

Possibilities of Modeling and Simulation of Processes in The Enterprise, With Particular Emphasis On Reverse Logistics

Jarosław Banaś

Maria Curie-Skłodowska University, Poland
jaroslaw.banas@mail.umcs.pl

Abstract

The company's management staff constantly makes decisions regarding the company's current operation and plans long-term strategies. For the organization's survival and development, it is crucial to analyze the immediate and distant environment, conduct market research, look for market opportunities (niches), assess the attractiveness of sectors, etc.

Nowadays, the ability to continuously analyze an enterprise's current processes is becoming increasingly important. It is possible to present processes in model terms, analyze them, introduce modifications, and conduct a series of simulations to check what effects are achieved by changing the given input parameters. It is possible to optimize processes in the organization thanks to modeling and simulation. These valuable benefits are still challenging to achieve through artificial intelligence – specialists with knowledge and experience are important.

Pro-ecological issues are also an essential aspect of the company's operations. Therefore, processes in the organization should include solutions that minimize the negative impact on the natural environment.

The publication will present an analysis of the literature on the theoretical aspects of modelling, simulation, and optimization of logistics processes. Additionally, selected data from secondary sources will be presented. The publication will be enriched with a model of an exemplary process, also considering aspects of reverse logistics (waste logistics). The possibilities of creating a process model and its subsequent modification will be presented. The data obtained from the simulation will be analyzed and may be further processed using external software.

Keywords: modeling, simulation, optimization, logistics processes, reverse logistics, waste