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Short Communications

Identifying the Key Barriers in Adoption of BIM for Building Surveyor Professional in Malaysia: Bridging the Knowledge Gap

Farahniesa Raman[1], Siti Hamidah Husain[*,1]

[1] Department of Building Surveying, School of Housing, Building and Planning, Universiti Sains Malaysia, 11800, Penang, Malaysia

[*] **Correspondence email:** sitihamidahhusain@usm.my

Abstract

Building Information Modelling (BIM) holds immense potential to revolutionise the construction industry by improving visualisation, collaboration, and data management throughout the building lifecycle. However, BIM adoption remains slow among building surveyors in Malaysia, mainly due to technological, educational, and organisational barriers. This paper aims to identify the key barriers to BIM adoption, using a systematic literature review. The results highlight that technological costs, lack of training, cultural resistance, limited collaboration, and the absence of standardised processes are significant obstacles. Addressing these challenges requires industry and educational institutions' collaboration, better training opportunities, and policy reforms. The findings of this research provide a foundation for future strategies to improve BIM adoption, ensuring enhanced project efficiency, compliance, and digital transformation in Malaysia's construction industry.

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1. Introduction

This research focuses on identifying the key barriers to adopting Building Information Modelling (BIM) among building surveyors in Malaysia. BIM has been recognised globally as a transformative tool that can significantly enhance construction projects' efficiency, accuracy, and collaboration [1]. By providing a comprehensive digital representation of a building's physical and functional characteristics, BIM allows stakeholders to visualise, simulate, and manage the entire lifecycle of a project. Despite its widespread use in countries such as the United Kingdom and the United States, the adoption of BIM in Malaysia, particularly among building surveyors, has been slow and uneven [2].

Building surveyors play a crucial role in the construction process, ensuring that projects comply with legal, regulatory, and safety standards. Integrating BIM into building surveying workflows could streamline processes, reduce errors, and improve regulatory compliance. However, surveyors face multiple barriers in adopting this technology, ranging from high software costs and insufficient training to cultural resistance within organisations [3]. These challenges are further compounded by a lack of standardised protocols and inadequate collaboration between educational institutions and the construction industry, leading to inconsistent BIM uptake [2].

This study aims to bridge the knowledge gap by investigating the challenges building surveyors face in adopting BIM. By focusing on these barriers, the research will contribute to the broader discourse on technology adoption in the construction industry, providing actionable recommendations to enhance BIM uptake among building surveyors in Malaysia. The following sections will present the research background, literature review, methodology, and findings that provide insights into the current state of BIM adoption and the steps necessary to overcome existing obstacles.

2. Literature Review

2.1. Knowledge Gap in BIM Implementation in Building Surveying Services

Building Information Modelling (BIM) has emerged as a transformative tool in the global construction industry, enabling stakeholders to visualise, simulate, and manage a building's physical and functional characteristics in a digital environment. BIM offers substantial benefits across the project lifecycle, from the design phase to post-construction management, by improving collaboration, reducing errors, and enhancing data-driven decision-making [1]. With BIM, all project participants, including architects, engineers, contractors, and building surveyors, can work on a shared platform, allowing for real-time updates and enhanced coordination, thus significantly reducing project delivery times and costs [4].

In countries such as the United Kingdom (UK), where government mandates have supported BIM adoption, it has proven to yield productivity improvements of up to 20% in public sector construction projects [5]. BIM Level 2, mandated by the UK government for all public sector projects in 2016, has catalysed widespread industry adoption, leading to improved compliance, greater transparency, and better project outcomes [6]. Similarly, in the United States and other developed nations, BIM adoption has gained traction due to the robust government and industry support, which recognises digital technologies' efficiency and sustainability benefits to construction [7].

However, despite the advantages demonstrated in these regions, BIM adoption in Malaysia has been comparatively slow, particularly among building surveyors, who play a crucial role in ensuring that construction projects comply with legal, safety, and regulatory standards [2]. Building surveyors are responsible for monitoring the quality of construction, verifying compliance with building regulations, and conducting inspections throughout the building lifecycle. By leveraging BIM, surveyors could streamline these processes, making them more efficient and accurate [8]. For instance, BIM can facilitate digital inspections, allowing surveyors to identify potential regulatory issues early in the design stage, which can reduce rework and improve compliance.

