Cyprus University of Technology
Department of Civil Engineering and Geomatics

Bachelor's Thesis

IMPLEMENTATIONS, BENEFITS AND CHALLENGES OF BUILDING INFORMATION MODELLING (BIM) AND DIGITAL TWINS (DT) TECHNOLOGIES IN THE ARCHITECTURE, ENGINEERING AND CONSTRUCTION INDUSTRY

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Limassol, May 2023

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ABSTRACT

Building Information Modelling (BIM) and Digital Twins (DT) technologies are gaining popularity in the Architecture, Engineering and Construction industry. In order to keep the industry aware of BIM and Digital Twins, it was considered essential to introduce the definitions, implementations, benefits and challenges. Furthermore, to review the development of BIM and Digital Twins, it was necessary to present the history of these technologies. In addition, up until now, BIM dimensions can only support 3D and 4D. The current implementation of BIM and Digital Twins in the Architecture, Engineering and Construction industry are limited. Moreover, Extended Reality (XR) can be used within BIM and is presented as an immersive technology which includes three categories (Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR)). Smart city technologies, such as City Digital Twins and integrating Digital Twins with the GIS, were also reviewed. Finally, as there are similarities between BIM and Digital Twins, it was important to indicate the differences between these technologies and when each is implemented.

Keywords: Building Information Modelling (BIM), Digital Twins (DT), Extended Reality (XR), Geographic Information System (GIS), Smart Cities