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BIM and Future of Quantity Surveyors in Malaysia's Construction Industry

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Abstract

Over the past era, the complicated procedures and complexity of designs had become challenging to the Quantity Surveying practices. Errors in term of quantities and time consumption are the major impact on Quantity Surveyors when it comes to performing their task. Building Information Modelling (BIM) has been introduced in 2012, developed and expanded in the construction industry to minimize errors while improving the efficiency of work in terms of time, cost, and accuracy of quantities measured. Thus, this research aims to identify the impact of BIM tools on the roles currently played by the Quantity Surveyors in our local industry. To achieve the aim, this research investigated the usage of BIM tools by the Quantity Surveying consultant firms by analysing the demand for its usage and its effect to the overall profession. A survey-based approach was conducted, whereby 33 sets of sampling size were identified through a random sampling method with only 25 sets of questionnaires received from the respondents. Findings from questionnaires showed that the adoption of BIM did leave significant impacts on Quantity Surveyors practices in the long run. Results have shown that the level of awareness on BIM is still low among the Quantity Surveyors. However, BIM is still worth being implemented as it could help to improve in terms of time saving and accuracy of measurement. This will improve the Quantity Surveyors' profession tremendously in the future

Keywords

Building Information Modelling (BIM), benefits of BIM, effects of BIM, Quantity Surveyors, Malaysia Construction Industry

Introduction

The construction sector shares 12.2% of world Gross Domestic Product (GDP), with the Global Construction 2025, reported that almost 70% of construction work would be occurring around the world (Branson, 2013). In Malaysia, the number of construction sections has grown from 8 to 10%, with the value of the shares increase from 3 to 4.7% of the local GDP (Economic and Financial Developments in Malaysia; First Quarter of 2015). It is necessary to make a change in the construction industry to increase competitiveness among the developing countries.

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Quantity surveying can be said as an amalgam, which is involved in several disciplines such as economics, law, accountancy, management, information technology, construction technology, and so on within a built environment. Before that, the quantity surveyor is known as the 'Construction Industry Accountant.' However, the complicated procedure and complexity of design had caused a negative impact to the quantity surveying profession. Errors in terms of measurement and time consumption are the significant impact of quantity surveyor when it comes to performing the task. Building Information Modelling has been developed and invented in the construction industry to minimize such errors. At the same time, in the meantime, improve the quality and efficiency of work by all the relevant consultants and designers, including quantity surveyors.

The rise of Building Information Modelling (BIM) technology has emerged into the construction industry as part of the application tools that aid in improving the construction projects' productivity. The advancement of BIM has wholly turned the quantity surveyor field of work into various key areas and not only focus on cost management (Verster, 2006). They are now actively participated as a legal and expert specialist to manage contractual issues, be an expert advisor or negotiator in dispute resolution such as arbitration or adjudication, providing legal advice to the client during pre and post contract time, and so on especially in this ever rapidly subtle change of technology in the construction industry. These processes can transform all the information into digital files that describe every detail of the project. Hence, there is a high possibility that the adoption rate of Building Information Modelling (BIM) in Malaysia will increase gradually. However, due to the complexity of nature and characteristics, the construction industry still having time, cost, and quality issues.

This research will discuss the concept of BIM, comparison between the traditional and current method of work performed, the process used by quantity surveyors in each construction phase, the future of BIM technology, and the type of BIM tools commonly adopted by quantity surveyors. Other than that, this research aims to identify the effect of BIM on the roles of quantity surveyors in the construction industry and its benefits. A survey based on a quantitative approach has been conducted to prove the effectiveness of BIM towards quantity surveyor practices and identify the future of quantity surveyors with the adoption of BIM.

Methodology

The research methodology included in this study is the literature review, questionnaires, and SPSS method. The literature review was the first phase of the research, which would collect secondary data derived from books, journals, thesis and dissertations, articles, reports, and conference proceedings. The second phase comprises of a collection of primary data through questionnaires survey. The questionnaire survey conducted to achieve the objectives of the study, which is to investigate the usage of BIM tools by the Quantity Surveying consultant firms by analyzing the demand for its usage and its effect on the overall profession. Respondents of this study selected from the listed Quantity Surveyor under the Board of Quantity Surveyors Malaysia (BQSM) in the Selangor area. Overall, there were 33 chosen respondents. Data analysis interpret into a graphical or table form by using the SPSS method.

Results and Discussion

From Table 1, it can be seen that the differences between the mean of 1 to 3 QS selection are -0.08497. Whereby this amount is obtained by deducting the mean of the respondent with BIM adoption and respondent without BIM adoption on the selection of 1 to 3 QS involved in one project in Table 2. This amount -0.08497 means that the mean of the respondent with BIM adoption is significantly smaller than the respondent without BIM adoption. This example can be applied to the selection of 4 to 6 and 7 to 9 QS involved in one project, where the mean differences is positive value means that there are more responses from respondent without BIM adoption.

