ENHANCING THE EFFECTIVENESS AND EFFICIENCY BY ADOPTING BUILDING INFORMATION MODELLING IN THE SERVICE DELIVERY OF THE QUANTITY SURVEYING PRACTICE OF SRI LANKA

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Introduction

The global construction industry is moving in the direction of widespread application of BIM technique (Raic, 2007). In the worldwide construction sector, particularly in the Quantity Surveying field, there has been a paradigm change from traditional service delivery techniques to completely automated, by using BIM (Jayasena & Weddikkara, 2013). Jayasena and Wedikkara (2013) emphasized, implementation of BIM applications for the Quantity Surveying practice is a fear among Quantity Surveyors in Sri Lanka since the professional's existence is disturbed by the threatening and challenging nature created when employing BIM within the QS practice (Nagalingam, Jayasena, & Ranadewa, 2016).

The problem is to identify the factors contributing to the delay in using BIM in the QS contribution to the project. The QS needs to escalate the usage of BIM by understanding its potentials and developing streamlined methods to incorporate BIM into their current and future professional practices (Partridge, 2015). The main aim of this research study is to enhance the delivery of service in an effective and efficient manner by employing BIM applications within the QS practice in Sri Lanka where the objectives are to discover the current state of usage of BIM application in the Quantity Surveying field, to analyse the barriers influencing the implementation of BIM, to determine strategies to encourage the use of BIM to escalate the effectiveness and efficiency within the Quantity Surveying operations in Sri Lanka.

Methodology

For this research, Pragmatism is the most suitable type of research philosophy because this study starts with a problem and tries to provide practical solutions that can be used in the future practice (Saunders et al., 2009). This research can be referred to as a Descriptive Research due to the wide range of surveys and fact-gathering inquiries, describing the current situation of the issues is the most essential goal (Kothari, 2004). Mix method is used as the research approach of this study where it combines both quantitative and qualitative methods (George, 2021). Surveys with closed-ended questions, observations where numbers are recorded, experiments and secondary data are comprised in this study where quantitative data are present.

In this study, qualitative data are included in literature reviews that evaluate concepts and theories and observations articulated in words, interviews with open-ended questions, focus groups, and secondary data.

For this research study, the questionnaire was distributed among randomly selected 45 Quantity Surveyors and purposively selected 5 Charted QS were interviewed among the population. The data collection methods used for conducting this research are listed below. Literature survey, which was undertaken to establish the research problem background and to obtain a solution to the research problem by articulating the objectives to be pursued. Close- ended questionnaires were utilized in this study as they included predetermined answers and required less time to complete. Structural interview survey was used to ask professionals' opinions regarding this study with pre-decided interview questions based on the requirement for the study. The responses compiled from the questionnaire were analysed using RII (Relative Importance Index) method, correlation analysis and regression analysis which are based on the hypothesis. Hypothesis was constructed based on dependent and independent variables of the study and firstly the reliability and validity of the questions in the questionnaire was identified. The interviewees' opinions were analysed by content analysis.

Results and Discussion

The questionnaire distributed was responded by 45 Quantity Surveyors. Among the 45 Quantity Surveyors, 4 Charted QS, 21 Senior QS and 20 Assistant QS responded the questionnaire. Both the Pearson's correlation analysis and regression analysis showed that the relationship between independent and dependent variables are strong.

A. Current State of using BIM within the QS practice

Most of the Sri Lankan construction organizations still uses manual methods in the QS practice, usage of standalone practice is high in Sri Lanka, and Architect is not formulating the BIM process and though sufficient details are available at design development stage, manual methods are used by QS to carry out their tasks vague through the detailed questionnaire. These indicate that Sri Lanka is a BIM infant country and lies in Level 0 of Bew- Richard model.

B. Barriers to implement BIM within the QS practice

In the construction industry, according to the responses given by professionals regarding barriers to use BIM in the QS practice, lack of government influence (BA6) is the most significant hindrance of executing BIM within the QS practice of Sri Lanka. According to the content analysis results, unavailability of efficient computers, continuous power supply, continuous internet supply was identified as hindrances to implement BIM within the QS practice.

C. Strategies to encourage the use of BIM within the QS practice

When considering the overall summary of the factors which act as strategies to encourage the use of BIM within the QS practice, it is essential to identify the most significant strategy as it brings numerous benefits to implement BIM to the QS practice of Sri Lanka. Thus, according to this study, the most significant strategy is government imposing regulations and develop the National BIM standard and National BIM execution plan while the least impacted strategy is addition of BIM as a compulsory module. According to the content analysis results, addition of practical sessions on QS related BIM software, was suggested as a strategy to implement BIM within the QS practice.

Conclusion and Recommendations

This research study was directed to promote BIM within the QS practice. Literature surveys from past research findings and a detailed questionnaire survey were conveyed to ascertain the present state of using BIM, identify the barriers and strategies. A semi structured interview survey was conducted along with the attempt to gather the perspectives of the professionals in the field of QS to govern the contemporary status of using BIM and to elaborate the most significant barrier and strategy that encourage the use of BIM within the QS practice of Sri Lanka. To accomplish the three prominent objectives, Pearson's correlation analysis, regression analysis and RII were used along with content analysis to analyse the findings.

Over the recent years in the new millennium of the QS practice, it is evident that the BIM has extended to a remarkable popularity and in general, BIM was increasingly recognized worldwide. According to the Bew-Richards BIM maturity model, Sri Lankan QS practice lies in the 'Level 0' as still conventional manual methods are being used by Quantity Surveyors. Thus, Sri Lanka can be considered as a BIM infant country. The findings concluded that the integration of BIM in QS practice is very low. According to the RII analysis, the most significant barrier that hinders the adoption of BIM is lack of government influence. The opinions of interviewees too concluded that the major hindrance is the lack of government influence.

Through a thorough literature review, strategies to encourage the use of BIM within the QS practice were distinguished, and the responses of the questionnaires were ranked using the RII method to determine the most significant strategy that is used to promote the incorporation of BIM. Government imposing regulations and developing the National BIM guidelines and action plan obtained the highest ranking. The interviewees proposed that BIM should be standardized and the knowledge on BIM protocols should be shared among the QS professionals to enhance the usage of BIM within the Sri Lankan QS practice.

Recommendations were proposed through a deep analysis, according to the overall outcomes of this study. The base for the recommendations is the past research outcomes and the recommendations gained through the experts when carrying out the interview.

The interviewees recommended conducting practical sessions on QS based applications related to BIM, high-capacity machines should be available along with continuous internet supply as the entire country covers and power supply. Through the detailed questionnaire survey, it was recommended that realizing the merits and value of BIM, the government should pave the path to adopt BIM by imposing rules and regulations, policies, action plans, standards and using BIM in their projects and make application of BIM compulsory in all construction projects, which will facilitate to employ BIM rapidly within the QS practice of Sri Lanka.

References

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