Using Immersive Technologies and Digital Twins for interdisciplinary Teamwork in Architecture, Engineering and Construction

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Abstract. Immersive technologies have a very large potential to enhance the interdisciplinary teamwork in engineering teams, because they provide a way to visualize geometry data of products, technical systems, and buildings in their natural perspective. The visualization helps the teams to communicate in a better way and find errors in the data, even before any physical object was built. Industries like Automotive are already widely adapting these technologies to enable close collaboration between the departments of design, engineering, and production to reduce error rate in their projects.
This article describes the possibilities of integrated immersive technologies and the using of digital twins in Architecture, Engineering, and Construction (AEC). These possibilities are the first results of a research project that aims to look at the entire life cycle of a building and identify potential use cases for digital twins and technologies like virtual reality and augmented reality throughout all stages of the life cycle. The goal is to integrate all participants of the construction process in one communication platform. One focus of research are the immersive assistance systems for construction workers and how working instructions can be generated for example to locate drilling positions automatically for various installation tasks as 3D Data. The aim of the project is to support the employees digitally in their tasks and to reduce the errors due to the 2D drawings traditionally used in the construction industry.

Keywords. Virtual Reality, Augmented Reality, Digital Twin, Transdisciplinary Collaboration, Assistance System

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