

# Simulation-based time evaluation of basic manual assembly tasks

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## ABSTRACT

The paper presents a simple simulation model of the lifting procedure that can be used to predict the total time required for the sequence of basic manual assembly tasks depending on the various parameters of the load and with regard to the workers' health. The aim of the research is to determine the appropriateness of using simulation tool for (re)setting time standards for manual assembly tasks. An avatar in the simulation model performs sequences of tasks with a handling mass of up to 20.5 kg. The individual times obtained from the simulation model were analysed and compared with several time prediction methods and validated in laboratory environment. An analysis of the influence of different load parameters on the total time was also performed. Dependency is mostly linear, so from the practitioner point of view, we can predict with reasonable certainty the total time for any sequence of manual assembly tasks for every size and mass of the box. Based on the results we can confirm that simulation tool JACK is suitable not only for ergonomic analyses but also for setting time standards for the workers. Furthermore, with the simulation tool we analyse the process and get the accurate results in shorter time compared to other mentioned methods.

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