



BIM authoring and Data Models for Bridge Maintenance Systems in Korea

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Abstract

A digital model-based bridge maintenance system (BMS) is a challenging mission due to large volume of bridge inventory and their data for long period. Building information modelling (BIM) provides an efficient information delivery during life-cycle of bridge projects. In this paper, model authoring with visual programming for bridges is introduced to minimize the effort to create 3D models for the information delivery. A data model for a few bridge types is also suggested to deliver essential information for the bridge maintenance. During design and construction, digital engineering models are defined to accommodate information requirements from project participants. Changes of geometry and their properties are collected to revise the digital engineering models for reliable as-built models. Existing bridge maintenance systems in Korea need to be improved for nation-wide digitalized bridges. Two cases of BIM-based BMS on a cable-stayed bridge and common bridges are introduced. The new systems included point cloud data by scanning and data from non-destructive testing as a part of the data model. Through these efforts, data pipeline from data creation to data uses was attempted, and data-driven bridge maintenance can be realized in national scale

Keywords: bridge maintenance system, digital engineering model; model authoring; data model; data-driven.

1 Introduction

The digitalization of construction industry is reshaping the construction value chain from design to operation. Building information modeling (BIM) is considered as the backbone of the digital transformation. More efficient, transparent, and real-time collaboration can be accomplished by

sharing information such as CDE (common data environment). Open standard for the digital communication is essential for new construction projects and digitalization of existing infrastructure. The operation and maintenance phase has the longest period and the highest cost in the lifecycle of bridges. Most bridges do not have digitalized data from design to handover. Data complexity