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Master Thesis Defense

Entitled

INVESTIGATING BIM APPLICATIONS IN REDUCING CO2 EMISSIONS IN THE BUILT ENVIRONMENT

By

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Abstract

Large amounts of CO2 are released into the atmosphere throughout the life cycle of a building starting from the production of materials and products, in the construction phase of the building itself, in the site setting, the renovations, the later rehabilitation, and up to the final demolition. Hence, this thesis aims to investigate the potential of using Building Information Modeling (BIM) in making informed decisions that can help in reducing CO2 emissions in the life cycle of built environment projects. This study has used a mixed method approach that include literature review, a case study and semi-structured interviews. The literature investigates the related various applications of BIM, its barriers, challenges, and underlying benefits, as well as its ability to reduce CO2 emissions through smart design decisions. Also, a case study is used to validate BIM's ability to calculate a building's CO2 emissions. Additionally, semi-structured interviews were conducted with construction professionals to capture their viewpoints on the possible contributions of BIM to CO2 emission reduction in the construction sector. The research outcomes are presented through data analysis from the BIM model, supported by insights obtained by interviews. This integrated approach combines theoretical insights from the literature with practical applications and specialist feedback to provide a thorough understanding of BIM's essential contribution in tackling the need of CO2 emission reduction in the construction sector. This research is anticipated to act as a catalyst for sustainable decision-making in the construction sector.

Keywords: CO2 emissions, Building Information Modeling, life cycle, built environment.