

Accelerating the Uptake of Advanced Digital Technologies for Health and Safety Management within Construction Small and Medium Enterprises (SMEs)

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ABSTRACT

Health and safety problems are essential for the construction industry, and such problems are more pronounced in small and medium enterprises (SMEs) due to the lack of financial resources and skilled personnel. Researchers have explored the feasibility and viability of addressing such constraints using artificial intelligence-enhanced, low-cost sensor systems. Our previous studies have investigated both conventional machine learning and deep neural network models for recognizing workers' postures from low-cost wearable sensors and assessing the ergonomics risks for injury prevention. In the next steps for this research, we are investigating adoption drivers and diffusion barriers for the scaled deployment of AI-enhanced sensor networks and other emerging digital technologies for construction health and safety in a real-work setting. Although the COVID-19 pandemic has brought unprecedented challenges, it has also sped up the digital technology adoption. The discussion in this paper is directed at building on this momentum to advance the use of emerging digital technologies at construction SMEs. The authors conducted a systematic review of literature on digital technologies at construction SMEs and how COVID-19 affected the digital transformation at SMEs. After an initial screening of a total of 170 articles, the key publications based on the research questions were selected for a more in-depth analysis. It emerged that although construction SMEs have embraced the use of several digital technologies during the current pandemic, there is still a large digital divide between these companies and larger companies. The research discussed in this paper contributes to efforts directed at addressing this problem through the design and deployment of SME-centric digital technologies for construction health and safety.