EVALUATION ON DESIGN – BUILD PROCUREMENT PROCESS IN CONSTRUCTION INDUSTRY IN MALAYSIA

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SUPERVISOR’S DECLARATION

I hereby declare that I have checked this thesis/project and in my opinion, this thesis/project is adequate in terms of scope and quality for the award of the Bachelor Degree of Civil Engineering

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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“In the name of Allah, the most gracious, the most compassionate”

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ABSTRAK

ABSTRACT

Design and Build (DB) delivery method is a united procurement approach where the selected builder will take sole responsibility for all aspects and activities of the project. This method also defined as a system where the clients directly pledge with the contractor to construct the project and play a decisive role to design and construct the project. However, DB can be organized by two ways which are; clients hire a competent design and build contractor in a same company or clients will hire an external consultant to assists the contractor during design and planning phase to ensure the smoothness performance of the project. For this study, the project sample selected is a construction projects in Malaysia that implementing DB method. The purpose of this study is to identify existing problems or issues in DB construction project in Malaysia, propose resolution to handle and manage major issues presence and also suggesting solutions to better improve overall performance of Design - Build project. In order to identify all the problems and evaluate proper solutions to mitigate problems, this study implementing quantitative method. For quantitative method, questionnaire forms are handed out during data collection session to the respondents. To analyze and generate the collected data, Content Analysis and Average Index Analysis are being utilized. From the assembled results, it can be conclude that, most of the respondents agreed that their project deal with inexperience workforce problem. This problem occur may due to the inefficient or improper work planning. Insufficient or improper work planning can be improved by establishing a well - planned master program that are practical and implemented on site. Finally, this study propose a Standard Operating Procedure (SOP) that will act as a guideline to construction teams in order to better improve the overall performance of DB project and reduce major problems.
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LIST OF SYMBOLS

Ai  Constant expressing weight given to i
Xi  Variable that expressing the frequency of degree
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<tr>
<td>DB</td>
<td>Design – Build</td>
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<tr>
<td>DBB</td>
<td>Design – Bid – Build</td>
</tr>
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<td>CM</td>
<td>Construction Management</td>
</tr>
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<td>CMR</td>
<td>Construction Management at Risk</td>
</tr>
<tr>
<td>CMA</td>
<td>Construction Management as Agent</td>
</tr>
<tr>
<td>RFP</td>
<td>Request for Proposal</td>
</tr>
<tr>
<td>RFQ</td>
<td>Request for Qualification</td>
</tr>
<tr>
<td>PPP</td>
<td>Public – Private Partnership</td>
</tr>
<tr>
<td>GMP</td>
<td>Guaranteed Maximum Price</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>AI</td>
<td>Average Index</td>
</tr>
<tr>
<td>CPM</td>
<td>Critical Path Method</td>
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<td>NCR</td>
<td>Non Conformance Report</td>
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CHAPTER 1

INTRODUCTION

1.1 Introduction

Construction Industry is one of the cannonading industries of today that greatly affects the economy of any country. Construction is an imperative segment that contributes enormously in the financial development of a nation. The Construction Industry is a speculation drove segment where government indicates high intrigue. Government contracts with Construction Industry to develop infrastructure related to health, transport as well as education sector. For prosperity of any nation, Construction Industry is quintessential.

The construction industry is viewed as one of the main contributors towards a nation's economy. In Malaysia, the construction industry contributes significantly to the financial development of the nation. In the course of the most recent 20 years, the industry has reliably contributed approximately three to five per cent to the national GDP (Yong & Mustaffa, 2012). To enhance to the growth of the construction industry, (Yong & Mustaffa, 2012) mentioned that an estimated RM 138 billion has been provided for this industry by the Ministry of Works under the Tenth Malaysia Plan (2011-2015). The results of development play an important role towards the production of value way of life among the local population. To put it plainly, every one of us are directly or indirectly influenced by construction procedures and its final results.

In order to increase and boost the growth of construction industry, selecting the right delivery method for procurement is one of the essentials criteria that need to be implemented. Proper delivery methods needed responsibilities, contractual correlations and roles from related organisations in construction projects. Plus, this process usually
takes place when design is completed and constructed to the clients. The project delivery system also can be distinguished based on how the contract is being made between the owners with builders and designers (Touran et al. 2011).

A project delivery system has been defined as the set of relationships, roles and responsibilities of project team members and the sequence of activities required for the organization of a capital project. In the previous study, (Gransberg, Asce, Molenaar, & Asce, 2004) mentioned that project delivery can be viewed as a three-legged stool, with the legs being defined as cost, schedule, and quality.

Procurement method’s selections act as important role to ensure the projects are followed the objectives which are, time, cost and quality (Yong and Mustaffa, 2012). —Procurement method is a term that is quite broad in scope because this method needed to acquire several organizations work together to design, build and manage construction projects (Norziatul Husna, 2012). Plus, the presence of procurement also involve on handling and managing people or workers to meet all the requirements by the owners. (Rosli Abdul Rashid, 2006).

