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CHAPTER ONE INTRODUCTION

1.1 Background to the study

An essential component of infrastructure development is building and building. It entails planning, building, and upholding the infrastructure that is essential to society. According to Rajaonah (2017), the Internet and information systems are now at the heart of the majority of services and businesses in organisations, institutions, and corporations. According to Li *et al.* (2022), the use of technology-based information in the planning, building, and upkeep of building infrastructure is expanding significantly more than in the past.

The maintenance phase of the building infrastructure life cycle and the applications of wireless sensor networks (WSN), fibre optic sensing (FOS), building information modelling (BIM), and radio frequency identification (RFID) in areas like location optimisation, schedule monitoring, safety warning, and structural health monitoring (SHM) were the main topics of their research. It was confirmed that next-generation smart infrastructure may be planned and managed using digital twins, which are a blend of computer models and real-world systems, making building infrastructure more intelligent and sustainable in the future.

According to Zhu *et al.* (2018), BIM has been studied to support the Architecture, Engineering, and Construction/Facility Management (AEC/FM) domain by offering detailed 3D building models that could be used throughout a construction project's life cycle, including plan, design, construction, operation, and dismantling. The BIM manual was written by Charles Eastman, the founder of BIM, and Chuck's thesis from 1975 on "The Use of Computers Instead of Drawings in Building Design" outlined a computer program that could conduct parametric design