

**STRATEGIES FOR MANAGING DELAY IN MARA'S  
BUILDING CONSTRUCTION**

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**UNIVERSITI TEKNOLOGI MALAYSIA**

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## **ABSTRACT**

The study described in this paper covering delays and the importance of applying proper management in dealing with delays in construction particularly in MARA's building construction. The main objectives for this study were to determine the root causes of time delays in MARA's building construction, to assess the current weaknesses of managing delay and finally to establish strategies for managing delays in MARA's building construction. The data were gathered from responses from questionnaire survey and interviews with those involved in MARA's building construction project. This study highlights the importance of having more experienced and strong financial back up of contractors besides capable project managers and consultants to ensure the project completed within the stipulated duration .

## **ABSTRAK**

Kajian ini merangkumi kelewatan dan kepentingan menggunakan kaedah pengurusan yang betul semasa mengendalikan projek-projek MARA terutamanya yang mengalami kelewatan. Objektif utama kajian ini adalah untuk menentukan punca-punca kelewatan di dalam projek-projek MARA, menilai kelemahan cara pengurusan projek masa kini dan seterusnya mendapatkan strategi bagi mengatasi kelemahan/kelewatan dalam pelaksanaan projek tersebut. Data diperolehi daripada maklumbalas daripada pengurus projek (PMC) dan perunding yang terlibat dengan projek MARA di samping daripada kakitangan MARA sendiri secara kajiselidik dan temuduga. Kajian ini menekankan berhubung pentingnya melantik kontraktor yang mempunyai latar belakang kewangan yang kukuh di samping pengalaman luas dalam bidang pembinaan bangunan. Selain itu, pengurus projek (PMC) dan perunding yang dilantik juga perlu berkebolehan tinggi bagi memastikan projek dapat disiapkan dalam tempoh yang ditetapkan.

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 General Introduction**

The construction sector represents one of the most dynamic and complex industrial environments. Time is the essence of a construction contract. Typically, a time period is specified as the contract duration. The contractor is obliged under the contract to achieve substantial completion within the specific period. Unfortunately, unexpected events can happen during the life of the construction project and can affect the construction time necessary for the completion of the works. When a contractor fails to complete the project within the contract period, delay becomes the reality of the project.

The contractual remedy for the owner is to deduct liquidated damages. Obtaining an extension is the contractual release for the contractor against liquidated damages. Delays are generally categorized as excusable compensable, excusable non compensable and inexcusable. In such situations, contract law provides no mechanism for adjustment of the terms of the contract unless specific provisions are included in the contract.

In developing countries, the construction sector forms a high percentage of the economy. For instance, in Malaysia in the third quarter of 2004, the construction sector contracted by 3% compared to a positive growth of 2.4% in the same quarter a year ago. Up to the Asia – crisis average annual growth rate of 14% and demand for construction material increased by 37% in 2001 compared to 2000, budget 2001 allocates RM 24 billion for infrastructure projects. Meanwhile in the United

Kingdom the construction industry has averaged 7.5% of the gross domestic product over the 5 years between 1992 and 1996, employing around 1.4 million people in 1998. Despite its great economic importance, the construction industry regularly shows lower levels of productivity when compared with the manufacturing industry (Abdul-Rahman et al., 2006).

All parties involved in constructing a project must understand the sort of business they are in and should implement management well through the life of project (Harrison, 1995). Andersen et al. (1995) found that the standard planning approach can be replaced with milestone planning, which will focus and promote result-oriented thinking rather than activity-oriented thinking. This finding is consistent with Bart (1993) that the traditional approach of planning and controlling of projects tend to fail mainly because of too much formal control which curtails creativity from playing a crucial role in execution of the project.

In Malaysia, many speculations rises due to lot of government project being delayed in completion. Normally, the contractor will be blamed for the delay. As a result, post mortem to be carried out in order to seek the roots of the delay. Base on this find out, professionals (such as project manager, architect and engineers) need to be more serious especially during the design stage.

According to Abd El-Razek et al. (2008) discussed the role of consultancy in minimizing the delays of large projects and showed possible categorizations of causes of delay such as internal and external, financial and non financial.

When building project facing with delay, client will have to suspen/delay of occupying the building. For instant, most of the MARA's building institution projects like Maktab Rendah Sains MARA (MARA Junior and Science College @MRSM) which started to build in 8<sup>th</sup> Malaysia Plan delayed and continued to 9<sup>th</sup> Malaysia Plan. This delay has affected the student intake and the MARA's planning for the educational program.

