

# Building information modeling (BIM) in green buildings: a state-of-the-art bibliometric review

BIM in green buildings

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## Abstract

**Purpose** – This study evaluates the knowledge structure of building information modeling (BIM) in green buildings. Buildings are one of the main contributors to carbon emissions, and implementing BIM in green buildings is seen as an indispensable approach to mitigate environmental and climate change issues.

**Design/methodology/approach** – Through a bibliometric analysis, 297 publications retrieved from the Web of Science (WoS) were analyzed to explore their intellectual structure.

**Findings** – Bibliographic coupling analysis produced four clusters on current and emerging trends, while co-word analysis produced four clusters on future BIM and green building trends. Current and emerging trends revolve around BIM adoption in green and existing buildings, life cycle analysis (LCA) and sustainable rating tools. Future trends related to BIM and performance analysis and optimization, the BIM framework for green building design and construction, overcoming barriers and maximizing benefits in BIM adoption.

**Research limitations/implications** – The implications of this study are relevant to all BIM and green building stakeholders, including developers, engineers, architects, occupants, tenants and the whole community.

**Originality/value** – This study examines the crucial integration of BIM and green building within the more extensive construction and building field scope.

**Keywords** Building information modeling, Green building, Sustainable building, Building rating, Bibliometric analysis

**Paper type** Literature review

## 1. Introduction

Building sectors are responsible for up to 40% of energy consumption and 36% of carbon dioxide emissions globally (Islam *et al.*, 2022). To mitigate the impact of building on the environment, developers and architects have introduced green buildings or sustainable buildings for new design construction and existing buildings. Green building has become a concept that promotes health, energy saving and safety of construction buildings (Chi *et al.*, 2020). It is meant to protect the environment, reduce resource depletion and dampen the impact of pollution during the building lifecycle (Guo *et al.*, 2021). It has less environmental



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