The slow adoption of BIM among building surveyors in Malaysia can be attributed to several factors. Firstly, significant technological barriers are associated with the high costs of BIM software, hardware, and infrastructure upgrades. Smaller firms face financial constraints that hinder their ability to invest in these digital tools [9]. Additionally, educational barriers exist, as BIM training is not sufficiently integrated into university curricula or continuing professional development programs for surveyors [2]. As a result, many surveyors lack the technical expertise required to implement BIM in their workflows, leaving a knowledge gap that impedes the technology's full potential in the profession.

Furthermore, many Malaysian organisations experience cultural resistance to adopting new technologies. Professionals accustomed to traditional practices may be reluctant to embrace BIM, as the transition from manual methods to digital workflows requires significant changes in mindset and organisational processes [10]. This resistance is compounded by a lack of leadership initiatives that encourage innovation and foster a culture of digital transformation within firms [11].

Another key barrier is Malaysia's construction industry's lack of standardised BIM protocols. Without clear guidelines or government-mandated requirements, there is a fragmented approach to BIM adoption across different firms and projects [12]. While the Malaysian government has introduced the Malaysian BIM Roadmap (2020-2025) to promote BIM adoption, its voluntary nature means that uptake remains inconsistent. This has led to a situation where the use of BIM is often limited to larger projects and firms, with smaller organisations struggling to adopt the technology effectively [2].

Building surveyors face unique challenges in adopting BIM, as their traditional methods rely heavily on manual data collection, paper-based processes, and on-site inspections. By transitioning to BIM, surveyors could automate many tasks, improve accuracy and reduce the time spent on compliance checks and documentation [8]. However, for this transition to occur, surveyors must first overcome the barriers related to training, cost, and organisational resistance.

Given the critical role that building surveyors play in ensuring the quality and safety of construction projects, it is essential to address these barriers to BIM adoption. By identifying the key obstacles and proposing strategies to overcome them, this research aims to bridge the knowledge gap and promote the widespread adoption of BIM among surveyors in Malaysia. Doing so can help modernise the construction industry, improve regulatory compliance, and enhance the overall efficiency of construction projects in the country [13].

2.2. BIM Adoption in Malaysia

In Malaysia, the adoption of BIM in the construction industry has been slower than in other countries. While the Malaysian government has introduced initiatives like the BIM Roadmap, which outlines a strategy for promoting BIM adoption, the uptake has been limited due to various challenges. These include the high costs of BIM software and hardware, the lack of interoperability between BIM platforms, and the limited availability of skilled professionals [14]. The lack of mandatory policies for BIM adoption, especially in the private sector, has also contributed to its slow integration [2]. Al-Ashmori et al.'s study [15] found that a majority of participants in the construction industry are not informed about the potential benefits of BIM technology, and most construction companies have limited awareness of this technology. Wang et al. [16] argue that the implementation of building BIM in many construction projects has failed to achieve expected benefits due to user resistance. Despite the many barriers to BIM implementation, there is no doubt about the benefits offered by these BIM technologies, such as helping in enhancing the design visualisation, providing better data sharing and exchanges, reducing construction waste, and improving building performance, safety and productivity [17,18].

2.3. BIM in Building Surveying

Building surveyors ensure that construction projects comply with building codes and regulatory standards. BIM offers a digital platform that can streamline the inspection and compliance check processes, allowing surveyors to detect design and construction errors early. However, BIM adoption in building surveying has been slow, primarily due to insufficient training and a lack of awareness of its benefits [3]. Surveyors who successfully adopt BIM can improve the quality and efficiency of their inspections, ensuring better compliance with regulatory standards [8].

2.4. The Role of the Building Surveyor in BIM Adoption

Building surveyors can facilitate BIM adoption by ensuring BIM tools are used to improve compliance and reduce errors. By integrating BIM into their workflows, surveyors can enhance communication with other professionals, such as architects and contractors, and streamline project monitoring and inspections [13]. The role of surveyors in adopting BIM is crucial for ensuring that the construction industry moves toward a more digital, efficient, and collaborative future.

