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A framework for avoiding cost overruns in Malaysian construction projects

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ABSTRACT

Construction industry contributes significantly in the growth of socio-economic development of a country. Construction sector not only provides essential infrastructures but also provides a high number of employment opportunities. One of the major challenges facing our construction industry worldwide for many years is the cost overrun. Construction projects in both developed and developing countries are facing this problem. Cost overrun in construction projects can occur due to many factors. Thus, this research will be conducted to identify the critical factors causing cost overrun in Malaysian's construction projects and to propose mitigation measures for causative factors. The review of the literature will be conducted to gather information on the current common factors causing cost overrun in construction projects in Malaysia. This research will adopt a mixed mode of quantitative and qualitative research design. A questionnaire survey will be conducted to identify severe factors causing cost overrun in construction projects in Malaysia. Furthermore, a qualitative study will be performed to identify the mitigation measures for each of the critical factors causing cost overrun. Then, a questionnaire survey will be conducted among construction experts in order to evaluate the most significant mitigation measures for cost overrun factors. It is hoped that the proposed mitigation measures can help construction practitioners particularly project managers to properly manage their construction projects so as to overcome unnecessary increase in project cost from its initial allocated budget.

1. Introduction

Construction projects act as one of the important contributors toward accomplishing sustainable development goals in a country. The successful completion of construction projects not only means the smooth development of fixed assets, but it also speeds up the growth of the national economy as a whole. A construction project is successful when it is finished on time, within budget, expected quality, in accordance with specifications and to stakeholders' satisfaction. Unfortunately, majority of the construction projects face many problems like excessive resource consumption, poor quality, low productivity, time overrun, and cost overrun. Cost overrun is one of the main problems in the construction industry (Mahamid and Dmaidi, 2013). Cost overrun is a common phenomenon in project worldwide whereby, only a few projects complete within the estimated budget. In global study of construction cost overrun, Flyvbjerg et al. (2004) found that 9 out of 10 projects faced cost overruns with a range of 50 to 100% overrun against estimated cost, overrun was found in each of the 20 nations and 5 continents in which the study was carried out; and cost overrun had been constant for the 70 years for which the data were available. The amount of cost overrun varies from project to projects; however, it is more common and in high amount in large construction projects compare to other construction projects (Jahren and Ashe, 1991; Kostka and Anzinger, 2015; Shrestha et al., 2013). The problem of cost overrun in construction projects is dominant in both developed and developing countries (Agren et al., 2011). The issue of cost overrun is more chronic in developing countries where overruns sometimes exceed 100% of the estimated cost (Azhar et al., 2008).The construction industry in developed countries is also affected by the problem of cost overrun. For instance, in the United Kingdom nearly one-third of the clients complaint that their projects overrun against the allocated budget for the projects (Jackson, 2002). Meanwhile, Chang (2002) also studied cost performance in the UK construction projects and found that 26 (25.2%) of 103 projects covered by the study faced cost overrun. In the USA, case studies

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conducted by Chang (2002) on four construction projects showed that all of them faced cost overrun in the range of 12.3% to 15.3%. In Germany, Kostka and Anzinger (2015) found that the average escalation for cost overrun was 63% in construction projects.

Cost overrun occurs due to various reasons in construction projects. The causes of construction cost overrun can vary from country to country because of the difference in the political, economic, social and environmental condition. Hence, the purpose of this proposal is to determine critical factors causing cost overrun in the construction project in Malaysia and to determine mitigation measures for each critical causative factors of construction cost overrun.

2. Problem statement

The construction industry can be considered as an important contributor to the Malaysian economic growth. In Malaysia, Construction sector shears 3.9% to overall GDP of the country (Bank Negara Malaysia, 2015). However, like other developing countries, Malaysia's construction industry is also facing the problem of cost overrun. In Malaysia, more than 50% of construction projects were found to experience cost overrun (Shehu et al., 2014). In a study of MARA construction projects by Abdullah et al. (2009), it was revealed that more than 90% of MARA construction projects experienced delay with significant effects on time and cost overrun since 1984. Furthermore, a survey conducted by Memon et al. (2012) regarding cost overrun in large construction projects showed that 96% of the large construction projects experienced cost overrun. Cost overrun in construction projects is caused by various factors. This cost overrun in construction projects can be minimized when their critical cause factors are identified. Deterring the mitigation measures for these critical causative factors would help in controlling the cost overruns in construction projects. Mitigation measures for cost overrun factors mean that the process by which construction project managers introduces specific measures to minimize or eliminate possible factors leading to cost overrun. According to Toh et al. (2011), there is a need for further investigations on construction cost overrun in Malaysia. Few studies have been carried out on the problem of cost overrun in construction projects. Majority of these studies stopped at finding the causing factors of cost overrun. Moreover, some of the studies had relatively small sample sizes, which may affect the reliability of their results. There is a lack of investigation on identifying the severe factors of construction cost overrun in Malaysia and determining the mitigation measures for each critical cost overrun factors. Hence, this study will focus on determining mitigation measures for each critical factors causing cost overrun in Malaysian construction projects.

