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Research Article

Investigating the Primary Problems and Current Practices of Built-up Rates in the Malaysian Construction Industry

Haryati Binti Ismail[*], Nor Asma Binti Mamat [2] and Zahurin Binti Husin [3]

[1,2,3] *Civil Engineering Department, Politeknik Kota Bharu, Malaysia*

[*]*(haryati@pkb.edu.my) Email of the corresponding author*

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Abstract – This study aims to investigate the primary problems and current practices of the built-up rate in the Malaysian construction industry from the perspectives of various construction players. The built-up rate is a crucial cost estimation method in construction projects, and inaccurate estimates can have a negative impact on the project's success. The literature review highlights the importance of cost estimation in construction and the challenges faced in producing accurate and reliable estimates. The study collected data from 300 respondents through an online survey, and the analysis of 293 valid responses shows that changes in market price is the primary problem faced by respondents in the built-up rate. This issue includes outdated market prices, price fluctuations, lack of information about prices, and inflation. Other problems identified were difficult to determine labor constant and inconsistency in the formula. The study provides insights for industry practitioners to improve the current practices and address the primary problems faced in the built-up rate method to enhance cost estimation accuracy and the success of construction projects.

Keywords – Built-Up, Construction, Estimation, Rate

I. INTRODUCTION

One of the most critical factors for ensuring the success of a construction project is accurate cost estimation. This involves calculating the projected cost of a project, taking into account each of its distinct components. Built-up rate estimation is a particularly important form of cost estimation for those in the construction industry. The built-up rate is used by clients as the foundation for their cost projections, by designers as a guide during the design process, by estimators to calculate costs, and by contractors to enter building contracts. This method considers every element of a project, from labor to materials, and computes a total cost for each item in the construction process. The built-up rate is expressed as the cost per unit of measurement, such as the cost per cubic meter or kilogram.

It's crucial to note that errors in cost estimation can have a significant impact on a project and cause problems at any stage of its lifecycle. However, despite its importance, there has been limited discussion about the built-up rate estimation method. Therefore, the primary objective of this study is to identify the primary issues and current practices of the built-up rate from the perspective of construction professionals in the Malaysian construction industry.

In the construction industry, cost estimation plays a vital role in ensuring the success of a project. It is

an essential process that determines the estimated cost of a project and aids decision-makers in budget allocation and management. However, producing accurate and reliable estimates can be challenging due to the complexity of the construction process and the multitude of tasks involved [1]. As in [2], one of the major challenges in cost planning is realistic cost estimation, which is often uncertain and complex.

In addition to the challenge of producing accurate estimates, construction organizations are also struggling with pricing systems that may lead to underestimation of construction costs [3]. This can prevent construction firms from offering their services at competitive prices and may lead to financial losses. Reference [4] noted, both under- and overestimates can be costly, and attention must be paid to the estimating tasks.

To ensure the accuracy of cost estimation, construction players utilize various methods, including the built-up rate. The built-up rate is a form of cost estimation that considers every component needed for the project, from labor to materials, and computes a total amount that establishes the cost of items in the construction project. The client, designer, estimator, and contractor all use the built-up rate for different purposes, such as the foundation for the client's cost project, guidance for the designer during the design process, and estimating the cost for the estimator [.

Generally, cost planning and control are critical to the success of construction projects, and accurate cost estimation is crucial in achieving this success. However, due to the challenges involved, more research and discussions are needed to identify the primary problems and current practices in cost estimation methods like the built-up rate.

II. METHOD

The data for this research was collected through an online survey using Google Forms that lasted for a period of two weeks. A total of 300 respondents from the construction industry in Malaysia participated in the study, including clients, consultants, contractors, educators in the field of quantity surveying, municipalities and authorities, as well as quantity surveying freelancers. The survey comprised a series of open-ended questions that were focused on the issues under investigation. The demographic data collected was analyzed using descriptive frequencies. In order to analyze the responses to the open-ended questions, content analysis was employed, which is a commonly used technique for such questions ([6],[7]). This involved identifying and categorizing statements from the respondents in order to gain a better understanding of the situation being studied.

III. RESULTS

The study consisted of 300 participants who voluntarily provided their responses, out of which 293 responses were deemed valid. The participants belonged to various organizations and were located in different states of Malaysia. The majority of the respondents, more than 50%, were from the contractor background, followed by consultants, while the supplier group had the least number of respondents. As for the position within the organization, the majority, 44%, were quantity surveyors, and the next largest group were assistant quantity surveyors, comprising 34% of the participants. This distribution is expected as these roles play a crucial role in building cost estimation and control.

The first objective of this study was to identify the primary challenge in establishing building rates. The table presents the main problems faced by the respondents in determining the built-up rate in the construction industry. A total of 293 valid responses were collected in this study.

The most frequently mentioned problem was changes in market price, which was reported by 38.9% of the respondents. This indicates that the respondents found it challenging to keep up with the constantly changing market prices of materials and services required for the construction project.

The second most common problem was difficult to determine labour constant, reported by 13.6% of the respondents. This suggests that the respondents found it challenging to estimate the labour required for the construction project accurately.

