IMPROVEMENT MEASURES OF COST OVERRUNS IN RESIDENTIAL CONSTRUCTION PROJECT IN MALAYSIA

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ABSTRACT

Cost overrun is the major issue in residential construction project industry worldwide, including Malaysia. These studies therefore aim to achieve three objectives namely: (1) to identify the existing practice for cost control in residential construction project; (2) to investigate the causes of cost overrun in residential construction project in Malaysia; (3) to propose improvement measures on cost overrun in residential construction project in Malaysia. This study was done via of literature review, questionnaire survey and expert focus group for data validation. This study found that: (1) the existing practice shows that the project management team for cost control in residential construction project in Malaysia are the moderate implementation of proper tendering system and bidding process, weak tender committee enforcement on the cost comparison for every contract awarded in a project and no submission of the project cost report to management throughout the project; (2) the cost overrun in residential construction project was causes by improper planning and scheduling, inconsistency in material's price, incompetent contractor, and poor financial capabilities by contractor; (3) the improvement measures of the cost overrun in residential construction project in Malaysia of which include effective project planning and scheduling, having competent project management teams and using cost-saving construction method in the project. This study could serve as a guideline to the project management team, which involves in Malaysia residential construction project to maximise the cost performance in the project and thus shall support the Construction Industry Transformation Programme Malaysia's national agenda.

Keywords: Causes of Cost Overrun, Cost Control, Improvement Measures, Residential Construction Project, Malaysia

ABSTRAK

Penambahbaikan kos adalah isu utama dalam industri pembinaan kediaman di seluruh dunia, termasuk Malaysia. Oleh itu, kajian-kajian ini bertujuan mencapai tiga objektif iaitu: (1) untuk mengenal pasti amalan sedia ada bagi kawalan kos dalam projek pembinaan kediaman; (2) untuk menyiasat sebab-sebab kos ditenggelami projek pembinaan kediaman di Malaysia; (3) untuk mencadangkan langkah-langkah penambahbaikan terhadap kos yang terkandung dalam projek pembinaan kediaman di Malaysia. Kajian ini dilakukan melalui tinjauan literatur, soal selidik kuesioner dan kumpulan tumpuan pakar untuk pengesahan data. Kajian ini mendapati bahawa: (1) amalan yang sedia ada menunjukkan bahawa pasukan pengurusan projek untuk mengawal kos dalam projek pembinaan kediaman di Malaysia adalah pelaksanaan sederhana sistem tender dan proses tender yang sederhana, penguatkuasaan jawatankuasa tender lemah terhadap perbandingan kos bagi setiap kontrak yang dianugerahkan dalam projek dan tidak mengemukakan laporan kos projek kepada pengurusan sepanjang projek; (2) kos yang dibelanjakan dalam projek pembinaan kediaman adalah disebabkan oleh perancangan dan penjadualan yang tidak betul, tidak konsisten harga bahan, kontraktor yang tidak cekap, dan keupayaan kewangan yang lemah oleh kontraktor; (3) langkah-langkah penambahbaikan kos yang ditanggung dalam projek pembinaan kediaman di Malaysia termasuk perancangan dan penjadualan projek yang berkesan, mempunyai pasukan pengurusan projek yang cekap dan menggunakan kaedah pembinaan penjimatan kos dalam projek. Kajian ini boleh menjadi panduan kepada pasukan pengurusan projek, yang melibatkan projek pembinaan kediaman Malaysia untuk memaksimumkan prestasi kos dalam projek dan dengan itu akan menyokong Program Transformasi Industri Pembinaan Malaysia agenda nasional.

Kata kunci: Punca Kos Habis, Kawalan Kos, Langkah Penambahbaikan, Projek Pembinaan Kediaman, Malaysia

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BIM	-	Building Information Model
CPM	-	Critical Path Method
EVM	-	Earned Value Management
EAC	-	Estimate at completion
CPI	-	Cost performance index
SPI	-	Schedule Performance Index
RII	-	Relative performance index
EFG	-	Expert focus group
CITP	-	Construction industry transformation programme

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CHAPTER 1

INTRODUCTION

1.1   Introduction

Construction industry plays very important role in any country's development. It is also creating employment both directly and indirectly and improves citizen's quality of life through the provision of essential socioeconomic infrastructure and public facilities. It is found that as of third quarter of 2019, Malaysia's economic growth was not led by construction sector anymore and merely contributes around 0.5 percent from the overall gross domestic product (GDP) from the construction activities involving residential building, infrastructure and non-residential buildings (Department of Statistic Malaysia, 2019).

