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Interactions of Building Information Modeling, Lean and Sustainability on the Architectural, Engineering and Construction industry: a systematic review

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Abstract

Many studies have been conducted on the fields of Building Information Modeling, Lean construction and Sustainability not only individually but also pairwise. Despite that, there are currently no researches that integrate these concepts collectively. The aim of this paper is to combine these technologies, methods and concepts to fill this gap targeting the Architecture, Engineering and Construction industry by proposing a way in which concepts could coexist and complement each other. To that end, a systematic literature review was conducted to understand how synergies between these fields have recently been explored by researchers. Results indicate synergies mainly on the construction stages but also on the project process specially during conceptual design decision making. The presented integration provides significant opportunities to reduce economic and environmental impacts and in the future may be responsible for a great leap in efficiency to one of the least efficient industries worldwide.

Keywords: Building Information Modeling, Lean construction, Green construction, Synergies, Sustainable development

1. Introduction

Over time, sustainable concerns have increasingly gained importance in the Architectural, Engineering and Construction (AEC) industry. In the last decade, there has been a growing pressure in terms of not only improving quality, productivity, efficiency and effectiveness, but also sustainable development. Among the challenges for the sustainability of the construction sector, there are: excessive material and process waste, over reliance on

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