Enhancing Building Information Management Adoption in Design Consultant Companies in Malaysia: A Conceptual Study

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ABSTRACT

The implementation of a Building Information Modelling (BIM) system has been acknowledged to offer numerous advantages to a design consultancy organization. Nevertheless, an examination of a readiness study on design consultant firms regarding the implementation of BIM System reveals a negligible adoption rate within the industry. Therefore, further endeavors are necessary to promote a more widespread utilization of BIM. The objective of this research is to encourage the extensive implementation of BIM in the consultant organization. The research objective is to investigate the potential benefits of implementing a BIM system in consultant businesses for project design. In order to accomplish research objectives, a theoretical framework is suggested, drawing upon the findings of the review. This framework will thereafter be employed to design the questionnaire for gathering data. A questionnaire survey is employed to gather data for this investigation. In this study, the quantitative research approach model was employed for objective analysis. Each technique is evaluated using a five-point Likert scale, which enables respondents to assess the effectiveness of the strategy in relation to its significance. Upon completion of the research, the findings of this study indicate that the actual outcome aligns closely with the anticipated outcome. Specifically, the deployment of BIM systems among firm consultants in Malaysia remains relatively low, although it demonstrates greater effectiveness in terms of design assistance and constructability. It is expected that the information presented in this thesis will inspire firm consultants to incorporate BIM technologies in their upcoming projects.

Keywords: Building Information Management, Technology Management, Design Consultant, Malaysia

INTRODUCTION

The system plays a vital role in the consultancy companies, as it is essential for maintaining and advancing society in various aspects. The use of innovations would lead to enhanced efficiency, reduced expenses, and elevated health and safety standards (A. K. D. Wong et al., 2011). Some literature argues that utilizing systems, particularly the development of digital models, offers a more effective approach to evaluating potential issues, such as hazards at the construction site. The solution facilitates the creation of a very accurate guaranteeing method and pricing policy that is customized to the client's operation. Consulting companies are experiencing a growing popularity of Buildings Information Modelling (BIM). BIM has been hailed as a pivotal point in the journey towards digitalization. The consultancy company has recognized it as the preferred platform for a variety of benefits (Munir et al., 2020; Radzi et al., 2024).

The utilization of information technology in the consulting firm has significantly enhanced during the past three decades (Fisher et al., 2006). Building Information Modelling (BIM) is considered the most advanced and promising technology among these options. A Building Information Modelling (BIM) system is a

technological tool that facilitates the storing and retrieval of information and domain expertise over the duration of a project. The primary duty of the BIM system is to oversee and merge the transfer of information and knowledge among different fields and stages of the project.

Implementing a BIM system in a design consultancy project can enhance the quality of the result and facilitate the development of highly sustainable construction plans. The recognition of the economic and environmental advantages of BIM in the near future, as highlighted by various studies (Doan et al., 2021; K. din Wong & Fan, 2013), has not led to a rapid adoption of this innovative technology. This research aims to propose a conceptual understanding of the obstacles that hinder the use of BIM in the consulting organization.

LITERATURE REVIEW

Currently, there exist multiple interpretations of BIM. Several definitions of building information modelling prioritize the model and its associated data. BIM is a digital representation of a building that follows an object-oriented, architecture engineering approach. It facilitates the exchange and interoperability of information. The concept of BIM is subsequently presented. BIM focuses on the generation, utilization, and upkeep of digital data for the seamless coordination of building design, construction, and maintenance. According to international standards, BIM is defined as a "shared digital representation of the physical and functional characteristics of any constructed entity that provides a reliable basis for decision-making." For the purposes of this study, BIM is defined as a cohesive set of interconnected regulations, protocols, and technologies Figure 1 that generate a framework for overseeing essential architectural designs and project information in a digital format over the entire lifespan of a building.

It is important to highlight that, from a technical perspective, the implementation of BIM has improved the involvement of project stakeholders, minimised errors and adjustments in the field of study, and created a more efficient and dependable delivery method that reduces costs and saves time throughout the entire lifespan of construction projects. This statement is endorsing the public sector's dedication to enhancing service delivery through the utilisation of advanced knowledge and technology.