Malaysia is in the process of vigorous development. It has been highlighted that since the 1970s, Malaysia's economic has undergone a rapid growth (Sripraset *et al*, 2010). Similar to other industries that contribute to the nation economic growth, cost in construction project is undeniably a very important factor to consider in a construction project life cycle. Therefore, project cost can is one of the most important parameters that drives towards the project's success (Azhar et al, 2008).

A construction project might require more than one person to manage the project together, depending on the project complexity. It is based on the type of project that shall determine the complexity of managing the cost of the construction project. Ineffective cost performance is a major issue in construction industry (Sriprasert *et al*, 2010), where cost spend exceeds budget, improper estimation, and construction cost under estimation are commonly occurred. Construction cost overrun shall cause in investment pressure and affects the decision making in the

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project. Normally, cost estimation will be planned in the preliminary stage to easier contractor to forecast the budget for a construction project.

1.2   Statement of Problem

Cost overrun happened when the project management team is lack of cost control plan in their project. Ineffective cost performance is a significant issue in the construction industry, where cost spend exceeds budget, improper estimation, and construction cost underestimation are commonly occurred (Ade *et al.,* 2012). Poor site supervision and management amongst all can contribute to cost overrun in the construction project. A lot of construction project has a poor management, such as non-skillful and inexperience human resource in site management also reflected this weakness as well as the incompetency of contractors (Ali *et al.,* 2010). Hence, it is essential to improve these existing practices in all of the construction project and cost-effectiveness.

In Malaysia, the phenomena of cost overrun in the residential construction project in the country remained unsolved, thus it is now lead to the abandonment of the project. The critical causes that lead to cost overrun are believed happened because of the incompetent project management team that manages the project. On the other hand, the contractor blamed on the developer because of the delayed progress payment and inconsistency of the design that hinder them from running the residential construction project smoothly, thus leading to the cost overrun problem and hence abandonment of the project (Hamzah *et al.,* 2016).

Since early 1980s, the construction industry experience cost overrun difficulties that always lead to the abandonment of the project. For instance, there were 74 cases of abandoned residential construction project in peninsular Malaysia (excluding Sabah and Sarawak) in 2016 (KPKT Statistic, 2016) and 67 cases of abandoned residential project comprising of 14,973 of residential units and 10,602 buyers (KPKT Statistic, 2017). Even though the statistic is slowly reducing, it still needs to be improved to ensure reducing trend in housing project abandonment in

Malaysia. Hence, the proper improvement measure has to be identified and implemented in all of the residential construction project in Malaysia to ensure the cost efficiency can be achieved.

There are several initiatives plan by government to remedy these problems due to the increasing number of abandoned residential construction projects. This include rehabilitating (reviving) of the current abandoned residential construction project, changing the existing selling plan to build and sell concept and encouraging project delivery success through some approaches such as public-private partnership (PPP) (Hamzah *et al.*, 2016). Hence, it is important to prevent cost overrun in the residential construction project to ensure lesser abandoned project in the future.

Therefore, this study emerges to appraise the cost overrun in the residential construction project in Malaysia via the objectives of investigating the existing practice for cost control, identifying the critical causes of cost overrun and proposing good improvement measures in better managing cost overruns in residential construction projects in Malaysia.

1.3   Research Objective

This study was aimed to appraise the improvement measures of cost overrun in a residential construction project in Malaysia. To achieve these aims, the following objectives have been identified:

(i)   To identify the existing practice for cost control in a residential construction project in Malaysia;

(ii)   To investigate the cause of cost overruns in a residential construction project in Malaysia; and

(iii)   To propose improvement measures on the cost overrun in a residential construction project in Malaysia.

1.4 Research Question

The following research question are intended to be answered by this study:

a)   What is the cost control method for cost overruns in residential construction project in Malaysia?

b)   What are the causes of cost overruns in residential construction project in Malaysia?

c)   How to improve the cost overrun in residential construction project in Malaysia?

1.5 Conceptual Framework

The framework process developed by Kunal Mohan & Ahlemann (2012) for project management is suitable to be used in this study. They have split up the framework into three main phases: Exploration, Research Design and Research Execution as shown in Figure 1.
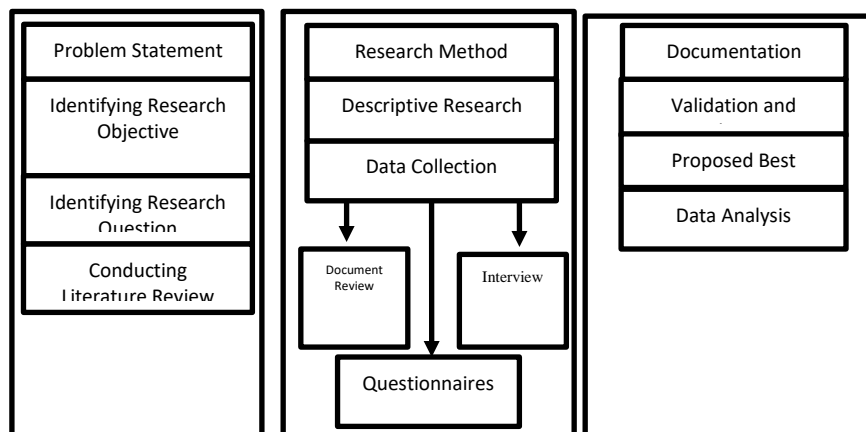

