


Chapter 5

Challenges in Adopting Internet of Thing (IoT)–Based Real–Time Monitoring Technologies in Malaysian Construction Industry

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ABSTRACT

Internet of Things (IoT) provides real-time monitoring function for the construction players to assess accurate data for decision making. The technologies being used in Malaysia construction industry include sensors, drones, RFIDs and others. These technologies improve project's efficiency in several areas with its real-time report, yet adoption still low. Most studies focused on IoT implementation during the design phase, with few studies concentrating on the construction phase, particularly from the standpoint of contractors. Considering contractors make many decisions during the construction phase, IoT assist them for quick and precise decisions. This paper focus on the challenges in adopting IoT-based real-time monitoring technologies in the Malaysian construction industry. The research adopted qualitative method via

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semi-structured interviews with three G7 contractors in using those IoT and result in ten challenges. The findings are to increase industry participants' understanding and adoption of IoT in construction projects, hence enhancing project efficiency.

INTRODUCTION

Internet of Things (IoT) is said to be an advanced digital technology that is leading a new revolution, Industrial Revolution 4.0 (IR4.0) in today's world (Mahmud et al., 2018). Significant contributions of IoT includes smart cities, smart homes, smart transportation, pollution control and energy savings (Aleksandrova et al., 2019; Beniwal & Singhrova, 2022; Chen et al., 2020; Elghaish, Hosseini, et al., 2021; Hassan et al., 2020; Hou & Li, 2020; Kumar et al., 2019). In construction industry, IoT is being introducing to smoothen the construction operations and also overcome the challenges that might be faced (Mahmud et al., 2018). In relation to Construction 4.0, nine (9) pillars have been introduced for the construction players to monitor and control the whole project lifecycle. They are IoT, advanced robotics /autonomous robots, additive manufacturing, augmented reality, simulation, system integration, cloud computing, cybersecurity and big-data analytics (Ibrahim et al., 2021; Mahmud et al., 2018). Among all these, IoT has been highlighted as one of the core elements to improve productivity and bring better performance (Ibrahim et al., 2021; Oke et al., 2022). The development of the IoT has made a huge impact and offers various benefits to the construction projects and the construction participants. IoT systems are capable of gathering and sending data through the hardware and software by connecting to the Internet to enhance the process in various stages of construction (Gbadamosi et al., 2019). IoT has the potential to shift the construction industry up to a higher level by the usage of the innovative solutions as an assistance for the construction players to adapt the IoT technologies and make changes to the construction industry (Halim et al., 2021).

The IoT provided with real-time monitoring function can strengthen the information collection, storage and analysis for improved decision-making (Al-Amleh, 2020). The growth of IoT in the Dubai construction industry has shown effective waste management, safety management and cost reduction (Al-Amleh, 2020). IoT has greatly enhanced sustainability smart buildings or smart homes (Beniwal & Singhrova, 2022; Fernandez, 2019; Jia et al., 2019; Oke et al., 2022). Besides, IoT has also developed some intelligent applications in some of the built environment domain such as smart healthcare facilities, smart transportations and traffic systems, smart cities, control of logistic supply chain, fleet tracking systems, industrial automation, energy efficiency, waste management and environmental monitoring (Beniwal & Singhrova, 2022; Chen et al., 2020; Ghosh et al., 2020; Hassan et al.,

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