

Building Information Modelling: A Solution to the Limitations of Prefabricated Construction

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Abstract : The construction industry plays a vital role in the global economy, contributing billions of dollars annually. However, the industry has been struggling with persistently low productivity levels for years, unlike other sectors that have shown significant improvements. Modular and prefabricated construction methods have been identified as potential solutions to boost productivity in the construction industry. These methods offer time advantages over traditional construction methods. Despite their potential benefits, modular and prefabricated construction face hindrances and limitations that are not present in traditional building systems. Building information modelling (BIM) has the potential to address some of these hindrances, but barriers are preventing its widespread adoption in the construction industry. This research aims to enhance understanding of the shortcomings of modular and prefabricated building systems and develop BIM-based solutions to alleviate or eliminate these hindrances. The research objectives include identifying and analysing key issues hindering the use of modular and prefabricated building systems, investigating the current state of BIM adoption in the construction industry and factors affecting its successful implementation, proposing BIM-based solutions to address the issues associated with modular and prefabricated building systems, and assessing the effectiveness of the developed solutions in removing barriers to their use. The research methodology involves conducting a critical literature review to identify the key issues and challenges in modular and prefabricated construction and BIM adoption. Additionally, an online questionnaire will be used to collect primary data from construction industry professionals, allowing for feedback and evaluation of the proposed BIM-based solutions. The data collected will be analysed to evaluate the effectiveness of the solutions and their potential impact on the adoption of modular and prefabricated building systems. The main findings of the research indicate that the identified issues from the literature review align with the opinions of industry professionals, and the proposed BIM-based solutions are considered effective in addressing the challenges associated with modular and prefabricated construction. However, the research has limitations, such as a small sample size and the need to assess the feasibility of implementing the proposed solutions. In conclusion, this research contributes to enhancing the understanding of modular and prefabricated building systems' limitations and proposes BIM-based solutions to overcome these limitations. The findings are valuable to construction industry professionals and BIM software developers, providing insights into the challenges and potential solutions for implementing modular and prefabricated construction systems in future projects. Further research should focus on addressing the limitations and assessing the feasibility of implementing the proposed solutions from technical and legal perspectives.

Keywords : building information modelling, modularisation, prefabrication, technology

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