3. Cost overrun in construction projects

Various researches have been conducted on the cost overrun in construction projects in Malaysia. In a very comprehensive study by Shehu et al. (2014) on 359 different construction projects, it was found that 62.8% of the private sector projects and 53.2% of the public sector projects experienced cost overrun. While, in a study of cost and time performance in central region of Malaysia, Rahman et al. (2012) concluded that cost overrun was a major issue in construction projects as agreed by 89% of the respondents. The results of the questionnaire survey in the southern region of Malaysia conducted by Memon et al. (2012), showed that 96% of the respondents agreed that their projects experienced cost overrun. More recently, the Kuala Lumpur International Airport 2 (known as KLIA2) also experienced the problem of cost overrun as the total cost of the project increased from RM1.6 billion to RM4 billion (Ismail et al., 2014; Nie, 2013).

Regarding factors of cost overrun, a study carried out by Memon et al. (2011) found that major causes of cost overrun were poor design and delays in design, unrealistic contract duration and requirements imposed, lack of experience, late delivery of materials and equipment, relationship between management and labour, delay preparation and approval of drawings, inadequate planning and scheduling, poor site management and supervision and mistakes during construction. Furthermore, Rahman et al. (2013) studied causative factors of cost overrun in large construction projects and found that the top 3 most significant factors of cost overrun were fluctuation in prices of material, cash flow and financial difficulties faced by contractors and poor site management and supervision. The results of a study carried out by Ali and Kamaruzzaman (2010) on residential building projects in Kalang valley completed during the years 2000-2009 with contract value of more than RM 5 million showed that the most serious factor contributes to cost overrun was inaccurate or poor estimation of original cost and the factor do not affect most was mistake in design. Ismail et al. (2014) found that poor site management and supervision, inadequate planning and scheduling, lack of experience, inaccurate time and cost estimates, frequent design changes, cash flow and financial difficulties faced by contractors, financial difficulties of owner, slow information flow between parties, shortage of site workers, shortages of materials, late delivery of materials and equipment, poor project management, and change in the scope of the project causes time and cost overrun throughout the project management life cycle. Jamaludin et al. (2014) found that major factors causing cost overrun during construction stage of construction projects were incomplete design drawings and specifications at tendering stage, changes in client requirements, financial difficulties faced by the contractors, fluctuation of material prices, poor planning, scheduling and monitoring, increasing of labour salaries, fluctuation of plant and machineries cost, lack of coordination among the

parties, scrape and rework, and lack of project team's experience. From the above studies, it can be concluded that there is still a lack of study on determining mitigation measures for each critical causative factors of cost overrun in order to control cost overrun in construction projects in Malaysia.

4. Research aim and objectives

This research aims to propose the mitigation measures for each critical factor leading to cost overrun in Malaysian construction projects. In order to achieve this aim, the objectives are set specifically as the followings:

Objective 1: To determine critical factors causing cost overrun in construction projects in Peninsular Malaysia.

Objective 2: To identify the mitigation measures for each causative factors of cost overrun in construction projects in Peninsular Malaysia.

Objective 3: To evaluate the most significant mitigation measures for each construction cost overrun factors.

5. Research methodology

This research will adopt mixed modes of quantitative and qualitative research. The methodology will be divided into the following stages:

5.1. Stage one: Extensive literature review

Literature review will be performed to determine the current common influencing factors of cost overrun in construction projects in Malaysia.

5.2. Stage two: Quantitative research design – questionnaire survey

A Questionnaire survey will be conducted to determine the critical factors of cost overrun in construction projects in Malaysia. For this purpose, questionnaire form based on the finding of literature review will be generated. Questionnaire form will contain two parts i.e. Part A and part B. In Part A, personal information of the respondent (i.e. work experience, organization, contract value of construction work) will be asked. Part B aims to identify the critical factors of cost overrun in Malaysian construction projects. The sampling frame will be construction entities such as clients, consultants and contractors having valid registration according to Construction Industry Development Board (CIDB) Malaysia.

5.3. Stage three: Qualitative research design - semi structured interviews

After the statistical analysis of first questionnaire survey results, an interview session with construction experts will be carried out in order to develop a list of measures for each critical cost overrun factors that can be used to control these factors. Interview protocol and qualitative instrument will be prepared to keep reliability and validity of data.

5.4. Stage four: Second questionnaire survey

A structured questionnaire survey among the construction experts will be carried out to evaluate the mitigation measures, in order to identify most significant mitigation measures for each cost overrun factors.

6. Expected finding and significance of the research

From the results of this research, possible mitigation measures for the critical factors causing cost overrun in construction projects in Malaysia will be determined. Recommendations will be formulated for improving cost performance in construction projects. The results of this study will be used as guidance to all construction practitioners such clients, consultants and contractors in order to overcome the cost overrun issue in their projects. When remedial measures for each uppermost cost overrun causing factors have been determined, it would be possible to control them. Minimizing and eliminating the cost overrun in construction projects will reduce the conflicts among construction practitioners. Above all, controlling and reducing construction cost overrun will minimize the possible increase in the final construction project cost. Thus, it will directly benefit the construction community and indirectly to the country economically.

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