Implications of Construction 4.0 technologies to enhancing well-being: a fuzzy TOPSIS evaluation

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Abstract

Purpose – Amid rapid technological progress, the construction industry is embracing Construction 4.0, redefining work practices through emerging technologies. However, the implications of Construction 4.0 technologies to enhancing well-being are still poorly understood. Particularly, the challenge lies in selecting technologies that critically contribute to well-being enhancement. Therefore, this study aims to evaluate the implications of Construction 4.0 technologies to enhancing well-being.

Design/methodology/approach – A list of Construction 4.0 technologies was identified from a national strategic plan on Construction 4.0, using Malaysia as a case study. Fourteen construction industry experts were selected to evaluate the implications of Construction 4.0 technologies on well-being using fuzzy Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). The expert judgment was measured using linguistic variables that were transformed into fuzzy values. Then, the collected data was analyzed using the following analyses: fuzzy TOPSIS, Pareto, normalization, sensitivity, ranking performance and correlation.

Findings – Six Construction 4.0 technologies are critical to enhancing well-being: cloud & real-time collaboration, big data & predictive analytics, Internet of Things, building information modeling, autonomous construction and augmented reality & virtualization. In addition, artificial intelligence and advanced building materials are recommended to be implemented simultaneously as a very strong correlation exists between them.

Originality/value – The novelty of this study lies in a comprehensive understanding of the implications of Construction 4.0 technologies to enhancing well-being. The findings can assist researchers, industry

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