

# Evaluating Construction 4.0 technologies in enhancing safety and health: case study of a national strategic plan

Construction  
4.0  
technologies

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## Abstract

**Purpose** – Policymakers are developing national strategic plans to encourage organizations to adopt Construction 4.0 technologies. However, organizations often adopt the recommended technologies without aligning with organizational vision. Furthermore, there is no prioritization on which Construction 4.0 technology should be adopted, including the impact of the technologies on different criteria such as safety and health. Therefore, this study aims to evaluate Construction 4.0 technologies listed in a national strategic plan that targets the enhancement of safety and health.

**Design/methodology/approach** – A list of Construction 4.0 technologies from a national strategic plan is evaluated using the fuzzy technique for order preference by similarity to ideal solution (TOPSIS) method. Then, the data are analyzed using reliability, fuzzy TOPSIS, normalization, Pareto, sensitivity, ranking and correlation analyses.

**Findings** – The analyses identified six Construction 4.0 technologies that are critical in enhancing safety and health: Internet of Things, autonomous construction, big data and predictive analytics, artificial Intelligence, building information modeling and augmented reality and virtualization. In addition, six pairs of Construction 4.0 technologies illustrate strong relationships.

**Originality/value** – This study contributes to the existing body of knowledge by ranking a list of Construction 4.0 technologies in a national strategic plan that targets the enhancement of safety and health. Decision-makers can use the study findings to prioritize the technologies during the adoption process. Also, to the best of the authors' knowledge, this study is the first to evaluate the impact of Construction 4.0 technologies listed in a national strategic plan on a specific criterion.

**Keywords** Construction 4.0, Emerging technologies, Fuzzy TOPSIS, Safety and health

**Paper type** Research paper



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