2.5. Barriers to BIM Adoption in Building Surveying

The primary barriers to BIM adoption in building surveying include high software costs, a lack of technical expertise, and resistance to changing traditional methods. In the separate study, cost and standards, process and economics, technology and business, and training and people are the key barriers affecting BIM implementation in the construction industry [19]. Many building surveyors are unfamiliar with BIM tools and processes, which creates a significant barrier to adoption [10]. In addition, there is a lack of standardised protocols for BIM usage within the Malaysian construction industry, which further complicates the integration of BIM into daily surveying practices [12]. Furthermore, industry's resistance to change from traditional working practices, lack of understanding of the processes and working procedure for BIM and sustainability development, and a long period of adaptation to innovative technology are the additional associated barriers in BIM adoption [20]. Addressing these barriers will require a concerted effort from educational institutions, industry professionals, and the government to provide the necessary resources and support for BIM adoption.

3. Methodology

3.1. Research Design Framework

This study employs a qualitative approach through a critical literature review, analysing existing research and case studies on BIM adoption within the building surveying profession. The review identifies the key barriers to BIM adoption and proposes strategies for overcoming them. Additionally, this study follows a three-stage research design:

1. Critical literature review to synthesise the current knowledge on BIM adoption barriers.
2. Qualitative data collection through face-to-face interviews with industry professionals and surveyors.
3. Open-ended questionnaires to gather in-depth insights from key stakeholders, including educators and industry experts.

3.2. Data Collection Methods

The critical literature review thoroughly examines journal articles, industry reports, government publications, and conference papers from 2019 to 2025. This method allows for an in-depth understanding of current challenges and identifying recurring themes in BIM adoption barriers.

3.2.1. Critical Literature Review

The review is organised around key thematic areas, including technological challenges, training and education gaps, financial constraints, and organisational resistance. By analysing a wide range of sources, the review aims to comprehensively understand the factors hindering BIM adoption among building surveyors.

