DEVELOPMENT OF COMMON WORK BREAKDOWN STRUCTURE (WBS) FOR SCHOOL PROJECT

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To my wife

Naziah bt. Yusoff

Thank you for your everlasting trust

To my sons and daughter

Ahmad Wildan, Ahmad Addeen, Ahmad Khaldun, Ahmad Uwais, Ainna Falihin

Abah will keep on trying to be the best father in the world.

To my self

Syukur Alham dulillah

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May Allah blessed you all.

ABSTRACT

A lot have been said about delayed school projects. Among the main factors that contribute to the problem are lacking of experience among the contractor, adopting non suitable and non detailed scheduling method for project monitoring. Ministry of Works and The Ministry of Education are two main bodies that offer school tender. They used two different methods of tendering procedure which come out with two different methods of project scheduling and monitoring.

Bear in mind that every scheduling technique has its own limitation. Proper preparation of scheduling however will help in avoiding delay of completion. This project explore the potential of Work Breakdown Structure (WBS) as a tool to enhance the current scheduling method. Focus is given only on school projects. Among the objectives of this project are to identified the normal steps in preparing WBS in the project scheduling and to develop a common Work Breakdown Structure specifically for school projects.

The methodology adopted involving literature search, interview with authorities, consultants and contractors who have experienced in school projects. Analysis based on the structured interview was used to identify the main reason for project delay. Result from the survey has shown that reasons for school delayed are no proper scheduling tools and lack of experience and bad site management. A newly developed common WBS for school project is also proposed and used by contractors in assisting them during the preparation of work scheduling on site.

ABSTRAK

Banyak yang telah diperkatakan mengenai projek sekolah di Malayisa. Antara factor utama yang di katakana menyumbang kepada masalah ini ialah kekurangan pengalaman di pihak kontraktor dan penggunaan teknik penjadualan yang tidak betul di tapak bina. Dua badan utaman yang menganugerahkan tender projek sekolah adalah Kementerian Pendidikan dan Kementerian Kerja Raya. Mereka menggunakan kaedah tender yang berbeza yang menghasilkan beberapa kaedah penjadualan tapak yang berbeza beza di kalangan kontraktor.

Perlu di ingatkan bahawa setiap teknik penjadualan mempunyai had mereka masing-masing. Penyediaan penjadualan yang betul dilihat boleh mengelakkan kelewatan melaksanakan kerja. Kajian ini meneroka potensi *Work Breakdown Structure (WBS)* sebagai satu alat untuk menambahbaikan kaedah penjagualan semasa. Tumpuan hanya akan diberi keatas projek sekolah. Antara objektif kajian ini adalah untuk mengenalpasti kaedah yang di gunakan untuk meyediakan *Work Breakdown Structure (WBS)* dalam penjadualan projek dan membangunkan satu *Work Breakdown Structure (WBS)* khusus untuk projek sekolah.

Metodologi kajian melibatkan kajian literatur dan temubual dengan pegawai kerajaan, perunding, dan kontraktor yang mempunyai pengalaman dalam projek sekolah. Analisa terhadap hasil temubual terancang dengan individu-individu berkenaan digunakan untuk mengenal pasti punca kelewatan dan tertangguh projek sekolah. Dalam kesimpulan kajian, masalah utama kontraktor dalam kelewatan untuk melaksanakan projek sekolah telah di kenalpasti. Punca utama nya '*Work Breakdown Structure'* yang umum untuk projek sekolah telah berjaya di bangunkan. Ianya boleh diguna pakai oleh kontraktor dalam penyediaan proses penjadualan kerja di tapak bina.

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CHAPTER 1

INTRODUCTION

1.1 Background

Construction industry is very unique and complex due to the involvement of many parties and consumption of varieties of resources. According to Ballard and Howell (1998) construction covers a spectrum ranging from slow, certain, and simple project to quick, uncertain and complex project. In addition, Koskela(1992) stated that construction is unique in the sense of it is one-of a kind nature of projects, site production and temporary multi-organization. However, failure of establishing a good management system in construction project will lead to many problems that would cause cost of project increases, late completion of project and low quality which finally reduce the profit of the contractor.