Other significant problems mentioned by the respondents were inconsistence formula (10.6%), complicated process (9.6%), difficulty in getting quotations from suppliers (6.5%), inaccurate price calculation (4.4%), lack of skill (3.8%), lack of reference (3.1%), and lack of experience (2%).

It is interesting to note that the latest technology was reported as a problem by only one respondent, indicating that the use of technology in the built-up rate estimation process may not be a significant concern for most respondents.

This data provides useful insights into the problems faced by the construction industry in Malaysia in determining the built-up rate, which can help in developing strategies to overcome these challenges and improve the accuracy of cost estimation.

Table 1: Primary problem in building up rate

No	Item	Frequency	Percent (%)
1	Difficult to determine labour constant	40	13.6
2	Inconsistence formula	31	10.6
3	Changes in market price	114	38.9
4	Complicated process	28	9.6
5	Latest technology	1	0.3
6	Difficult to determine plant and machinery output	5	1.7
7	Inaccurate price calculation	13	4.4
8	Lack of skill	11	3.8
9	Lack of experience	6	2
10	Difficulty in getting quotations from suppliers	19	6.5
11	Time consuming	8	2.7
12	Lack of reference	9	3.1
13	Changes in specification	3	1
14	Not updated with current price index	3	1
15	Difficult to determine wastage of materials	1	0.3
16	Location factor	1	0.3
	Total	**293**	**100**

The study' second objective was to identify the current methods used by respondents in calculating the built-up rate. Table 2 shows twelve methods used by the respondents, with manual calculation being the most commonly used method at 28.3%. Obtaining project and existing data was the second most used method at 12.6%, followed by getting quotations from subcontractors or suppliers at 11.6%. The least popular method was to hire an expert due to the high cost involved. However, some respondents relied solely on their experience, which is considered a risky method. The table indicates that the use of technology is prevalent among the respondents, with almost 20% of them using Microsoft Excel for their calculations.

Table 2: Current built-up rate method

No	Item	Frequency	Percent (%)
1	Previous project and data	37	12.6
2	Calculate manually	83	28.3
3	Using schedule of rate published by PWD	26	8.9
4	Refer books and notes	10	3.4
5	Get quotation from subcontractor / supplier	34	11.6
6	Adding percentage to the previous rate	7	2.4
7	Based on current market price	15	5.1
8	By experience	2	0.7
9	Refer colleague and senior	4	1.4
10	Calculate by using excel	58	19.8
11	Assuming	14	4.8
12	Appoint others	3	1
	Total	**293**	**100**

In Table 2, it can be seen that some respondents used outdated methods such as relying on books and notes, and assuming figures instead of using actual data. This indicates a lack of up-to-date knowledge and skills in the industry. Moreover, the fact that some respondents rely solely on their experience also shows a lack of willingness to embrace new technologies and methods.

To improve the accuracy and efficiency of built-up rate calculation, respondents should consider using more modern methods, such as software specifically designed for construction cost estimation. This would also require respondents to keep themselves updated on the latest technology and techniques in the industry.

IV. DISCUSSION

The results of the study highlight the challenges faced by the construction industry in Malaysia in

determining the built-up rate, which is a crucial aspect of cost estimation. The most commonly reported problem was changes in market price, indicating that the respondents found it challenging to keep up with the constantly changing prices of materials and services required for construction projects. The second most common problem was difficulty in determining the labour constant, suggesting that the respondents found it challenging to estimate the labour required for a construction project accurately.

Other significant challenges reported by the respondents included inconsistence formula, complicated process, difficulty in getting quotations from suppliers, inaccurate price calculation, lack of skill, lack of reference, and lack of experience. It is interesting to note that the use of technology was not considered a significant problem by most respondents, which indicates that the industry is willing to embrace modern methods and tools for cost estimation.

The table also shows that manual calculation using Microsoft Excel is the most commonly used method for determining the built-up rate, followed by obtaining project and existing data and getting quotations from subcontractors or suppliers. It is encouraging to see that some respondents are using technology, but there is still a significant proportion relying on outdated methods, such as books and notes or assuming figures.

To improve the accuracy and efficiency of cost estimation, respondents should consider adopting more modern methods, such as software designed specifically for construction cost estimation. This would require the industry to keep up with the latest technology and techniques and embrace new approaches to cost estimation. By doing so, the industry can overcome the challenges highlighted in the study and improve the accuracy of cost estimation in construction projects.

V. CONCLUSION

The study aimed to identify the primary issues and current practices of the built-up rate from the perspective of construction professionals in the Malaysian construction industry. The findings of the study revealed that changes in market prices and difficulties in determining labor constants were the most significant challenges in establishing building rates. The study also found that the built-up rate is primarily used by contractors in the construction industry and that accurate estimation of the cost of materials and services is critical for the success of a construction project. Additionally, the study found that the use of technology in the cost estimation process is becoming more prevalent in the construction industry in Malaysia.

These findings suggest that the construction industry in Malaysia needs to develop more accurate and reliable methods for estimating the cost of materials and services to ensure the success of construction projects. Furthermore, it is crucial to keep up with the latest technology to improve the accuracy and efficiency of the cost estimation process. This study provides valuable insights into the challenges faced by the construction industry in Malaysia and can help in developing strategies to overcome these challenges and improve the accuracy of cost estimation.

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