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Research paper



Cost Overrun Factors Involving Local Private Residential Projects in Malaysia

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Abstract

Cost is the prime factor for driving to the successful of a project. A poor cost performance become a common problem in worldwide which bring a significant financial risk to both contractors and clients. Construction projects are relatively risky because the projects operate in a complexity and dynamic situation. This study aimed to explore the major contributors of cost overrun and propose strategies in minimizing the cost overrun factors involving local private residential projects in Malaysia. A quantitative method was applied to the respondents from contractors firm Grade G7 in Selangor area, and the data were analyzed using Likert scale to obtain mean score. There are 5 categories of cost overrun factors found from previous studies. Design error and poor contractors site supervision were ranked as the top two contributors to cost overrun in Private Residential Projects. Additionally, 79% of the respondents agreed that construction projects face cost overrun with an average amount of 1-5% of contract sum. 9 strategies are available to overcome the problems and the result shows that effective strategic planning is the most effective mitigation.

Keywords: *cost overrun, strategies, construction industry, private, residential projects*

1. Introduction

In the construction industry, the main purpose of controlling a project is to make sure that all projects complete on time, cost and quality and achieve the client's goals and objectives. Nevertheless, cost overrun is a major issue and is a frequent phenomenon features in all the construction industries. Construction cost overrun factors has become a global concerns amongst all the construction parties and educational researchers [1]. As in the developing country, the construction still in growing status and thus the practices of planning and estimated budget will definitely being lag behind. Therefore, it is essential to identify the related cause factors that affect the cost overruns, investigate the possible impacts and minimize the risks in future projects.

Private Residential Buildings are mostly demanded by the consumers whose monthly income are stable and relatively high enough to cover the rental rate [2]. According to Shehu et.al [3], a comparison of public projects and private projects has been made in relation to cost overrun. The result showed that the private projects were more often facing cost overrun problem as compared to public projects. Thus, private projects will also encounter cost overrun factors despite there is enough cash flow during construction. Same study also proved that residential projects were facing the higher deviation of cost overrun compared to the other types of projects (infrastructure, commercial, office, and educational etc.). Therefore, this study is mainly focused on Private Residential Projects to overcome the problems.

Economic growth of a country highly depends on the construction industry itself as it contributes to the Gross Domestic Product (GDP) growth of a country[1]. Cost is the most critical factor behind the project success but it is unusual to complete a project within stipulated amount [4]. According to Endut, et.al [5], there is only 46.9% of the public sector and 37.3% of private sector projects are finished within the specified budget in Malaysia. Result from Memon et. al [1], cost overrun was a big issue in most of the projects as agreed by 96% of respondents. In the survey, the financial risk is still the most significant risks associated with the Malaysian Construction Industry [6].

2. Cost overruns

Cost overrun can be defined as the difference between the actual budgets spent in completion date and the set amount of contract sum agreed by client and contractor at tendering stage [7]. Cost overrun is a very common phenomenon and majority projects in construction industry facing this problem [8]. On the other hand, cost overrun occurs when the resultant cost target of a project exceed its cost limits where cost limit of project refers to the maximum expenditure that the client's is prepared to incur on a completed building project [1].

Cost is amongst the major issues throughout a project lifecycle and is considered as a key factor of project success in this universal. Cost overrun is determined as a major concern within the construction industry worldwide [9]. The transportation projects are the most significant projects that have faced cost overruns factors from time to time [10]. Most of the cost overrun cases are happening at the developing countries due to the sluggish economic conditions which affect the construction industry to grow [8].

