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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This project was never an individual effort, because in completing it, the author was assist with many good and supportive people. The author was in contact with many academicians from the University of Technology Malaysia and Mara University of Technology, practitioners, consultants and people who are involve directly or indirectly in the construction industry.

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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 Malaysia. 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 menghasilikan beberapa kaedah penjadualan tapak yang berbeza beza di kalangan kontraktor.


CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION</td>
<td></td>
<td>ii</td>
</tr>
<tr>
<td>DEDICATION</td>
<td></td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td></td>
<td>iv</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td></td>
<td>v - vi</td>
</tr>
<tr>
<td>CONTENTS</td>
<td></td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td></td>
<td>xii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td></td>
<td>xiv</td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td></td>
<td>xiii</td>
</tr>
</tbody>
</table>

CHAPTER 1  INTRODUCTION  1

1.1 Background  1
1.2 Problem Statement  2
1.3 Objectives  4
1.4 Scope and Limitation of the Study  4
1.5 Brief and Methodology  5
CHAPTER 2  LITERATURE REVIEW  7

2.1 Introduction 7
2.2 Malaysian School Projects 8
2.3 Method of Awarding Contract 9
  2.3.1 Traditional Design, Tender and Construct Contract 9
  2.3.2 Design and Build Contract 10
  2.3.3 Construction Management Contract 11
2.4 Main Contract Document 12
2.5 Project Planning and Scheduling for School Construction 13
  2.5.1 Project Scheduling 14
2.6 Types and choice of Scheduling Method 15
  2.6.1 Computer Application on Project Scheduling 15
  2.6.2 Microsoft Project (MSP) Software 16
  2.6.3 Primavera Project Planner (P3) Software 17
2.7 Basic Scheduling Technique 17
  2.7.1 Gantt Chart 18
  2.7.2 Arrow Diagram Method 21
  2.7.3 Precedence Diagramming Method 22
  2.7.4 Project Evaluation Review Technique (PERT) 23
  2.7.5 Line of Balance 24
2.8 Summary 25
CHAPTER 3 ROLE OF WORK BREAKDOWN STRUCTURE IN PROJECT MANAGEMENT 26

3.1 Introduction 26
3.2 Work Breakdown Structure 27
3.3 Level of Works Breakdown Structure 28
3.4 Application of Work Breakdown Structure 30
3.5 Purposes and Benefits of WBS 32
  3.5.1 WBS in Work Identification and Assignment 36
  3.5.2 WBS in Schedule Management 36
  3.5.3 WBS in Plans 37
  3.5.4 Status Reporting 37
  3.5.5 Cost Management 38
  3.5.6 Cost Estimating 38
  3.5.7 Budgeting and Cost Control 39
3.6 WBS as a Performance Management 41
3.7 Failure of Works Breakdown Structure 41
3.8 Summary 43

CHAPTER 4 METHODOLOGY OF THE STUDY 45

4.1 Introduction 45
4.2 Determination of the Research Objective 46
4.3 Case Study on School Projects 47
  4.3.1 Research Materials 47
  4.3.2 Development of Questionnaire for the
CHAPTER 5  DATA ANALYSIS AND DISCUSSION  
5.1 Introduction  
5.2 Effect of Registration Grade and Type of Documentation on the Completion of School Projects  
5.3 Lack of Experience Affecting School Projects Delay  
5.4 Effect of Work Programme on the Completion Of School Project  

CHAPTER 6  DEVELOPMENT OF WBS FORMAT AND GUIDELINES  
6.1 Introduction  
6.2 Preparation of WBS  
6.3 Proposed Format of WBS Presentation  
6.4 Guidelines for the Designing of WBS  
6.5 Criteria in Developing the WBS
6.6 Checklist for the Preparation of WBS 82
6.7 An Example of a WBS for a School Construction Project 84
   6.7.1 Project Brief 84
   6.7.2 WBS on Construction of Sample Project (School Building) 85

CHAPTER 7 CONCLUSION AND RECOMMENDATION 95

7.1 Introduction 95
7.2 Managing School Projects in the Future 96
7.3 Concept and Application of WBS in School Project Scheduling 96
7.4 Application of WBS in Construction Schedules for Selected School Projects 97
7.5 To Initiate/Propose Format and Guidelines for WBS 98
7.6 Example of WBS for a Building School Project 99
7.7 Conclusion 99
7.8 Recommendation 101

REFERENCES 102
APPENDIX I 104
APPENDIX II 105
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE NO.</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>A typical of six-level project WBS</td>
<td>29</td>
</tr>
<tr>
<td>3.2</td>
<td>Work Breakdown Structure Outline</td>
<td>31</td>
</tr>
<tr>
<td>5.1</td>
<td>The summary of CIDB Registration grade and Type of Contract documentation for delayed and non-delayed school projects.</td>
<td>56</td>
</tr>
<tr>
<td>5.2</td>
<td>Summary of the expert panels and contractors involved in the case study</td>
<td>58</td>
</tr>
<tr>
<td>5.3</td>
<td>Content Analysis – Summary of views from twenty respondent towards the causes of school project delay</td>
<td>56</td>
</tr>
<tr>
<td>5.4</td>
<td>Comparison of construction activities generated from Contract Document and Contract Sum Analysis</td>
<td>63</td>
</tr>
<tr>
<td>5.5</td>
<td>Comparison of construction activities based on WBS element in project schedule generated from contract document</td>
<td>66</td>
</tr>
<tr>
<td>6.1</td>
<td>Example of WBS for a school building project</td>
<td>85</td>
</tr>
</tbody>
</table>
LIST OF APPENDICES

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Detailed background of respondence</td>
<td>104</td>
</tr>
<tr>
<td>II</td>
<td>Questionnaires for the expert panels and contractors</td>
<td>105</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE NO.</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Brief Methodology</td>
<td>6</td>
</tr>
<tr>
<td>2.1</td>
<td>Contractual Relationship between every party involved under the traditional design, tender and construct contract</td>
<td>10</td>
</tr>
<tr>
<td>2.2</td>
<td>Contractual Relationship of all party involved under the Design and Build Type of contract</td>
<td>11</td>
</tr>
<tr>
<td>2.3</td>
<td>Contractual Relationship of all party involved under the Construction Management contract</td>
<td>12</td>
</tr>
<tr>
<td>2.4</td>
<td>Example of Gantt Chart</td>
<td>20</td>
</tr>
<tr>
<td>2.5</td>
<td>Example of Arrow Diagramming Method</td>
<td>21</td>
</tr>
<tr>
<td>2.6</td>
<td>Example of Precedence Diagramming Method</td>
<td>22</td>
</tr>
<tr>
<td>3.1</td>
<td>A typical work breakdown structure</td>
<td>30</td>
</tr>
<tr>
<td>3.2</td>
<td>An example of WBS</td>
<td>35</td>
</tr>
</tbody>
</table>
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
Problem Statement, Objectives & Scope of Study.

Identification of current procedures, their advantages and limitations. Studies on scheduling techniques used to monitor project performance. Factor that contribute to unperformed or delay in schools project scheduling method and site management.

Literature Search

Comparison on contract documents, work programs and WBS elements on selected school projects. Interview and discussion with Panels of Experts in the industry and contractors.

Analysis and Validation of a common WBS

Study on elements in current WBS. Each element will be break down into further levels of detail until they reach the level of work packages, which are portions of the project.

Discussion, Conclusion & Recommendation.


Figure 1.1 Brief Methodology
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