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Critical cost factors of building construction projects in Malaysia

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Abstract

The objective of this study is to determine the critical cost factors of building construction projects. Survey data are randomly collected from building contractors in the Klang Valley, Malaysia. Each respondent is asked to assign a one-to-five rating for each of the 79 cost factors identified from the literature review. Priority ranking of these factors shows that only 35 cost factors are regarded by the respondents working for the small, medium and large construction companies in the Klang Valley, Malaysia as highly relevant for building construction projects. 'Client requirements on quality' is found to be the most critical factor that influences the costs of building construction projects.

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1. Introduction

Estimating is an art, not a science because there is no estimate that fits all work [1]. In fact, many past researchers perceived that qualitative factors including project complexity, project team requirement, contract requirements and market requirement [2–4] have a higher impact on the total project cost compared to quantitative factors such as gross external floor area, median floor height and construction duration [5,6] which are fixed by the client and designers at the early stage of the project.

2. Previous studies

Past researchers studied the factors affecting construction costs from various perspectives. However, different countries have different cost factors for consideration; therefore, construction cost estimating process requires an appreciation of a country's evaluation about the factors influencing the practice.

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Important cost factors being identified from the Nigerian construction industry are: the shortage of materials, financing methods and payments for completed works, poor contract management, materials cost, fraudulent practices and kickbacks, and the fluctuation of material prices [8,2].

Besides that, Akintoye [3] has studied on the factors influencing project cost estimating practice in the United Kingdom. Consequently, seven cost factor groupings, namely, project complexity, technological requirements, project information, project team requirement, contract requirements, project duration, and market requirement are categorised.

Research on factors affecting the bid/no bid decision in the Saudi Arabian construction contractors carried out by Bageis and Fortune [9] discovered that the most influential characteristics affecting the respondents' assessment of the weight of importance for decision-making in tendering processes are the size of contractor, contractor's classification status and the type of main client.

Based on the fact that construction cost estimation is subjective in nature, it is imperative to determine the factors influencing the costs of building construction projects in Malaysia as there is so far no investigation done in this area to the best of the researchers' knowledge.

This paper examines and ranks the cost factors that need to be considered when cost estimates are prepared in the various stages of the development of the building construction project by using a survey questionnaire to obtain the perceptions of the randomly selected samples of building contractors in the Klang Valley, Malaysia. Questionnaires sent via hand delivery to 154 Malaysian quantity surveyors, estimators and contractors working for the small, medium and large construction companies have yielded about 80% response rate. The paper also describes the survey's statistical analyses, which are comprised of Terrell's transformation index and Kendall's concordance test. The findings of this study found that there is an agreement among the different categories of building contractors in ranking the cost factors. [21]

3. Research methodology

This research is carried out in two stages. Firstly, literature survey and interviews with the quantity surveyors, estimators and contractors working for the small, medium and large construction companies in the Klang Valley, Malaysia are conducted to determine the factors influencing the costs of building construction projects. Pilot study involving semi-structured interviews is used to modify and improve the drafted questionnaire before sending it via hand delivery to the potential respondents. Seventy-nine factors are identified and categorised into seven different groups in this investigation. They are project complexity, technological requirements, project information, project team requirement, contract requirements, project duration, and market requirement that influence the costs of building construction projects as categorised earlier by Akintoye [3]. These groupings comprehensively cover all the criteria that need to be considered in the cost estimating process.

Secondly, a questionnaire survey methodology is employed to determine and rank these factors according to their levels of influence on the costs of building construction projects. The survey questionnaires are sent via hand delivery to 154 Malaysian quantity surveyors, estimators and contractors working for the small, medium and large construction companies identified from the Malaysian construction industry directory (MCID) version 2008 to 2009 under the category of building construction contractors produced by the Construction Industry Development Board (CIDB) Malaysia. Hence, the paper attempts to test the null hypothesis that: there is no agreement among the different categories of building contractors in ranking the cost factors.

The response rate for the questionnaire survey is about 80% which is very much higher than the normal rate of 20% to 30% for most postal questionnaire surveys of the construction industry as reported by Elhag et al. [7]. In examining the level of influence for each factor, a five-point scale of 1 to 5, where (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree) is utilised to determine the respondents' perceptions on the extent the factors influence the costs of building construction projects in their organisations.

4. Analysis and ranking of cost factors

Terrell's transformation technique can be used to convert ordinal data into indices [10]. In this research, Terrell's transformation index computation is employed to rank the cost factors based on their levels of influence. It is illustrated by the equation below:

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