Table 1: Group Statistic of Respondents on the selection of Number of QS involved in one project

	Knowledge on BIM	No.	Mean	Std. Deviation	Std. Error Mean
1 to 3 QS involved in one project	Respondent with BIM adoption	9	.4444	.52705	.17568
	Respondent without BIM adoption	17	.5294	.51450	.12478
4 to 6 QS involved in one project	Respondent with BIM adoption	9	.4444	.52705	.17568
	Respondent without BIM adoption	17	.4118	.50730	.12304
7 to 9 QS involved in one project	Respondent with BIM adoption	9	.1111	.33333	.11111
	Respondent without BIM adoption	17	.0588	.24254	.05882

H_0 = There is no significant difference on the number of QS involved in one project with BIM adoption
H_1 = There is significant difference on the number of QS involved in one project with BIM adoption

Table 2: Independent Sample Test for the Number of QS involved in one project

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Lower**	**Upper**
1 to 3 QS involved in one project	Equal variances assumed	.066	.799	-.397	24	.695	-.08497	.21383	-.52629	.35636
	Equal variances not assumed			-.394	16.064	.699	-.08497	.21549	-.54163	.37170
4 to 6 QS involved in one project	Equal variances assumed	.080	.780	.154	24	.879	.03268	.21187	-.40460	.46996
	Equal variances not assumed			.152	15.864	.881	.03268	.21448	-.42232	.48768
7 to 9 QS involved in one project	Equal variances assumed	.838	.369	.459	24	.650	.05229	.11383	-.18265	.28723
	Equal variances not assumed			.416	12.617	.684	.05229	.12572	-.22016	.32473

Based on Figure 1, 2 and 3, it can be seen that the test statistic, t value is in between the critical value. Therefore, it can be concluded that this null hypothesis is not rejected and reject alternative hypothesis. In other words, it is said that there are no changes in the number of QS involved in one project whether with or without BIM adoption.

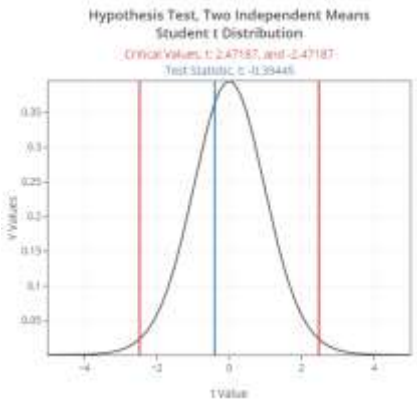

Figure 1: Hypothesis Test, Two Independent Means of 1 to 3 QS involved in one project

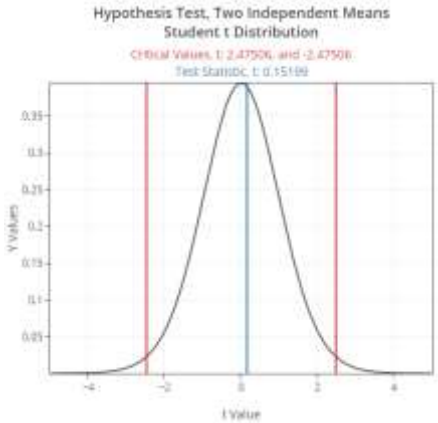

Figure 2: Hypothesis Test, Two Independent Means of 4 to 6 QS involved in one project

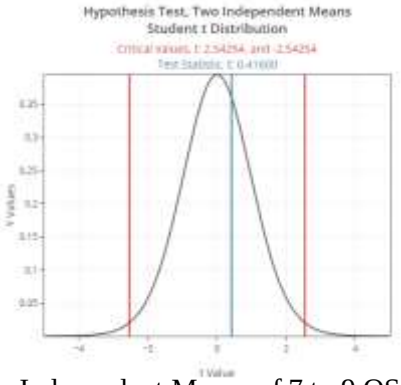

Figure 3: Hypothesis Test, Two Independent Means of 7 to 9 QS involved in one project

Conclusions

In summary, it was found that the level of awareness regarding BIM and its implementation are still low among the practicing Quantity Surveying Consultant Firms. While looking into demand of Quantity Surveyors in projects implementing BIM and not implementing BIM it was found that there were not much differences in the demand. Thus it proves that implementing BIM in a project does not affect the Quantity Surveyor profession. It is also concluded that adopting BIM in projects would bring more benefits to Quantity Surveyors rather than disadvantages. It was seen from the research that the top three benefits are saving the time consumed by a Quantity Surveyor on work, reduce their workload and increase their work accuracy and quality. Based on these findings, we could say that more training and seminars could be given to all Quantity Surveyors for them to enhance their knowledge and skills of using BIM subsequently enable them using BIM in construction projects. However further studies are still needed to get overall perception on BIM by practicing Quantity Surveyor all over Malaysia to get more insights compared to the conducted research.

References

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