According to Hendrickson (1989) good scheduling can eliminate problems due to production bottlenecks, facilitate the timely procurement of necessary materials, and otherwise insure the completion of a project as soon as possible. In contrast, poor scheduling can result in considerable waste as laborers and equipment wait for the availability of needed resources or the completion of preceding tasks. Delays in the completion of an entire project due

to poor scheduling can also create havoc for owners who are eager to start using the constructed facilities.

Currently, projects in Malaysia were monitored using several types of project scheduling technique, where the most common approach is by using Gantt Chart, Line of Balance or Networking technique such as Arrow Diagram Method, Precedence Diagramming Method and Project Evaluation Review Technique (PERT). However, Hendricson (1989) stated that there are several limitations to these methods. These limitations has lead to a lot of problems as mentioned by Koskela (1992). Therefore this research work focused on project delay which is one of the contributing factor to project failure. However, only school project has been chosen for the case study of this research work.

1.2 Problem Statement

Malaysia experiences a high growth in construction that lasted more than one decade. In less than twenty years, Malaysia was crowned as having the most developed infrastructure in East Asian countries, from what was once a backward third world facility. Many success stories made it to the front page of world press but very little of the major flop in construction sector ever make it to the publics' knowledge. Malaysian has it fair share of project cost overruns, delays and uncompleted infrastructure development.

One only needs to pay more attention to realize that a large portion of the development was not completed as planned, especially in the less "public-aware" segment like government schools construction programs. In general, among the prime factor that contributes prominently to project cost overrun and delayed in project completion, is failure to continuously monitor the project timely and diligently. Issues of abandoned uncompleted school construction

project or worse, completed but unfit for occupation should be given more attention.

In Malaysia, the two relevant bodies that are responsible for handling out schools construction works are The Ministry of Works or commonly known as JKR and The Ministry of Education (MOE). While JKR utilizes the "Open Tendering" method, MOE uses the Design and Build (Turnkey) system. Although in this context the method of awarding the schools construction projects can not be argued as a predetermined outcome of the particular project, it is nevertheless undeniable that each of this mentioned method of awarding projects has their benefits and their weakness.

Delayed or sometimes, abandoned school projects were always related to poor site management, inexperienced contractors, poor mobilization of resources such as man power and machineries, poor communication among parties involved and most important of all is lack of knowledge in using the appropriate scheduling technique. Although there are several scheduling technique practiced by contractors, it seems that delays still occurs. Issues related to the limitation of current practice in scheduling, lack of having good and relevant Work Breakdown Structures in project schedule, consistency and coordination between the process in preparation of Bill of Quantities and project schedule must be given priority in order to minimized such cause. Often, these forgotten element is remembered only when the project is underway and required the missing element. In most cases, forgotten works has serious influence on the development schedule and delivery, and may impact the project cost severely. The WBS is one tool that if used correctly, helps everyone involved avoid such occurrence by ensuring that nothing significant has been forgotten.

1.3 Objectives

The aim of this study is to develop a common work breakdown structure (WBS) for school construction projects. This study will look into the current approach in preparing of WBS elements in school construction project. It will also investigate and analyzes the limitation of current scheduling method commonly used in school construction project.
The objectives of this study are as follows:

i. To analyse the work breakdown system in current school construction contract.
ii. To investigate the actual requirement in project breakdown and to facilitate the work process at site.
iii. To develop a common Work Breakdown Structure system for school construction project.

1.4 Scope and Limitation of the Study

The scopes and limitation of this study are as follows:

i. The focus of this study confine within the school construction projects only.

ii. Observation done on contract documents produced by the Ministry of Works and Ministry of Education, all related to school construction projects.

iii. Observation was also done on work program used by contractors for these school construction projects. Attention was focused on how the work is being divided on site and on how these normal

methods are used by contractors on guiding them in terms of project scheduling reports, managing resources and controlling budget.

iv. Structured interview with professionals, panels of expert, consultant and contractors within the industries. Findings from these interviews will be utilized to develop a common WBS that can be used to better guide, control and manage sub-contractors, contractors and the clients specifically for school construction projects.

