

# A simulation-based approach to study the influence of different production flows on manufacturing of customized products

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## ABSTRACT

Manufacturing products tailored to the individual requirements of customers is a must if companies want to compete effectively on the market. The production of customized goods poses new challenges for all areas of functioning of production systems. It is necessary to adopt such rules and methods that will allow a flexible response to product design changes and their demand in the organization of production flow (materials and information). The article presents research carried out in the SmartFactory laboratory of the Poznań University of Technology regarding the impact of the structure of products (customization) on the realization of current production orders. The research was carried out using the FlexSim simulation environment. Based on simulation experiments for three forms of organization of production flow with varying degrees of flexibility of production resources, an analysis was made of the time of execution of various sets of production orders and the level of use of available working time. The results of research indicate that in the production of products with low and high planned labor consumption, the use of universal production stations is the most advantageous. For such a solution, the degree of utilization of the available working time of production stations is also the highest. It was also found that the principles of scheduling production orders affect the effectiveness of the production system. The best results were obtained for the production schedule, where the sequence of production orders was established from the lowest planned time of resource loading.

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