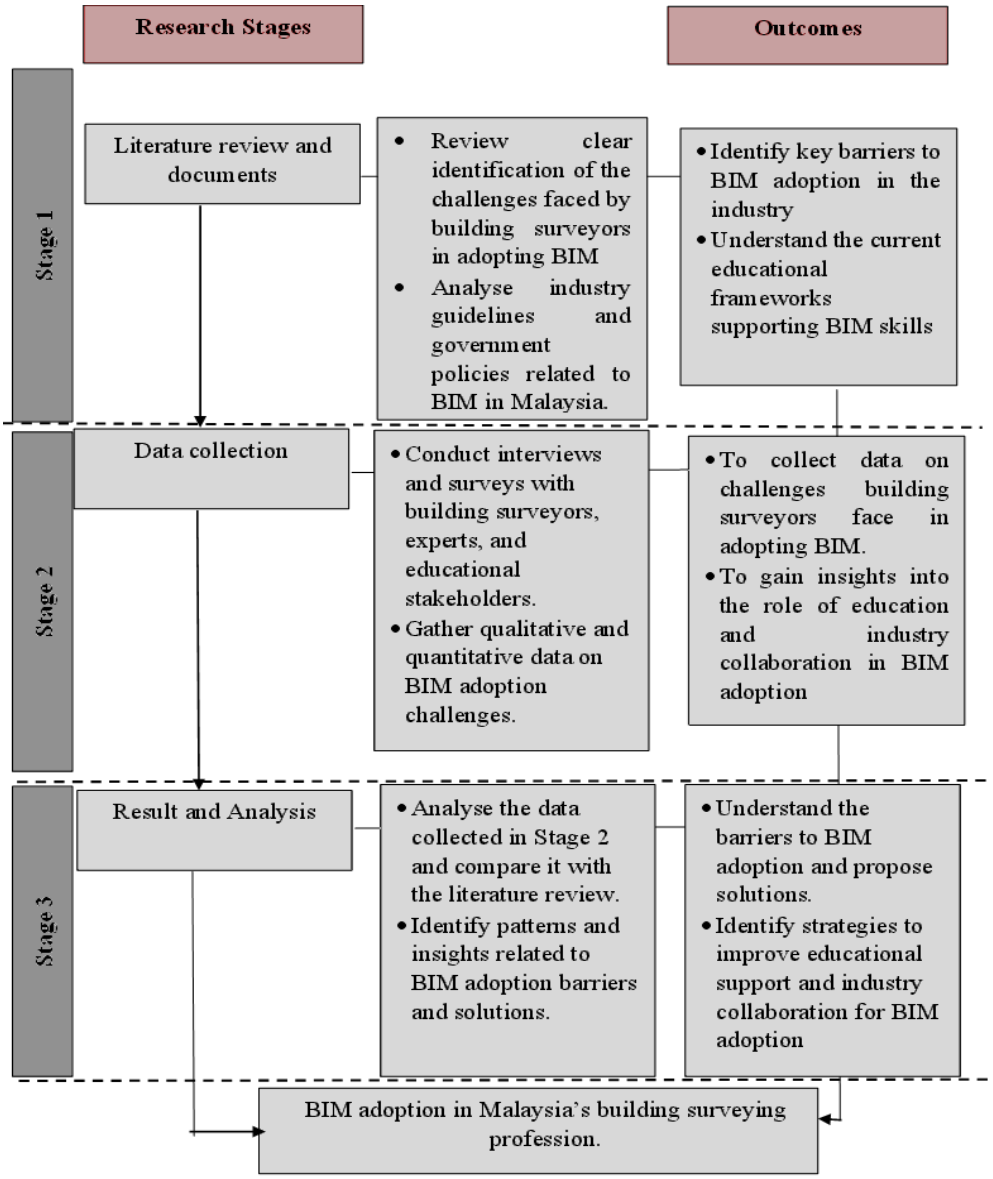

Figure 1: Research Design Framework.

4. Results

Table 1 summarises the barriers to adopting BIM among Building Surveyors. It also presents information and outlines of potential solutions that can be adopted at both institutional and organisational levels.

Table 1: Guiding Framework for Linking BIM Adoption in Building Surveying Industry.

Barrier	Description	Proposed Solutions
High Cost of BIM Software	The high cost of acquiring and maintaining BIM software, as well as additional cost for specialized training, are the significant barrier, particularly for Small and Medium Enterprises (SMEs) [2,8,9,19].	Government subsidies or tax incentives to lower costs [2].

Lack of Technical Expertise	Many building surveyors lack the necessary technical skills to use BIM tools [8,9,19] effectively	Increased BIM-focused training and inclusion in academic curricula [11].
Resistance to Change	Organisational cultural resistance slows the transition from traditional to digital workflows [2,4,10,20].	Awareness programs and leadership support to foster a culture of innovation [10].
Limited Collaboration	Weak collaboration between industry and educational institutions hinders skill development [8,10].	Strengthening partnerships through joint training initiatives [13].
Lack of standardization and interoperability between BIM platforms	The data cannot be seamlessly transferred between platforms, creating inefficiencies and increasing the risk of errors, because the different BIM tools are not always compatible with each other, posing a significant challenge [2,5,8,20].	All stakeholders need to be able to work on the same platform with standardised processes, but the current lack of interoperability continues to be a major obstacle to achieving this [1].

5. Conclusion

In conclusion, the adoption of BIM among building surveyors in Malaysia faces several critical barriers, including the high cost of software, lack of technical expertise, resistance to change, and insufficient collaboration between educational institutions and the industry. Addressing these barriers requires a multifaceted approach. First, financial incentives and subsidies could reduce the cost burden on small and medium enterprises. Second, educational institutions must integrate BIM training into their curricula to prepare future surveyors for digital workflows. Third, fostering a culture of innovation within organizations is essential for overcoming resistance to change. Finally, stronger collaboration between industry and academia will be key to ensuring that building surveyors receive the necessary support to adopt BIM effectively. By tackling these challenges, the construction industry in Malaysia can leverage BIM to enhance regulatory compliance and improve project outcomes.

Declaration of Conflict of Interest

The authors declared no conflict of interest with any other party on the publication of the current work.

ORCID

Siti Hamidah Husain https://orcid.org/0000-0001-7091-8544

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