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2.1. Cost Overrun Projects in Malaysia

A study done by Waris et. al [11] declared that 16th storey height of condominium at Rawang caused a cost overrun case with the total amount of RM 1.43 billion. In this case, it is believed that residential project can lead to such a big amount of cost overrun and thus, cost overrun should not be eliminated for any types of project. Another study done by Endut et al. [5], analyzed this cost overrun problems by exploring 308 public and 51 private projects. They realized that only 46.8% of public project and 37.2% of private projects completed within the estimated budget respectively with the average cost deviation of 2.08% and the maximum deviation was 80.76% of the total project cost so far. In addition, it is discovered that more than 90% of the large construction projects in MARA (Majlis Amanah Rakyat) suffered with major effects of cost overruns [12]. Based on all the literature review from different articles, there is no much studies related to cost overrun in Private Residential Projects (PRP). Thus, this study intent to find out what are the factors affecting cost overrun and remedies to overcome the problems focusing in PRP

2.2 Factors affecting cost overrun in Malaysia

The most significant cause of cost overrun factors are material price fluctuations, contractor's cash flow and financial problem, delay in payment by client, frequent changes in design, shortage of materials and poor performance on controlling budget on site [1]. The critical factors for cost overrun are underestimated of construction cost by Quantity Surveyors, poor estimation on original project, poor project planning, lack of experiences, poor management in contract administration, high machinery cost, fluctuation prices of materials in market, unpredictable site conditions and so on [8].

On the other hand, a research in MARA large construction projects [12] established that cash flow problems faced by contractors during work, insufficient knowledge by contractors, shortage of site labors, contractor's poor site supervision, mistakes in planning and scheduling by contractors are the most critical factors whereas changes of scope of works and design are the least affecting factors on cost overrun in construction.

Table 1 below shows the summary of five (5) categories of cost overrun factors from various sources with specific impacts;

Table 1: Factors Affecting Cost Overruns.

Cost Overrun Factors	References
Poor Contractor's Site Supervision	[8], [12]
Contractor's Cash Flow Problems / Financial Management Problem	[13]
Design Errors	[14]
External Conditions	[15], [2]
Resources Available	[8]

Poor site management and supervision has caused negative impact on the work progress. It affect the overall progress of works and affects productivity significantly; which increase cost overruns on site [8], [12]. The cash flow forecast of a construction contract project deals specifically with the payment under particular construction contract. Cash flow and financial difficulties faced by contractors is the other factor since they need to wait for loan approval from financial institution [13].

Incomplete design and lack of information in the planning stage, and absence of design specifications are the critical factors which caused cot overruns in construction project [14]. Furthermore, the external conditions are comprise of weather conditions and political problems. The weather conditions will physically affect the construction project while political problems include unstable politics, frequent policy changes, etc [15]. The construction industry is highly dependable on the economic condition of a country which means if the policy of a country is unstable, the economy will drop immediately [2].

The other common problem that affects the construction project is including the shortage of skilled labour, lack of equipment and low productivity, which categories under the factor of available resources. Material price fluctuarion is also one of the major causes of cost overrun [8].

Moreover, Memon, et.al [1] found that there are seven (7) categories of cost overrun factors such as Contractor's Site Management (CSM), Project management and contract administration (PMCA), labor related factors, design and documentation (DD), material and machinery (MM), financial management (FM), information and communication (IC) and external factors (EF). Results proven that contractor's site management are the most serious factors of cost overrun, followed by information and communication factors, while the least category is financial management factors.

2.3 Minimizing the cost overrun factors

The high risk nature of a construction project may lead to many cost overruns in its history of construction. Hence, contractors should implement a systematic approach to manage the risks. Hence, strategies in minimizing the cost overrun factors has been identified and categorized in 3 (three) different groups i.e. remedies to contractors, remedies to owners, and remedies to all the parties respectively as shown in Table 2;

Table 2: Strategies in Minimizing the Cost Overrun Factors.

