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# Building Information Modeling Acting as Protagonist and Link between the Virtual Environment and the Real-World for Efficiency in Building Production

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**Abstract :** Advances in Information and Communication Technologies (ICT) have led to changes in different sectors particularly in architecture, engineering, construction, and operation (AECO) industry. In this context, the advent of BIM (Building Information Modeling) has brought a number of opportunities in the field of the digital architectural design process bringing integrated design concepts that impact on the development, elaboration, coordination, and management of ventures. The project scope has begun to contemplate, from its original stage, the third dimension, by means of virtual environments (VEs), composed of models containing different specialties, substituting the two-dimensional products. The possibility to simulate the construction process of a venture in a VE starts at the beginning of the design process offering, through new technologies, many possibilities beyond geometrical digital modeling. This is a significant change and relates not only to form, but also to how information is appropriated in architectural and engineering models and exchanged among professionals. In order to achieve the main objective of this work, the Design Science Research Method will be adopted to elaborate an artifact containing strategies for the application and use of ICTs from BIM flows, with pre-construction cut-off to the execution of the building. This article intends to discuss and investigate how BIM can be extended to the site acting as a protagonist and link between the Virtual Environments and the Real-World, as well as its contribution to the integration of the value chain and the consequent increase of efficiency in the production of the building. The virtualization of the design process has reached high levels of development through the use of BIM. Therefore it is essential that the lessons learned with the virtual models be transposed to the actual building production increasing precision and efficiency. Thus, this paper discusses how the Fourth Industrial Revolution has impacted on property developments and how BIM could be the propellant acting as the main fuel and link between the virtual environment and the real production for the structuring of flows, information management and efficiency in this process. The results obtained are partial and not definite up to the date of this publication. This research is part of a doctoral thesis development, which focuses on the discussion of the impact of digital transformation in the construction of residential buildings in Brazil.

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