SELECTION OF CONTRACTOR USING ANALYTICAL HIERARCHY PROCESS (AHP)

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SUPERVISOR'S DECLARATION

I hereby declare I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the award of Bachelor 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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Thesis submitted in fulfillment of the requirements
for the award of the
Bachelor Degree in Civil Engineering

Faculty of Civil Engineering and Earth Resources

UNIVERSITI MALAYSIA PAHANG

JUNE 2018

ACKNOWLEDGEMENTS

First of all, Alhamdulillah I am grateful because through patience, time and the knowledge that I have gain to complete my research. I also would like to take the chances to thanks my supervisor, Mr. Noram Irwan Bin Ramli for his valuable guidance, advises and his time throughout the entire research. Therefore, I was being able to complete my research on time.

I would like to express my appreciation and thanks to all my family members especially my parents for all their support throughout the work. I am also grateful to my friends for their valuable advice and opinion. A lot of thanks also to staff and people that involve in Universiti Malaysia Pahang (UMP) Campus Gambang for providing adequate facilities in supporting relevant literature.

My thanks also to people who have been involved in this research by helping me in my presentation through the research.

Moreover, thanks again to my family for being supportive and encouraging throughout my research. Thanks you very much.

ABSTRAK

Projek-projek pembinaan sedang berjalan pesat di Malaysia dan telah menjadi salah satu faktor penting dalam menyumbang peningkatan ekonomi negara. Kerana itu, pemilihan kontraktor merupakan aspek penting dalam sektor pembinaan terutamanya bagi klien atau pihak yang melibatkan keperluan untuk mengupah kontraktor terbaik untuk mengurus dan menyelesaikan projek mereka dalam masa dan kos yang diberikan juga dengan kualiti yang baik. Selain itu, tanpa menggunakan kaedah yang sesuai dalam pemilihan kontraktor, ia pasti akan menjejaskan penyelesaian keseluruhan projek. Dalam kajian ini, saya melakukan penyelidikan mengenai penggunaan proses hierarki analisis (AHP) sebagai model sokongan keputusan untuk memilih kontraktor. AHP membolehkan keputusan membina sebagai hierarki dan setiap kriteria boleh dinilai dengan skala keutamaan (dari 1 hingga 9) yang ditentukan oleh pakar dalam bidang pembinaan. Tujuan kajian ini adalah untuk mengenal pasti kriteria utama yang digunakan oleh pelanggan dalam pemilihan kontraktor juga menentukan kriteria pemberat dengan menggunakan kaedah AHP dari amalan semasa di Malaysia. Selain itu, kaedah ini adalah salah satu kaedah yang perlu untuk mengurangkan risiko kegagalan projek disebabkan prestasi kontraktor yang lemah.

ABSTRACT

Construction projects are now progressing rapidly in Malaysia and have been as one of an important factor in contributing increasing economic country. Because of that, contractor selection is an important aspect in construction sector especially for client or parties involve that need to hire the best contractor to manage and complete their project within time and cost given also with good quality. Furthermore, without a suitable method use in selection of contractor, it for sure will affect the completion of whole project. In this study, I am doing research about the use of the analytical hierarchy process (AHP) as a decision support model to select contractor. The AHP allows constructing decision as hierarchies and each criterion can be evaluated through weighted determined by the expert in construction field. The purpose of this study is to develop the main criteria used by client in selection of contractors also identify the weighted criteria by using AHP method from current practice in Malaysia. Besides, this method is one of the decision-making that is necessary to eliminate the risks of project failure due to poor contractor's performance.

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LIST OF SYMBOLS

AHP	Analytical Hierarchy Process
MOF	Garis Panduan Penilaian Tender (Kementerian Kewangan Malaysia)
CIDB	Construction Industry Development Board
W	Weighted
CI	Consistency Index
RI	Random Index
CR	Consistency Ratio
GMM	Geometric Mean Method

CHAPTER 1

INTRODUCTION

1.1 Introduction

In the midst of the globalization era we can see that the construction sector is very important to meeting the current modernization of Malaysia. Where the construction sector is one of the most important factors contributing to the country's economic growth of infrastructure, building and becoming a developed nation. Standing strong skyscrapers, high-rise buildings in Malaysia can be concluded that Malaysia is on track to make the country a developed nation in southeastern Asia and is respected. The increase in contribution to buildings will lead the growth of investment in our country but behind the successful and complete project depends on parties that involved managing, controlling the flow and management of project in adequate manner with respective specification. This matter is evidenced by the statistics of the gross production rate released by The Office of Chief Statistician Malaysia Department of Statistics, Malaysia on 10 July 2017 this year. The compound annual growth rates stated that the gross output in construction sector has grown from 14.3 per cents to rm177.9 billion in 2015 as compared to rm91.3 billion in 2010.

For the performance of the construction sector through statistics on Economic Census of Construction Sector conducted in 2016 for reference year 2015 state that a total of 40,558 establishments were involved in this census with compound annual growth rate of 12.9 per cents as compared to 22,140 establishments of 2010. The positive growth is recorded for the overall performance of the construction sector in 2015 that give a good impact on economic Malaysia.

From the performance that are stated above can we conclude that from civil engineering sector, the need to manage information systematically, efficiently are very

important because competition now very high. As recommended by the minister of work, Dato' Seri Samy Vellu said:

"Whether we like it or not, we have to go global. Going global is a necessity and not a choice anymore if we want our construction industry to grow in the next millennium. "

Cost, time, quality and safety are the main element in construction where the contractors need to take it as the important thing during delivery the project given. So, the best example of choosing a contractor is that they concerned with the elements mentioned during the construction. Failure to select a competent contractor properly can lead to problems for the entire project. Selecting the best criteria for contractors by Multi-criteria decision making (MCDM) techniques where used Analytical Hierarchy Process (AHP) method. AHP allows decision to be constructed as hierarchies and each criterion can be assigned to a preference scale that is determined by the decision makers. AHP is a form that comparisons are made by priority-ranking model which the success factors identified in sequential manner, criteria with the highest score is deemed the best.

In Malaysia, this kind of ranking model is important because without a suitable and precise method in selection of contractors, it will affect the completion of project. It becomes quite popular for using AHP-based approach due to its simple and systematic implementations steps. Whatever the selection method is, the significance of three criteria which is time, cost and quality should be considered.

1.2 Problem Statement

The decline in the construction industry occurred around 2005 to 2006 with a rate of negative 5.1%. There was a reduction in the number of projects and many bankrupts' contractors *(CIDB News, 2005).* In Malaysia, issues faced for selection of contractor where they do not emphasizing an important aspect in the delivery of construction projects where it linked to project success, in term of time schedule, cost, and quality. Besides, the overall project quality and owner satisfaction is relevant to the contractor performing the work. Contractor need to understand the procedures for obtaining government, private projects or tenders. Many of them are blacklisted because they cannot afford financial risk and responsibility given to complete the projects, also demand in price from chosen contractors when come from closed tender.

From observation, it is found that the contractors with insufficient financing where most of them do not have sufficient capital to finance their undertakings. Then, lack of experience and skills in technical or through management in construction phase which contractor unable to complete the project given according to agreed costs and time scheduled. Also, their quality performance for previous project that give them positive or negative impact. However, this study will identify the best criteria or factors that are important during selection of contractors using Analytical Hierarchy Process (AHP) where a theory of measurement through pair wise comparisons and relies on the judgments of experts to derive priority scales was applied.

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