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Master Thesis Defense

Entitled

ASSESSING ASSET MANAGEMENT IN AEC/FM: UNVEILING LIMITATIONS AND ADVANCING SOLUTIONS WITH DIGITAL TWIN

by

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Abstract

In recent years, the concept of Digital Twins (DTs) has emerged as a transformative technological innovation with the potential to revolutionize asset management practices. A Digital Twin is a digital representation closely linked to a physical entity, enabling bidirectional information exchange and data-driven decision-making. Within the realm of Architecture, Engineering, and Construction/Facilities Management (AEC/FM), DTs offer a diverse array of applications for enhancing asset management.

This thesis aims to demystify the concept of DTs and explore their existing applications in asset management, particularly within the AEC/FM industry. To achieve this, the research employs a two-fold approach: a systematic review of existing literature followed by structured interviews with FM professionals.

The systematic literature review revealed that the construction processes of DTs are still in their nascent stages. However, it unveiled a multitude of potential applications for DTs across the entire lifecycle of assets. These applications encompass sustainable retrofitting, predictive maintenance, and the preservation of heritage assets.

The interviews conducted with FM experts provided valuable insights into the current state of facility management, the challenges faced by FM personnel, and a glimpse into the future of the industry. Moreover, these discussions led to recommendations for further research in this evolving domain.

In summary, this thesis advances our understanding of DT and sheds light on its multifaceted applications in asset management, with a particular focus on the dynamic landscape of the AEC/FM industry. It underscores the transformative potential of DT as a tool for optimizing asset performance and decision-making throughout the asset lifecycle.

Keywords: Architecture, Engineering, and Construction (AEC), Digital Twin (DT), Asset Management, Facility Management (FM), Building Information Modeling (BIM)