There are numerous project delivery methods that owners use on projects such as Traditional Design-Bid-Build, Design-Build, Construction Management and Construction Management at Risk. (El-sayegh, n.d.) has discovered that one of the vital explanations behind the poor performance of construction industry is the unseemliness of the type of delivery system that has been picked. Therefore, selection of any of the delivery systems to utilize may rely upon how well the project could perform under every system.

Procurement method’s selections act as important role to ensure the projects are followed the objectives which are, time, cost and quality (Yong and Mustaffa, 2012). —Procurement method is a term that is quite broad in scope because this method needed to acquire several organizations work together to design, build and manage construction projects (Norziatul Husna, 2012). Plus, the presence of procurement also involve on handling and managing people or workers to meet all the requirements by the owners. (Rosli Abdul Rashid, 2006).
Hence, to ensure the effectiveness of the procurement methods, there are two procurement methods that are categorized as most common and predominant project delivery system used in many countries namely as design – bid – build (DBB) and design – build (DB) (Miller et al., 2000; Al Khalil, 2002; Arditii and Lee, 2003; Ling and Kerh, 2004). This method already implemented and documented in 1968 at United States (Plebankiewicz & Zima, 2012). In Malaysia, DB method being introduced and launched by Prime Minister in 1983 in Public Works Department for constructing Kuala Terengganu Hospital which was completed in 1985 (Mokhtar, 1993).

1.2 Background of the Study

Procurement method is a process in a construction industry where all activities that related to construction project including providing materials, services and consultancy that may crucial to the project so that all the client’s requirements and needs can be accomplished (Martins, 2009; Sears et al., 2008). This method already being implemented not only these recent years, but actually, already done way back before. Back to early years, application of procurement method already implemented as early as 3,000BC. In Egypt, scribes responsible to design the pyramid and used papyrus to record the materials prices that are needed for the pyramid’s construction. Scribes also responsible as a clerk to observes and calculate all the expenditure for the materials and workforce for the construction. Plus, Ancient Roman also hired scribes as their clerks to make contract during trade – in activity with private suppliers. Besides that, at Great Britain, they are also applying this method back to William the Conqueror, where he wants to ensure the effectiveness way to record the tax transactions. Starts from that occurrence, procurement method starts to widening and influencing all construction projects.

Due to the rapid growth for the construction industries back then, the evolution of procurement system also evolve to a more systematically arrangement. Moreover, this system always changes from time to time to ensure the quality of the project. At first, the procurement method combined the design, maintenance, construction and operation into one, such as Design – Build – Operate (DBO) and Design – Build – Finance – Operate (known as Build – Operate – Transfer). Recently, this combined method already separated into two main categories, which are Design – Bid– Build (DBB) and
REFERENCES


Meghana, R., Manikandaprabhu, S., & Potti, S. R. (2016). Quality Assessment for DesignBid-Build Projects, (Figure 1), 5724–5729. https://doi.org/10.15680/IJIRSET.2016.0504086


Nurhajar, Abd Rahman (2009) A survey on problem faced by contractors using design and build contract. Faculty of Civil Engineering & Earth Recources, University Malaysia Pahang


S. M. El-Sayegh, —Significant Factors Affecting the Selection of the Appropriate Project Delivery Method, Fifth LACCEI International Latin American and Caribbean Conference for Engineering and Technology (LACCEI’2007), Tampico, México, 2007


Case Study of Construction Project Delivery Types; William J. Bender; 2007; PhD, PE, M.ASCE; Construction Management Professor, IET Department, 400 East 8th Avenue, Ellensburg


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Hong Xiao and David Proverbs (2002), The Performance of Contractors in Japan, the UK and
the USA-An Evaluation of Construction Quality, International Journal for Quality and
Reliability Management, Vol. 19 No. 6, pp. 672-687

Frank Harris and McCaffer, R. (2001), Modern Construction Managementl 5th edition,
Blackwell Science Inc

Best R. and Gerard De Valence (1999), Building in value Pre-Design Issues, Arnold
Publishers, pp. 36 – 46

General Contractors of Americas.

Contracting Methods to Accelerate Project Completion*, NCHRP Synthesis 379, Transportation
Research Board, Washington, D.C.

Martinez, P.H., Rashida, Y. and MacMurray V. (2007) —Construction Manager's
Responsibilities: Pre-Design, Design and Pre-Construction Phasel American Bar Association
January, 58pp.

Reviews*, NCHRPProject 20-07, Task 124, TRB, Washington, D.C.

Construction Business Owner, February

Marks, D. F. & Yardley, L. (2004). Qualitative data collection: interviews and focus groups. In
*Research methods for clinical and health psychology* (pp. 39-55). : SAGE Publications Ltd doi:
10.4135/9781849209793.n3