Figure 1.1   Conceptual framework (Kunal *et al*, 2012)

Therefore, this conceptual framework will be used as a guideline for this study.

1.6 Significance of the study

Basically, this study is expected to provide the answer or result for some of the irregular issues such as cost overrun that exist in Malaysia's construction industry focussing in the residential construction project. These issues arise due to the parties who are unclear and not alert on the causes of cost overrun in Malaysia. Thus, by investigating the potential problem of cost overrun in residential construction project, the result will be the guideline to the project management team in Malaysia.

To achieve good cost efficiency in a project and avoid the cost overrun can be accomplish by proper planning and scheduling in the preliminary stage in the project. It has to be complete without compromising the quality, material and the timing of the project. In addition to that, the study will provide the best practice on how to improve cost overrun in residential construction project, which can be as a basic guidance for those who are involved in construction industry, for instance, the developers, consultants, the contractor and other related profession. Finally, it will improve the better understanding of managing cost overrun in residential construction project in Malaysia.

1.7 Scope and limitation of Research

The scope of this study is mainly focused on the existing practice of cost control, the causes of cost overrun and the improvement measures of cost overrun in residential construction project in Malaysia.

As this study shall adopt a thorough literature review, the questionnaire survey, and the expert focus group interview. The respondents for this research involve developer, consultants, and contractor of the construction company of G1 to G7 that registered with Construction Industrial Development Board (CIDB) which involves in the residential construction project.

In executing of this study, there are limitations covered during the implementation. The major limitation in conducting this study is the study focusses on residential construction project. In this case, this study chooses Malaysia as the case study location. Other than that, the study will be constrained by availability of respondents as well as time limitation.

1.8   Research Methodology

This study is undertaken using the following methodology which involves literature review, questionnaire survey with the developer, consultants and contractors covering different role and work scope and the expert focus group interview with selected developer, consultant and contractor with more than 20 years of experience.

For literature review, it was to understand the existing practice for cost control, the critical causes of cost overrun and improvement measures in Malaysia's construction project. Then, based on the semi-findings from the literature review, the questionnaire survey was designed and the pilot test were run accordingly. The questionnaire survey was then distributed to the selected respondents and the data were then validated by the expert focus group.

1.9   Structure of Study

Chapter 1 will provide general overview or an idea of the study. The study will significantly define the background, purpose and the objectives for the study to be conducted. The study will briefly explain the conceptual framework in order to ensure the flow of the study is in place. The study briefly elaborates the significant of the study and also the scope as well as the limitation in conducting the study.

Chapter 2.2 will review past literature related to the study from different country. A comprehensive review will be conducted from past literature in order to identify the cause of the problems. Thus, these chapters will briefly describe on the current scenario of cost overrun in residential construction industry, and its causes.

Chapter 3 will discuss the type of methodology and the approaches in attempt to realize the main goal of this study. This chapter will explain the selection of research design and the methodology of data collection and statistical analysis tools applied in this study.

Chapter 4 will conduct and report the analysis of the study using the mixed method approach. The analysis will be conducted based on the questionnaire, aim and objective beforehand.

Chapter 5 is the last section of this study. This chapter presented the finding from the analysis and concluded with the recommendation for further research on the subject. This chapter also highlights the contribution of this study to the relevant body of knowledge.

REFERENCES

Ade A. A. A., Aftab H. M., Ismail A. R. and Ahmad Tarmizi A K. (2013). "Controlling cost overrun factors in construction project in Malaysia".

Ali A.S, and Kamaruzzaman S. N, (2010). "Cost performance for building construction project in Klang valley". Journal of building performance, Vol 1

Ameh, O.J., A.A Soyingbe and K.T. Odusami, (2010). "Significant factor causing cost overrun in telecommunication project in Nigeria". J. Construct. Dev. Counteries, 15: 49-67

Azhar, N. Farooqui, R. U. and Ahmed, S. M. (2008), "Cost overrun factors in construction industry in Pakistan", First international conference on construction in developing countries (ICCIDC-I, advancing and integrating construction education, research and practice)

Azlan R. N., Syed P. S., Abu B. and Mastura J. (2015). "Unveiling the challenges faced by Malaysian Housing developers through government policy changes".

