

### **A PRODUCTION MODEL FOR CONSTRUCTION: A THEORETICAL FRAMEWORK**

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The construction industry faces challenges like increasingly more complex projects, declining project backlogs, economic uncertainty, and increasing competition. Furthermore, the construction industry has no history of the application of mathematical approaches to model and manage production. In essence, the sector relies on practices based on intuition and experience, lacking the required level of uncertainty and complexity. Mathematical models had enabled a comprehensive understanding of production mechanisms. Manufacturing industry has a track record of success in developing and using robust mathematical models. But, the model for manufacturing cannot be applied directly to construction. Production in manufacturing is characterized by steady state conditions, nonterminating events, long production runs, low to medium levels of uncertainty, and permanent production facilities. In contrast, production in construction takes place under unsteady state conditions, with terminating events, short production runs, and high levels of uncertainty, all conducted in temporary production facilities. There has been little research in construction to understand the fundamental mechanisms of its production. This research develops an in-depth literature review to examine the existing knowledge about production models in other industrial fields in order to establish the foundation for a production model in construction. As a result, a theoretical framework is proposed which will be instrumental to the further development of a mathematical production model aimed to reliably predict the performance and production behavior of projects.

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