1.5 Brief Methodology

The flow chart of research methodology for this study is shown in Figure 1.1

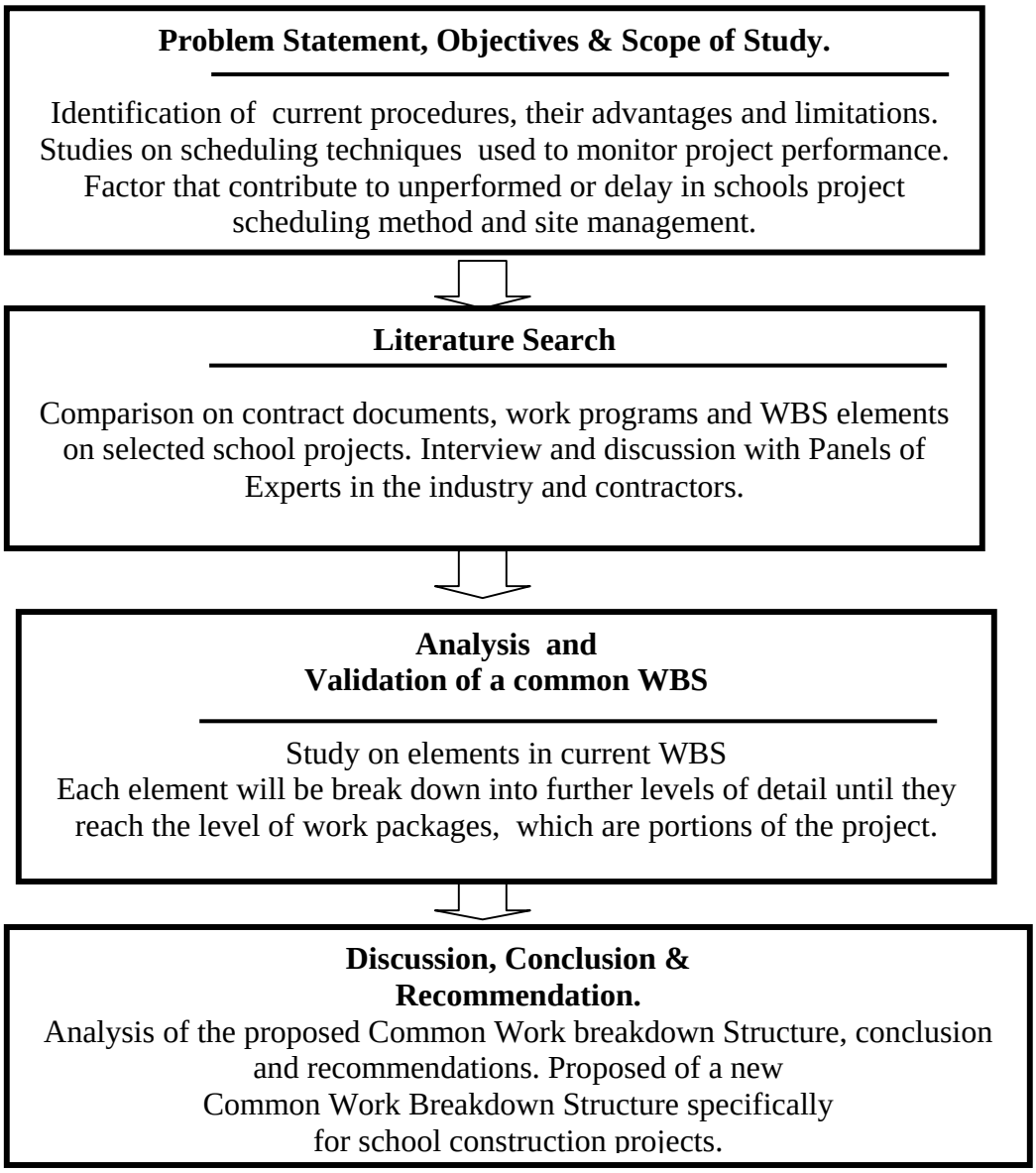

Figure 1.1 Brief Methodology

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