Azlan S. A., Andrew S., Michael P. and Chan H. C. (2010). "Contractor's perception of factors contributing ti project delay: case study of commercial projects in klang valley Malaysia".

Choudhury, I. and O. Phatak,, "Correlates of time overrun in commercial construction", ASC Proceedings of the 40th Annual conference, Brigham Young University – Provo Utah, 2004.

Dharmasegaran A/L K. Nagamany (2016). "A study of the causes and effects of abandoned residential project in Malaysia". Faculty of Technology Management and business Universiti Tun Hussein Onn Malaysia.

E. Sriprasert. (2000) "Assessment of Cost Control System: A Case Study of Thai Construction organizations", (M.S. thesis, Bangkok: Asian Institute of Technology)

Enshassi A., Al-Najjar J., and Kumaraswamy M., (2009) "Delays and cost overruns in the construction projects in the Gaza Strip", Journal of Financial Management of Property and Construction, 14 (2), p. 126-151

George D and Mallery P, 2003. SPSS for Windows step by step: A

George D. and Mallery P. (2003), "SPSS for windows step by step: A simple guide and reference". 11.0 update (4th ed). Boston: Allyn & Bacon

George O., Fiona N., and Michael K. (2011). "Cost control technique used on building construction site in Uganda". Second International conference on advance in engineering and technology.

Hamzah A. R., Ali M., Abdul A. A., (2016) "Abandoned housing project in Malaysia: Risk Management capabilities during Rehabilitation," International Journal of Architectural Research.

Harisaweni, (2007). "The framework for minimizing construction time and cost overrun in padding and Pekanbaru, Indonesia". Master thesis, Universiti Teknologi Malaysia.

Ibrahim, A.R., M.H. Roy, Z. Ahmed and G. Imtiaz, (2010). "An investigation of the status of the Malaysian construction industry". Benchmark. Int. J., 17(2): 294-308.

Le H., L., Lee, Y.D., and Lee, J.Y., (2008), "Delay and Cost Overruns in Vietnam Large Construction Projects: A comparison with other Selected Countries," KSCE Journal of Civil Engineering, 12(6), 367–377.

Long, N.D., S. Ogunlana, T. Quang and K.C. Lam, (2004). "Large construction project in developing countries; A case study from Vietnam". Int. J. Proj. manage., 22: 553-561.

M. Tavakol, R. Dennick (2011). "Making sense of Cronbach's Alpha", International Journal of Medical Education, 2011; 2.53-55

Malaysia Economic Performance Fourth Quarter 2017. (2018), Department of Statistic in Malaysia

Marco A. D., Briccarello D., and Rafele C.,(2009) " Cost and Schedule Monitoring of Industrial Building Projects", Case Study. J. Constr. Eng. Manage. 135 (9): 853-862.

Memon A. H, Rahman I, Azis A. A. A., Nagapan S., and Q. B. A. I. Latif, (2012) "Time and Cost Perfomance in Construction Projects", IEEE Colloquium on Humanities, Science and Engineering Research (CHUSER 2012), held on 3-4 December 2012, Kota Kinabalu, Malaysia

Ofori G., (2011) "The Construction Industry; aspects of its economics and management", Singapore University Press.

Olawale, Y.A. and M. Sun, (2010). "Cost and time control of construction projects: Inhibiting factors and mitigating measures in practice". Construct. ManagEcon., 28(5): 509-526.

Sambasivan M., Soon Y. W., (2007) "Cause and effects of delays in Malaysian construction industry" , International Journal of Project Managemenr, 25, p. 517-526

Tien C. T, C. Ting, Kherun N. A, Godwin U. A and Omar M. (2012). "Critical cost factor of building construction project in Malaysia". The international conference on asia pacific business innovation and technology management.

Timur N. and Alberto D. M., (2011). 2nd International conference on construction and project management IPEDR Vol.15 LACSIT Press, Singapore.

Y. Frimpong, J. Oluwoye, and L. Crawford, (2003) "Causes of delay and cost overruns in construction of groundwater projects in a developing country; Ghana as a case study", International Journal of project management, 21, p.321-326,

Yap E. H. (2013), "Causes of abandoned construction project in Malaysia", Department of surveying, Faculty of engineering and science, Universiti Tunku abdul Rahman.

Zou, P.X. and Sunindijo, R.Y., (2013) "Skills for managing safety risk, implementing safety task, and developing positive safety climate in construction project". *Automation in Construction*, 34, pp.92-100