

ABSTRACT

Analyzing The Productivity Of Precast Manufacturing Using Agent-Based Modeling (ABM) (Case Study: Development of Jakarta – Cikampek II South Toll Road Project)

Anggita Theresia Imanuela Simanjuntak ¹⁾, Lukas Beladi Sihombing ²⁾

¹⁾ *Students of Civil Engineering Department, Pembangunan Jaya University*

²⁾ *Lecturer of Civil Engineering Department, Pembangunan Jaya University*

Analyzing productivity in the precast manufacturing is essential to increasing efficiency and making sustainability of modern construction processes. According to the complexity of production and the interconnected nature of its features, a comprehensive analytical method is required to get an accurate understanding of the dynamics. This study use Agent-Based Modeling (ABM) to analyze and evaluate productivity in precast manufacturing processes. ABM supports dynamic simulation modelling by representing workers, equipment, and materials as interacting agents, offering a flexible and precise representation of operational conditions. The results of the simulation analysis showed an imbalance in workload, especially in the segment casting process, which shown a utilization rate of 0.025. This low utilization performs as a significant parts affecting output. The simulation model was modified, resulting in a significant increase in utilization, reaching 0.534. Future research might focus on improving ABM models to contain more complexity and flexibility, thus increasing their capacity to manage and modify the dynamic needs present in precast manufacturing.

Keywords: *Agent-Based Modeling (ABM), Precast Manufacturing, Productivity*

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