Factors affecting BIM implementation in Saudi Arabia: a critical analysis

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ABSTRACT

Purpose: This study examines the underlying relationships between the critical factors of building information modeling (BIM) implementation and the factors' groupings among architecture, engineering and construction (AEC) organizations in Saudi Arabia. The objectives of the study are to (1) identify the critical factors for BIM implementation, (2) analyze the interrelationships between the critical factors and (3) compare the critical factors between the different organizational characteristics. **Design/methodology/approach:** First, potential factors were identified through a systematic literature review and interviews with AEC professionals. Then, a questionnaire survey was sent to AEC professionals and the collected data were analyzed using the following techniques and tests: mean score ranking, standard deviation, normalized value, factor analysis (FA), analysis of variance (ANOVA) and post-hoc Tukey test. **Findings:** The analyses show that 14 factors are critical for BIM implementation in Saudi Arabia. The top critical factors include the existence of standard contracts on data security and user confidentiality, consistent views on BIM among stakeholders and the availability of guidelines for implementing BIM. Of the 14 critical factors, 9 can be grouped into 4 underlying factors: environmental, governmental, legal and organizational. The analysis shows that the criticality of the most critical factors grouped by the FA varies between different levels of BIM competency. Finally, the presence of public–private partnerships (PPPs) in realizing BIM projects is a new and emerging critical factor for BIM implementation in Saudi Arabia. **Originality/value:** This study differs from prior works on BIM implementation in Saudi Arabia by using FA to explore the underlying relationships among factors of BIM implementation and the factors' groupings. Based on the FA results, a roadmap for implementing the BIM was developed. These findings will help to purposefully and efficiently customize BIM implementation strategies and initiatives to ensure successful BIM implementation in Saudi Arabia.

KEYWORDS

Automation; Building information modelling; Inferential statistics; Multivariate analysis; Saudi Arabia

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