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Advancements in Building Deconstruction: Examining the role of drone technology and building information modelling

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Abstract

Deconstructing a building with the help of drones and BIM (building information modelling) is becoming increasingly common as a more efficient, eco-friendly, and affordable alternative to the traditional techniques of building disassembly. This paper presents a systematic review following the methodology of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to investigate the role of drone technology and BIM in building deconstruction. A total of 10 studies were identified based on the integration of drone technology with BIM, all of which proved promising in enhancing the process of building deconstruction. The analysis of the 35 and 3 non-academic selected data reveals several key findings. Firstly, BIM is not commonly used in deconstruction or demolition processes, particularly in managing fixtures and fittings of buildings. Secondly, the adoption of deconstruction-oriented design methods and the use of drone technology can significantly reduce the negative environmental impacts of building demolition waste. Lastly, the limited implementation of design for deconstruction practices in the construction industry hinders the realisation of environmental, social, and economic benefits associated with this approach. Overall, this systematic review highlights the potential of drone technology and BIM in improving building deconstruction practices, while also identifying knowledge gaps and areas for further research and development on this topic.

Keywords: building deconstruction, drone technology, building information modelling (BIM), environmental impact, sustainable construction