

Smart and Emerging Technologies: Shaping the Future of the Industry and Offsite Construction

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ABSTRACT

The interest in smart, emerging technologies and offsite construction methods continues to grow. While previous studies investigated different offsite construction aspects, there is still lack of research work that explored the current and future use of smart and emerging technologies, especially those used in offsite construction. This study addresses this knowledge gap through a multi-step research methodology. First, a list of 24 technologies was identified. Second, a survey was distributed to study the current use and the experts' future perceptions of the identified technologies in offsite construction. Third, descriptive statistics and computational clustering analysis were used to quantify and classify the current and expected future use of offsite construction technologies. The findings reflected that the industry will experience an increased reliance on all offsite construction technologies in the future. The outcomes also indicated that the top 10 technologies with the highest potential in the future include: 1) drones and remote monitoring; 2) smart sensors; 3) artificial intelligence, cognitive learning, and computer/machine vision; 4) extended reality (i.e., virtualization); 5) integrated real-time project management information systems; 6) wireless technology and nG networks; 7) big data, data analytics, and data ecosystem; 8) robotics; 9) internet of things (IoT); and 10) nD printing and additive manufacturing. This study adds to the body of knowledge by helping practitioners identify strategic technologies that will shape the future of the construction industry and offsite construction.