribute to causes of delays. Abdalla et al (2002) identify the subcontractor, site management, construction method, improper planning and inadequate contractor experience contributes to causes of delays. G. Sweis et al (2007) identify the lack of contractor administrative personnel, shortage of technical professionals in the contractor organization, insufficient coordination

among the parties by the contractor, delay in mobilization, safety rules and regulations are not followed within the contractor's organization, incompetent technical staff assigned to the project, improper technical study by the contractor during the bidding stage, poor planning and scheduling of the project by the contractor, improper handling of the project progress by the contractor, ineffective quality control by the contractor, use of unacceptable construction techniques by the contractor, financial difficulties faced by the contractor, delay in contractor payments to subcontractors contribute to causes of delay.

There are a lot of factor that were get from previous study about the factor cause the delay in construction project. Most of the researchers agree that are the factor that always happen relate to the contractor:

- i. Inadequate contractor experience problems with subcontractors.
- ii. Ineffective planning and scheduling of project progress by contractor.
- iii. Mistakes during construction.
- iv. Delay in mobilization.
- v. Incompetent technical staff assigned to the project.
- vi. Poor site management and supervision by contractor.

By considering the case study refer in Kuantan, there are other factor that also important that causes the delays construction:

- i. Improper electrical and mechanical coordination and management.
- ii. Conflicts between contractor and other parties.
- iii. Delays in sub-contractors work.
- iv. Improper technical study by the contractor during the bidding stage.

2.4.2 Category of Client Related Delays

There are several studies by numerous researchers identified the factors of client related delays. According to Chabota et al (2008) identified the economic problems, contract modification contribute to causes of delays. Murali et al (2007) identified the owner interference, slow decision making, unrealistic contract duration and requirements imposed contribute to causes of delays. N.k. Fong et al (2006) identified the client type, lack of timely making decision, unrealistic imposed contract and client initiated variations contribute to causes of delays. Essam (2006) identified the change or variation orders, delay caused by owner, oral change orders by owner contribute to causes of delays.

Sadi A. et al (2006) identified the delays to furnish and deliver the site to the contractor by the owner, change orders by owner during construction owner, late in revising and approving design documents by owner, delay in approving shop drawings and sample materials, poor communication and coordination by owner and other parties, slowness in decision making process by owner, conflicts between joint-ownership of the project, unavailability of incentives for contractor for finishing ahead of schedule, suspension of work by owner contribute to causes of delays.

Abdalla et al (2002) note the owner interference, slow decision making by owner, unrealistic impose contract duration contribute to causes of delays. G. Sweis et al (2007) identified the delays in site preparation, delay in contractor's claims settlements, work suspension by the owner, too many change orders from owner, slow decision making from owner, inference by the owner in the construction operations, delay in progress payments by the owner.

There are a lot of factor that were get from previous study about the factor cause the delay in construction project. Most of the researchers agree that are the factor that always happen relate to the client:

- i. Inference by the owner in the construction operations change orders by owner during construction owner.
- ii. Poor communication and coordination by owner and other parties.
- iii. Slow decision making from owner.

By considering the case study refer in Kuantan, there are other factor that also important that causes the delays construction:

- i. Late to furnish and deliver the site to the contractor by owner.
- ii. Delay in contractor's claims settlements.
- iii. Suspension of work by owner.
- iv. Unavailability of incentives for contractor for finishing ahead of schedule.
- v. Late in revising and approving design documents by owner.

2.4.3 Category Of Material Related Delays

Several studies identified the factors of material related delays. According to Hyunjoo et al (2007) identify the material delivery were identified as factors to causes of delays in construction project. Murali et al (2006) identify the quality of material and shortage in material contributed the cause. P. A. Koushki et al (2004) revealed that the material selection duration contribute to causes of delays. G. Sweis et al (2007) identify the shortage of materials, delay in materials delivery contribute to causes of delays. A.A. Aibinu et al (2002) identify the material management problems that contribute to causes of delays.

Abdalla et al (2002) identify the poor quality of material and shortage having high influence to causes of delays. Murali et al (2007) identify the shortage in material and quality of material that contributes to causes of delays. Sadi A. et al (2005) identify the shortage of construction materials in market, changes in material types and specifications during construction, delay in material delivery, damage of sorted material while they are needed urgently, delay in manufacturing special building materials, late procurement of materials and late in selection of finishing materials due to availability of many types in market that contributes to causes of delays. G. Sweis et al (2007) identify the shortage of materials, delay in materials delivery, modifications in materials specifications that contribute to causes of delays.

There are a lot of factor that were get from previous study about the factor cause the delay in construction project. Most of the researchers agree that are the factor that always happen relate to the material:

- i. Shortage of construction materials in market.
- ii. Unpunctually material delivery.
- iii. Poor quality of material in construction.

By considering the case study refer in Kuantan, there are other factor that also important that causes the delays construction in Malaysia:

- i. Modifications in materials specifications.
- ii. Changes in material types and specifications during construction.
- iii. Identify the material management problems.

2.4.4 Category of Labour Related Delays

Group of labour related delays, one of the groups of causes identified earlier, was commonly cited in the literature that caused of delays. Several factors that related to labour can be distinguished and categorized under the principle cause. The methodology of establishing the factors of this group of causes was similar to that of the material related delays.

Several studies identified the factors of labour related delays. According to Murali et al (2006) identify the labour supply and labour productivity that contribute to causes of delays. Abdalla et al (2002) identify the labour supply and labour productivity that contributes to causes of delays. Yaw et al (2003) identify the labour shortages that contribute to causes of delays. Sadi A. et al (2006) identify the shortage of labours and low productivity level of labours that contribute to causes of delays. G. Sweis et al (2007) identify the shortage of manpower (skilled, semi-skilled, unskilled labour) and presence of unskilled labour that contribute to causes of delays.

There are a lot of factor that were get from previous study about the factor cause the delay in construction project. Most of the researchers agree that are the factor that always happen relate to the labour:

- i. Labour supply.
- ii. Labour productivity.

By considering the case study refer in Kuantan, there are other factor that also important that causes the delays construction:

- i. Shortage of manpower (skilled, semi-skilled and unskilled labour).
- ii. Presence of unskilled labour.