BIM & Lean Construction well-established in major firms but lacking within industry's SMEs

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The construction industry can be transformed by adoption of the practices termed Building Information Modelling (BIM) and Lean

Construction.

But research at the University of Huddersfield warns that the smaller firms who form the bedrock of the sector are in danger of missing out on cutting-edge techniques that lead to radical improvements in efficiency and productivity.

The research is described in an article published by the long-established and globally-respected *Canadian Journal of Civil Engineering*.

Titled "Lean Construction and BIM in Small and Medium-Sized Enterprises (SMEs) in Construction," it has been named as one of the journal's "editor's choice" papers of 2020. This means it is one of a small number that can be freely accessed worldwide, so that its findings have greater impact.

The research was carried out at the University of Huddersfield's School of Art, Design and Architecture, in collaboration with colleagues at the Galway-Mayo Institute of Technology in Ireland.

Lead author of the resultant article is Dr. Algan Tezel, who is Senior Lecturer in Construction Project Management at Huddersfield's Department of Architecture and 3-D Design.

He explained that 80 per cent of the construction industry is made of SMEs, often working as sub-contractors for larger firms.

But when Dr. Tezel and his colleagues made an in-depth study of published research that had been carried out into the adoption of BIM and Lean Construction in the building sector, they found that there was a dearth of material dealing with SMEs.

"This is a problem," said Dr. Tezel, "because these two concepts—BIM

and Lean Construction—have the potential to change the dynamics of the construction industry. But if you can't get them into those smaller and medium-sized players, which make up the majority of the industry, then that promise will not materialise."

There needs to be a much greater focus on the smaller operators, continued Dr. Tezel.

"They might not have the profile of the larger companies and might not be responsible for the flashier projects, but they are the core people at the building workface."

The article explains the background to BIM and Lean Construction. The former is described as a process that encompasses the creation and use of a digital representation of a building or project.

BIM increases the potential for wider and deeper collaboration between stakeholders and other benefits include speeding up the design and build process; better designs via rigorous assessment; accurate prediction of environmental and life-cycle data and improved customer service, because of better visualisation.

"The term 'Lean Construction' refers to the adaptation of lean manufacturing techniques that originated in the Japanese motor industry. It is focussed upon 'better meeting client expectations while using less of everything,'" explains the article by Dr. Tezel and his colleagues.

They conclude that, "despite the hype, investigations show that the wholesale uptake of BIM and Lean Construction at SMEs is problematic. "It is not possible," they continue, "to realise the rhetorical promises of BIM and LC, two of the prominent concepts challenging the traditional practices in construction management, without giving sufficient consideration to SMEs. This is accentuated especially when there are

policy initiatives in many countries towards improving productivity in the construction industry."

More information: Algan Tezel et al, Lean construction and BIM in small and medium-sized enterprises (SMEs) in construction: a systematic literature review, *Canadian Journal of Civil Engineering* (2019). DOI: 10.1139/cjce-2018-0408

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