Parties	Strategies	References
Contractors	Effective strategic planning during project execution	[16]
	Effective site management and supervision	[17]
	Frequent progress meeting with client	[18]
	Experienced sub-contractors and suppliers	[19]
	Appropriate construction method/ advance construction technology	[18]
Clients/ Employers	Developing human resources in construction industry	[20]
	Hired risk management team	[6], [21]
Consultants/ All Parties	Clear flow of communication and information	[22]
	Frequent coordication between parties	[18], [22], [23]

An effective strategic planning approach is needed to be used by project manager or contractor to reduce the risk level of any project [16]. Additionally, the purpose of effective strategic planning is to minimize the occurrences of risks which might lead to project failure. At the same time, sub-contractors are the actual persons who put effort to carry out construction works [19].

Consequently, construction is highly dependent on the machinery and the updated technique of work. However, due to the complexity and uniqueness in its nature, construction projects are always encountered risks and this require to adopt an advance technology at the initial stage[18]. Human Resources are the also important for any projects as construction projects are labor intensive. It requires a systematic human resource management to manage all the labor's salaries and enquires [20]. Effective risk management can bring a greater reward to project performance. Risks can not only affect the achievement of the project goals but also influence the occurrence of one another. Hence, owner or client can hire a group of risk management team to manage the risks or avoid uncertainties [21].

A clear communication channel is essential to deliver the information clearly between all the parties involved in the projects. The work of all parties is inter-related and highly depending with the works of other party. For example, Quantity Surveyors (QS) must work with Civil Engineers while doing the earthwork measurement. The QS may need to enquire all the unclear information from Civil Engineer so that the measurement may carry out

smoothly and accurately. Hence, it is very important that the mode of communication can be delivered effectively to avoid any disputes or errors during construction [22]. All the parties such as client, contractor, consultant, and sub-contractors etc. should compromise with each other during project execution. Whenever there are any problems occurred, they should solve the issues together rather than criticizing who is liable to the defaults. If all the parties could coordinate to each other, it can avoid argument and the problems can be solved consistently.

3. Methodology

Questionnaires were distributed to the contractors who are registered under CIDB Grade 7 in Selangor, Malaysia. The survey was conducted in order to obtain data in relation to the cost overruns factors and strategies in minimizing the cost overruns factors for construction project.

After gathering all the data from the survey, data analysis could be carried out based on the information. In this stage, it involves evaluation of the data according to the objectives of the research. Quantitative data from the respondents will be analysed using Microsoft Excel. Data collected for the first objective which involves the identification of factors that lead to cost overrun in Private Residential Projects, and the factors will be analysed using Five-Points Likert Scale (1=strongly disagree, 2=disagree, 3=moderate, 4=agree and 5=strongly agree). Same goes for the second objective which is the strategies in minimizing the occurrences of cost overrun factors.

The outcome from the questionnaire made based on the mean score value for each research objective to evaluate the most significant factors and strategies in minimizing the cost overrun factors. Quantitative data represents the result in a mathematical form to quantify all the data and transform them into a table or chart form which is convenience for the reader to understand the result clearly. In this study, 100 respondents were chosen from G7 contractor firms in Selangor state. The expected response rate is 30% which is a minimum feedback required to ensure the accuracy of the results.

4. Result and Findings

Results collected from the questionnaire survey were analysed and interpreted accordingly in order to achieve the research objectives by using histogram and bar charts. A total of 100 sets of questionnaires were sent to different G7 Contractor Firms in Selangor state that specifically handled private residential projects. 67 respondents responded and returned the questionnaires.

From the result obtained, it indicates that most of the respondents are having more than 5 years of working experience which gives a big benefit to the research. The reason is that respondents with more years of experience will be able to provide more effective answers regarding to the cost overrun factors in private residential projects as they may face several project failures due to cost overrun before.

4.1. The cost overrun factors

Figure 1 above shows that design errors is the major factor as agreed by large group of respondents which is mean score 2.75. Second highest is poor contractor's site supervision, which is mean score 2.31. Conversely, this designates that most of clients will not actually encounter financial difficulties in PRP because it is private projects and private funds are usually stable than public, which the amount of contract sum may not exceed their budgets.