## 1.2 Problem Statement

Majlis Amanah Rakyat (MARA) is an agency under Ministry of Rural and Regional Development has successfully managed to complete a lot of project and some projects still under construction. But unfortunately, most of completed and undergoing projects are facing with delay. A few projects has been terminated while some still under observation/consideration either to be terminated or may proceed with stringent conditions.

Looking to the selection of contractors during the tendering stage, some criterias had been established to ensure only capable contractors being selected. The criterias are capabilities of financial, duration of completion, quality of experiences, locality and current works in hand. All tenderers will be evaluated through these criterias for selection purpose. The selection will be conducted by the Board of Tender chaired by the Director General of MARA. Also attend during the selection meeting is representative of Jabatan Kerja Raya (JKR). But in certain cases, MARA will conduct negotiation with several contractors as a method to select the best contractors for the respective work.

Suspension means stoppage of work directed to the contractor by a formal form from the client, while delay is a slowing down of work without stopping it entirely (Bartholomew, 1998). Delays give rise to disruption of work and loss of productivity, late completion of project, increased time related costs, and third party claims and abandonment or termination of contract. It is important that general management keep track of project progress to reduce the possibility of delay occurrence or identify it at early stages. Construction planning has to be a much more decentralized activity to cope with the inherently uncertain nature of task duration.

Top management support is required and this can be defined as the willingness of the top management to provide necessary resources, authority and power. Decision making at the right time is important especially with a fast-track project in preventing delays because the concept of using fast-tracking can be applied to traditional contract projects whereby construction starts prior to completion of the



design/contract document. Decision making process is used as the key to effective project management especially in value and risk analysis.

An analysis is needed to identify the impact of delay on time and cost followed by taking the appropriate action to mitigate delay and minimize the cost required. Most of delays in MARA's project are due to lack of strategies to minimize this delay. It is important to improve the estimated activity duration according to the actual skill levels, unexpected events, efficiency of work time, mistakes and understanding. Mitigation efforts are necessary to minimize losses and this can be achieved by many procedures such as protection of uncompleted work, timely and reasonable procurement, and timely changing or cancellation of purchase order. Construction projects involve more variables and uncertainties than in the product line. This factor increases the probability of delay occurrence in construction projects and makes effective management important to reduce the diversions from the original program.

### **1.3 Aim and Objectives**

The aim of the study is to minimize delay in MARA's building project through suitable strategies that can be implemented by MARA's management .

The objectives of this research are as follows:

- i. To determine the root causes of delays in MARA's building construction.
- ii. To assess the implication of delays in MARA's building construction.
- iii. To establish strategies of managing delays in MARA's building construction.

## **1.4 Scope of Research**

This research was being carried out based on the data collected mainly through studies questionnaire survey exercise and interviews. The study focused on MARA completed projects which faced with the construction delay.

## **1.5 Project Methodology**

The methodology of the project consists of three phases as shown below (Table 1.1):

### **i) First Phase**

The researcher determined the objective of the research and also the scope of the research. Then gathered information from journals, books and internet for preparing literature review.

### **ii) Second Phase**

This phase was conducting questionnaire survey and interviews with staff of MARA, Project Management Consultant (PMC) and Consultant (Architect, C&S Engineer, M&E Engineer & Quantity Surveyor) involved with the MARA's completed and delayed projects. The projects were:

- a) Proposed construction of Maktab Rendah Sains MARA (MRSM) Bentong, Pahang Darul Makmur.
- b) Proposed construction of Maktab Rendah Sains MARA (MRSM) Pekan, Pahang Darul Makmur.
- c) Proposed upgrading of Maktab Rendah Sains MARA (MRSM) Kuantan, Pahang Darul Makmur.
- d) Proposed construction of Kolej Kemahiran Tinggi MARA (KKTM) Kuantan, Pahang Darul Makmur.

- e) Proposed upgrading of Institut Kemahiran MARA (IKM) TSYA, Pekan, Pahang Darul Makmur.
- f) Proposed upgrading of Kolej Profesional MARA (KPM), Kuantan, Pahang Darul Makmur.
- g) Proposed upgrading of Maktab Rendah Sains MARA (MARA) Kuala Berang, Terengganu Darul Iman.
- h) Proposed upgrading of Maktab Rendah Sains MARA (MRSM) Kuala Terengganu, Terengganu Darul Iman.
- i) Proposed construction of Kolej Kemahiran Tinggi MARA (KKTM) Kemaman, Terengganu Darul Iman.
- j) Proposed upgrading of Institut Kemahiran MARA (IKM) Besut, Terengganu Darul Iman.

