



Product and Process Platforms in Transport Infrastructure Projects

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Abstract

Construction is traditionally a trade that produces unique, one-off products designed specifically according to the project requirements. However, recently developed flexible product and process platforms in industrialized house building based on the theory of mass customisation offer products that can be customized to a large extent with affordable costs. In this paper we present a framework for how a product and process platform can be developed and used in a traditional engineer-to-order design and construction of transport infrastructure products. The framework is exemplified in a case study, where a typical concrete bridge type is modularised and customized using a product configurator. A database driven simulation model using process patterns and values stored in the platform, is then constructed to test the buildability of the bridge configuration. The results presented provide evidence that product and process platforms can support the design, and planning process of transport infrastructure projects, by integrating product and process information. The results specifically demonstrate how product configuration and database-driven simulation can be used to evaluate the effects of design alternatives and construction methods on performance measures such as productivity and environmental impact.

Keywords: Product platform, process platform, product configurator, simulation

1 Introduction

Efficiency and productivity are key challenges in the transport infrastructure sector and many infrastructure projects suffer from cost and schedule overruns [1, 2, 3]. The Swedish Transport Administration (STA), the major public procurer of transport infrastructure in Sweden, has been assigned by the government the task of creating conditions to improve productivity in the

infrastructure sector. Due to the perceived need, STA has launched a long-term research and innovation program to identify ways to increase industrialization in the sector.

Construction of transport infrastructure belongs to the engineer-to-order (ETO) category of production systems developing complex one-of-a-kind products that are realized by temporary organizations on-site [4, 5]. Tendering is often