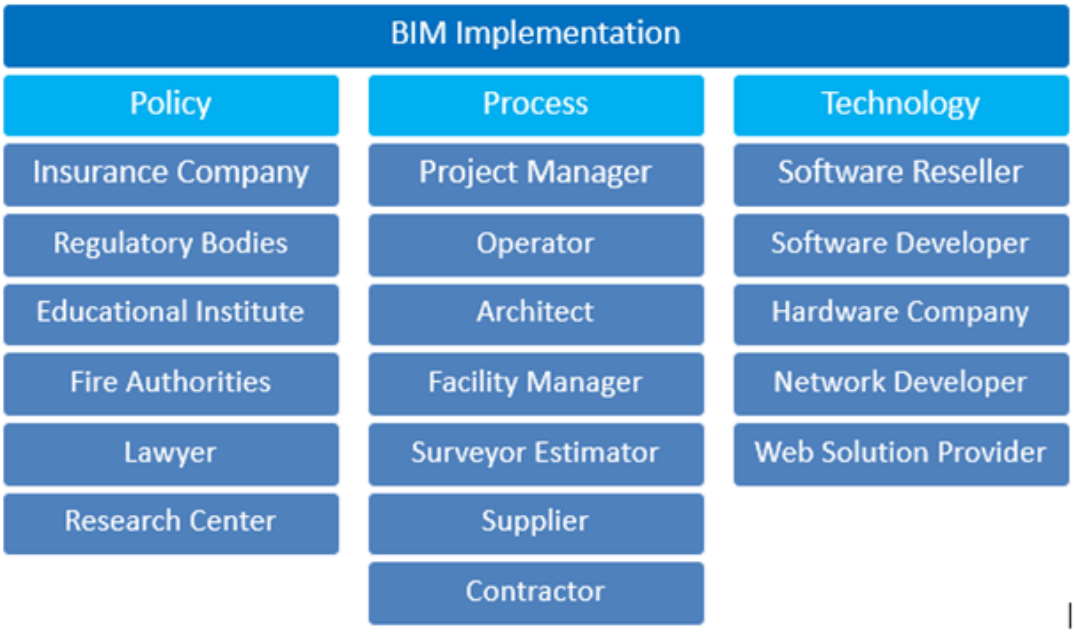

Fig. 1 Building Information Management Implementation strategy

A BIM model is a comprehensive database that contains all the necessary information for effectively managing many operations, including logistics, building construction and operation, facilities, and civil tasks. Essentially, the model delineates, simulates, and sustains project design and life cycle through digital

tools (Wong et al., 2010). The primary goal of BIM is to improve project performance and get superior results by utilising a unified and accurate source of information.

BIM is more than simply a programme; it is a methodology for obtaining information about a consultant company's project during the design and pre-construction stages. BIM is a tool for utilising and disseminating knowledge. The BIM process is a recent construction concept that involves the collecting of information during the construction process (Shahhosseini et al., 2014). In the construction business, new advancements in BIM have introduced the use of multi-dimensional information, resulting in extra value for the project. The utilisation of BIM in this industry can demonstrate its application by facilitating systematic classification and evaluation, which are among its advantages.

Implementing BIM in Malaysia has the potential to greatly improve construction efficiency and productivity. Through the utilisation of Building Information Modelling (BIM) technology, stakeholders within the construction sector can optimise and simplify a range of activities, including design, planning, and construction management (Munir et al., 2020). BIM facilitates instantaneous cooperation among architects, engineers, contractors, and other stakeholders engaged in the construction process, thereby minimising errors, conflicts, and delays. The enhanced efficiency results in reduced project durations and financial savings, ultimately benefiting both the construction sector and the overall economy. Based on the literature review, the following proposition have been developed

P_1: BIM significantly have a positive impact towards construction efficiency

While the BIM are assumed to have a significant impact towards efficiency, it also have a potential in increasing the building lifecycle. BIM enables more effective oversight of the complete building life cycle, encompassing the stages of design, construction, operation, and maintenance (Georgiadou, 2019; Radzi et al., 2024; A. K. D. Wong et al., 2011). In Malaysia, where there is a growing emphasis on sustainable development and effective resource utilisation, BIM may have a significant impact on improving building performance and minimising environmental harm. BIM facilitates informed decision-making throughout a building's lifespan by offering precise and comprehensive data on building components, materials, and systems. This leads to enhanced sustainability, energy efficiency, and long-term cost reductions. Thus, the following proposition are developed

P_2: BIM significantly have a positive impact towards construction building lifecycle

The current state of the Consultant company and its level of readiness to adopt the BIM system varied greatly. Consequently, diverse strategies may be required in different regions to encourage the utilisation of BIM systems. In addition to regional and cultural factors, the extent to which companies implement BIM systems differs. The initial phase of adopting the BIM system resulted in several learning opportunities and experiences. The literature also included recommendations based on this phase. The adoption of BIM systems is a crucial occurrence in the spread of BIM systems and the understanding of implementation challenges. Several influential factors impact the adoption of BIM, prompting numerous studies to investigate strategies for promoting BIM adoption at both national and organisational levels. The study of BIM adoption is significant as it examines both universal concerns and cultural elements that impact the efficiency of BIM system implementation (Santos et al., 2017).

METHODOLOGY

BIM system facilitates the development of three-dimensional modelling to be employed throughout the facility's planning, design, construction, and management phases. All potential preparedness will be enumerated, and the successful execution has consistently guaranteed the attainment of advantages and the contrary outcome. Consequently, the advantages of BIM systems should convince professionals in the consulting industry to implement BIM systems in their companies. This study proposes a significant

framework between the benefits of BIM systems and the application of BIM, which could have an impact on Malaysian corporate consultants.

The development of a conceptual framework is an essential and crucial phase in this research, which involves meticulous preparation, theoretical foundation, and iterative improvement. By identifying crucial concepts, examining relationships, and applying the framework in research, academics can generate robust and influential studies that enhance knowledge in the implementation of BIM in the construction industry.

CONCLUSION AND RECOMMENDATION

Introducing BIM into Malaysian construction firms offers both prospects and obstacles. BIM has the capacity to transform the construction sector in Malaysia through fostering collaboration, promoting project efficiency, cutting costs, and minimizing errors. Implementing BIM enables enhanced visualization, simulation, and analysis, resulting in more informed decision-making at every stage of the project's lifespan. Nevertheless, the adoption of BIM is not without challenges. Malaysian construction firms encounter obstacles such as substantial upfront expenses, the requirement for proficient staff, reluctance to adapt, and the absence of uniform rules and policies.

Notwithstanding these obstacles, the advantages of BIM surpass the constraints, and its implementation is essential for the Malaysian construction sector to maintain competitiveness internationally. As the awareness of the benefits of BIM grows among enterprises in Malaysia, the building industry will eventually overcome these obstacles, resulting in a more streamlined and environmentally friendly construction environment.

In order to encourage the implementation of BIM in the building industry in Malaysia, it is imperative for the government to establish unambiguous directives and offer monetary incentives. Allocating resources to education and training is essential in order to effectively tackle the disparity between the abilities required and those possessed by individuals. Furthermore, fostering industry collaboration to establish standardised practices and adopting a progressive implementation strategy can assist firms in efficiently incorporating BIM into their operations.

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