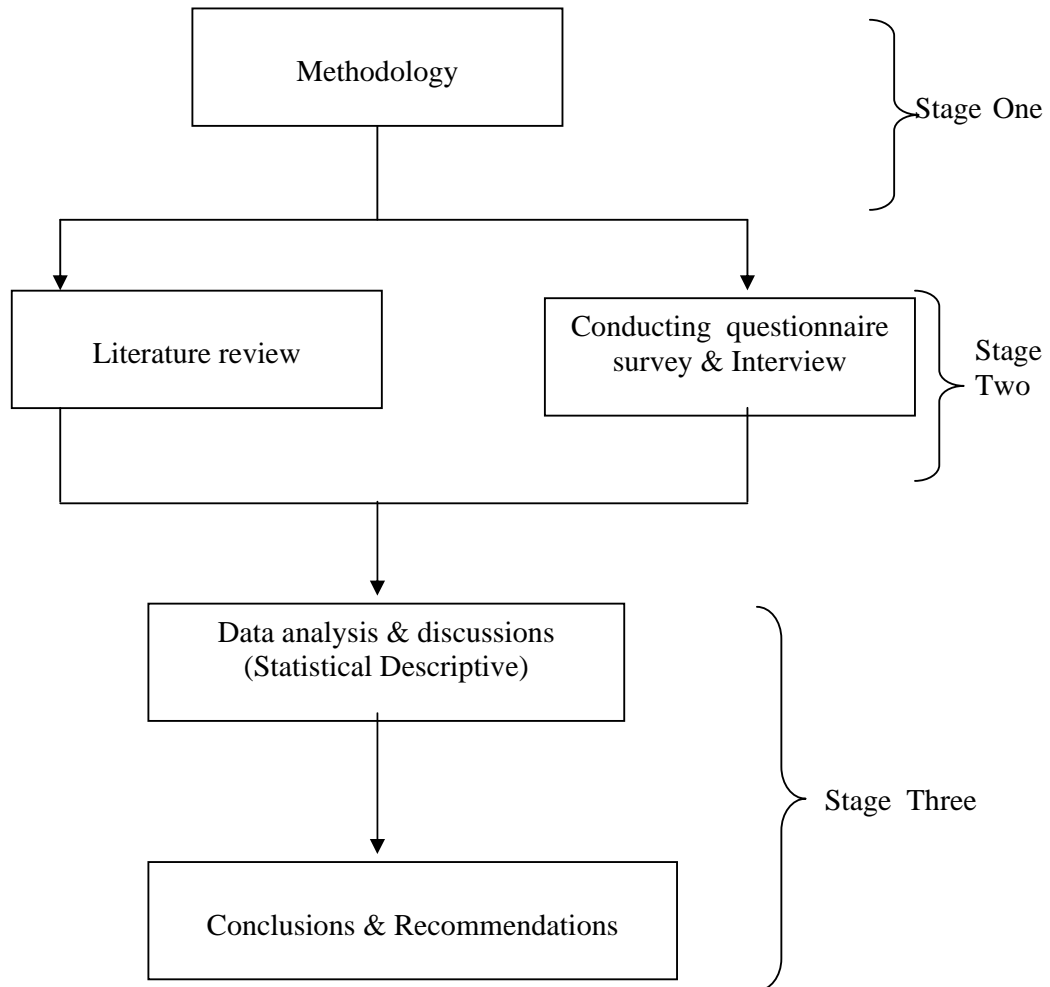
**iii) Third Phase**

The information collected by questionnaire survey and interviews had been analyzed by using descriptive statistic such as frequency and means. The result of survey was being reviewed and analyzed. Then, the next activity was developing/recommending strategies to mitigate the delay in MARA's building construction project.

The main objectives of this survey are:

- a) To determine management's responsibility and approaches used in minimizing the effect of delay in MARA's building project.
- b) To identify the types and causes of delays in MARA's building project.
- c) To obtain feedback on strategies/procedures used to overcome or mitigate the effect of delay incidents in MARA's building project.

The flow chart below describes the step of the research:



**Figure1.1: Flow Chart of Research Methodology**

## **1.6 Significance of Findings**

This study has identified the root causes of delays in MARA's building construction. It also assessed the implication of delays and finally established strategies that can be utilized by MARA's management for managing delays in project implementation.

## **1.7 Summary**

Through the study that had been carried out, the researcher should be able to find out information on how to mitigate the delay in MARA's building project. Through the data collected from questionnaire survey and interview, it will give better explanation to achieve the aim of study.