Client should aware of this problem while making decision at the preliminary stage because design is the major part of a construction project. If there is design error, it means the whole project has to restart again and it may incur a large amount of money. Frequent changes in project scope may lead to cost overrun as well. For example, at the beginning of the project, client decided to construct a shop lot at the piece of land, but after few months, he changes the decision to build a condominium. This frequent changes the scope of project may waste the time and also cost which spent in preparing the previous project during the few months. Thus, client or owner should make a precise decision at the time of discussion.

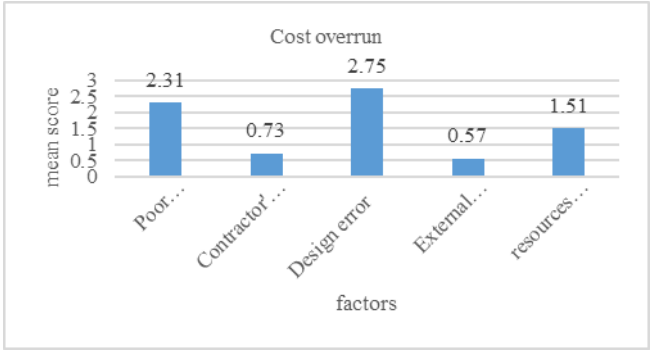


Fig. 1: Cost overrun factors

4.2. Strategies in minimising the cost overrun factors

Figure 2 below presents the ranking for the strategies in minimizing cost overrun factors. The top three most effective strategies are effective strategy planning which is 3.01 mean score. It is proven as the most remedies research done by Peteer and Madaus [16] in 2016 indicate that this approach is needed to be used by project manager or contractor to reduce the risk level of any project. Effective site management and supervision is the second effective remedies which is 2.67 mean score. Marzouk and El-Rasa [19], supported that the purpose of effective strategic planning is to minimize the occurrences of risks which might lead to project failure. Moreover, sub-contractors are the actual persons who put effort to carry out construction works. The third ranking is frequent progress meeting with client which is 2.42 mean score. There are always uncertainties occurred in the construction projects which can affect the project performance. Thus, in order to improve the performance and to resolve the uncertainties faced during project execution, it is necessary to arrange regular progress meeting to discuss the project related matters [24]

In contrast, use of updated technology in construction, hired proper risk management team, and developing human resources in construction industry were ranked at the last three not effective remedies.

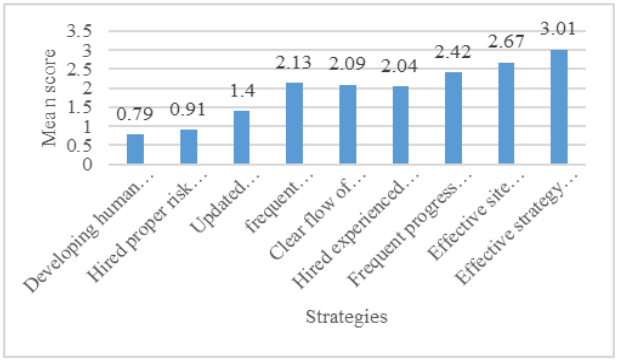


Fig. 2: Strategies in minimising the cost overrun factors

5. Conclusion

Most of the respondents are more than 5 years of working experience and their designation are project manager and assistant quantity surveyor. It shows that the data collected are more reliable and

useful. Among all the sub-factors, design errors and poor contractor's site supervision were ranked as the first and second place by respondents which can lead to serious impacts towards the construction projects.

As a result, an effective strategic planning is the most effective strategies to resolve all the cost overrun issues during construction, followed by effective site management and supervision. These two strategies are the solutions for contractors to resolve the issues during construction because contractor is the one who handles the project from the start until the end of the project. Hence, the two strategies are very important to minimize the occurrences of the cost overrun for the contractors. All the strategies will be formulated for improving cost performance in construction projects. After all, controlling and reducing construction cost overrun will minimize the possibility of increasing the final cost and thus, it can reduce the conflicts between the construction parties.

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