Chapter 4
Analytic Hierarchy Progress (AHP) for Construction Technologies Adoption in the Malaysian Construction Industry

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ABSTRACT

Digital technologies are vital for boosting productivity and efficiency in Malaysia's construction industry. Despite a 74% awareness rate of Building Information Modeling (BIM) reported in the Malaysia BIM Report 2019, adoption remains limited. This study employs a quantitative methodology, using questionnaire surveys to assess the need for technology adoption among industry players. The findings

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aim to inform the development of a decision-making tool for selecting suitable technologies for construction projects. By identifying key challenges arising from limited digital adoption, the research proposes strategies to enhance technology integration. Expected outcomes include improved project outcomes, reduced cost overruns, minimized delays, and enhanced industry productivity. Ultimately, these advancements will contribute to Malaysia's GDP growth while addressing critical inefficiencies in the construction sector. Promoting digital adoption is essential for elevating the industry's performance and ensuring its long-term sustainability.

INTRODUCTION

The Construction 4.0 Strategic Plan (2021–2025), developed by CIDB through the Construction Research Institute of Malaysia (CREAM), highlights twelve key technologies capable of transforming Malaysia's construction companies into technologically advanced entities. These technologies have demonstrated effectiveness in addressing major industry challenges and delivering tangible benefits to stakeholders (Subramaniam et al., 2020; CIDB Malaysia, 2022).

Traditional construction practices in the industry are often characterized by inefficiencies such as cost overruns, schedule delays, and quality issues (Zimmermann, 2023). Fragmented processes and a heavy reliance on manual methods contribute to low productivity and waste (CIDB, 2023). In contrast, the integrated use of advanced technologies offers a path to overcome these challenges by streamlining workflows and improving accuracy. For instance, Building Information Modeling (BIM) enables better coordination and clash detection, prefabrication techniques reduce material waste and speed up assembly, and digital project management platforms facilitate real-time communication and decision-making (ProjectTeam, 2023). By combining such tools, construction projects can achieve higher efficiency, improved safety, and greater sustainability.

Despite the proven effectiveness of these technologies in addressing industry challenges (Subramaniam et al., 2020), adoption rates among Malaysian AEC (Architects, Engineers, and Consultants) firms remain suboptimal, with fewer than 40% implementing digital tools. This reluctance stems from uncertainties such as resistance to changing conventional methods, difficulties in integrating new systems, and a lack of decision-support frameworks (Meor Gheda et al., 2025; Nnaji & Karakhan, 2020). The gap between the proven benefits of Construction 4.0 technologies and their limited uptake highlights the need for effective decision-making aids to guide practitioners in selecting and implementing innovations.

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