## REFERENCES

- Abd El-Razak, M.E., Bassioni, H.A. and Mobarak, A.M. (2008). Cause of Delay in Building Construction Projects in Egypt. *Journal of Construction Engineering & Management*. 134(11),831-841.
- Abdul-Rahman, H. and Berawi, M. A. (2001). “Developing knowledge management for construction contract management.” Proc., 14<sup>th</sup> Int. Conf. of Application Prolog-Knowledge Management and Decision Support (SOL)., University of Tokyo, 358-378.
- Abdul-Rahman, H., Berawi, M.A., Berawi, A.R., Mohamed, O., Othman, M. and Yahya, I.A. (2006). Delay Mitigation in the Malaysian Construction Industry. *Journal of Construction Engineering & Management*. 132(2),125-133.
- Alias, I. (2006). Faktor-faktor Kelewatan dalam Projek Pembinaan Bangunan Pendidikan MARA. *MSc Thesis* Universiti Teknologi Malaysia. Pages 1-84.
- Anderson, E. S., Grude, K. V. and Hang, T. (1995). *The goal directed project management*, 2<sup>nd</sup> Ed., Kogan Page, London.
- Bart, C. K. (1993). Controlling new product R. & D projects. *R & D Manage.*, 23, 187-197.
- Blacud, N.A., Bogus, S.M., Diekmann, J.E. and Molenaaride, K.R. (2009). Plan Documents Sensitivity of Construction Activities Under Design Uncertainty. *Journal of Construction Engineering & Management*. 121(3), 113-124.
- Bramble, B. B. and Callahan, M. T. (1992). *Construction delay claims*. 2<sup>nd</sup> Ed., Wiley, New York.
- Carnell, N. J. (2000). *Causation and delay in construction disputes*. Blackwell Science Ltd., Oxford, U. K.
- Clogh, R. R. (1981). *Construction contracting*. 4<sup>th</sup> Ed., Wiley, New York.
- Clough, R.H. (1975). *Construction contracting*. John Wiley and Sons, Inc.
- Goodman, L. J. and Ralph, L. N. (1980). *Project planning and management*. An integrated approach, Hawaii.

- Harrison, F. L. (1995). *Advanced project management*, 3<sup>rd</sup> Ed. , Gower. Aldershot.
- Kraiem, Z. M. and Diekmann, J. E. (1987). Concurrent Delay in Construction Projectst. *Journal of Construction Engineering & Management*.113(4),591-602.
- Lee, D. M. (1983). "Time impact analysis-Forensic scheduling." *Liability in Constr. Mgmt., proc., Symp. Of Constr. Div.*, ASCE, in conjunction with the ASCE Convention, Hoston, Tex., Otc. 17-21, 43-55.
- Lo, T. Y., Fung, I. W.H. and Karen C.F Tung (2006). Construction Delays in Hong Kong Civil Engineering Projects. *Journal of Construction Engineering & Management*.132(6), 636-649.
- Lock, D. (1996). *Project management*. 6<sup>th</sup> Ed., Gower, Aldershot.
- Motsa, C. D. (2006). Managing Contruction Diputes. MSc.Thesis Universiti Teknologi Malaysia. Pages 1-96.
- Naief, T. H. (2002). A comparative evaluation of construction and manufacturing material management. *Int. J. proj. Manage.*, 20, 263-267.
- O'Brien, J. J. (1976). Construction delay: Responsibilities, risk and litigation. Cahners Books International, Inc. Boston.
- Pickavance, K. (2000). Delay and disruption in construction contracts. 2<sup>nd</sup> Ed., LLP. London.
- Schaber, G. D. and Rohwer, C. D. (1984). *Contracts in a Nutshell*. West Publishing Co., St. Paul, Minn.
- Shi, J. J., Cheung, S.O. and Arditi, D. (2001). Construction Delay Computation Method. *Journal of Construction Engineering & Management*.127(1),60-65.
- Sundaram, T. K. (1989). *Contract management: A rational approach to construction contract pricing*. New Delhi.
- Zack, J. G. (2003). "Schedule delay analysis; is there agreement?" Proc., PMI-CPM College of Performance Spring Conf. [http://www.pmi-cpm.org/public/news\\_events/2003\\_spring\\_conf/index.html](http://www.pmi-cpm.org/public/news_events/2003_spring_conf/index.html), May 7-9, 2003, Project Management institute –College of Performance Management, New Orleans.