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Successfulness of BIM application – reality or wishful thinking?

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1 Abstract

BIM application in bridge engineering is becoming more and more popular and authorities are worldwide starting to request BIM as a prerequisite for contract awarding. However, some 20 years after the first mention of the term BIM, the postulated processes are to a great extent still piecemeal in this industry.

The heart of the BIM process is hereby a sophisticated digital model of the bridge. The quality of this model, i.e. the integrity and completeness of its data structure, essentially governs the straight-forward usability for differing purposes, and thus the effectiveness of the BIM process. The advantage of end-to-end data management is often lost, when the dataset is confined to geometric data with ignoring the time as 4th dimension, and when applications like structural analyses require laborious data conversion and supplementation.

A strictly parametric model description is a key-point in this context. I.e. the description contains planning criteria and development rules as part of the model. This data structure allows the direct use for many different applications like visualization, quantity take-off, detailing, draft production, structural analysis and strength assessment. Other key-points are an intelligent and self-explaining user interface and an open structure allowing easy communication over different platforms.

To check the potential savings due to BIM we investigated effectivity issues cropped up in the planning process of a typical concrete bridge. Difficulties and backlashes encountered in the BIM process have been explored. In addition, a pilot project was used for testing an alternative process with a new software tool. By this means we checked, whether the detected problems concerning data conversion and learning phases for using different tools can be avoided by using an approach combining geometric BIM model and analytic model for static analyses.

Keywords: Bridge Engineering, BIM Process, Parametric 4D-Model, Timeline, Construction Sequence

2 Introduction

In structural engineering, BIM (Building Information Modelling) is generally conceived as overall strategy for coordinating all required works arising during design and construction of structures. This goal is achieved by using an integrated digital model, and procedures directly communicating with it in all task settings throughout planning and construction. The common aim is to ease and accelerate the process

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