

# **A Text-based Simulation Framework for the Automated Simulation and Analysis of Manufacturing Assembly Systems**

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## **Abstract**

The rapid advancement of manufacturing has led to the creation of a myriad of technologies that facilitate the analysis and simulation of manufacturing processes. These technologies have become a pivotal component in maintaining and improving processes in today's complex manufacturing environments. Discrete Event Simulation (DES) is one such technology that has seen widespread use in the analysis of manufacturing assembly systems. However, despite its widespread use, organizations recognize that most of the commercially available DES software packages used to develop and maintain simulation models are costly and require significant levels of expertise, time, and resources.

This research introduces a new text-based simulation framework titled the Automated Simulation Analysis Engine (ASAE) that aims to reduce the steep learning curve typically experienced by users when creating, running, and analyzing a simulation model. Two testing approaches were used to validate the correctness and usability of the proposed test-based simulation framework. The results of these tests suggest that the ASAE simulation framework has the potential of reducing the skills, time, and resources required when conducting a simulation-based study.

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