A COMPREHENSIVE ANALYSIS OF THE ROLE OF DIGITAL TWIN TECHNOLOGY IN THE CONSTRUCTION INDUSTRY

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Abstract: The primary aim of this research study is to explore the application of digital twin technology within the construction industry. The objectives of the study were described as follows; to investigate the application of digital twin in construction industry, evaluate the concept of digital twin in construction industry, assess the challenges to implement digital twin in construction industry and explore the strategies to overcome the barriers of digital twin in construction industry. To achieve these objectives, the research relied on comprehensive literature findings that were gathered through an extensive review of journal articles, books, websites, and other pertinent sources. The research study was utilized a qualitative approach, ensuring a thorough examination and synthesis of existing knowledge. The study's key findings revealed that the concept of a digital twin was first proposed by NASA's Apollo 13 mission, which was intended to solve spacecraft difficulties. From simple CAD systems to complex, real-time 3D-powered models that combine many data sources for improved visualization and decision-making, DT has advanced over time. When it comes to the application of digital twins in construction, DT technology makes it possible for perfect synchronization, bi-directional coordination, and real-time updates between digital and physical assets. Lack of understanding, high implementation costs, and reluctance to embrace cutting-edge technologies are major obstacles to the adoption of digital twins. The primary strategies for digital twin technology are Construction projects may be operated and maintained more efficiently if DT is used early on. Furthermore, the validity of the research findings is reinforced by validation from industry experts, who provide critical feedback and ensure the relevance and applicability of the results in real-world construction scenarios.

Keywords: Digital Twin Technology, Construction Industry, AI Technologies.