

Building A More Complex Simulation Model – Cross-Docking Center With Pallet and Box Handling*

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* Presented at the 42nd IBIMA International Conference, 22-23 November 2023, Seville, Spain

Abstract

The paper focuses on the possibility of using simulations in supply chain management. Specifically, the simulation of logistics technology cross-docking, i.e. transshipment without warehousing, is investigated. The paper examines the suitability of the simulation software Simul8 (Professional version) for modeling a cross-docking center. After theoretical research on the topic, the specified problem and the simulation solution are presented. A simplified simulation model is developed, but it is fully sufficient to discuss the benefits and limitations of the chosen software solution. The main contribution is a description of the main challenges in the modeling process as well as an overall evaluation of the software. Contrary to other studies, not only pallet handling but also sorting at the box level in center is investigated. Exactly this part (hierarchization of entities) seems to be the most difficult part of the modeling. Examined software has a relatively simple and intuitive interface and proved to be suitable for the chosen sophisticated problem but with some limitations. The main limitation is the lack of entity hierarchy capability (and related implications in results). Another potentially problematic issue was the modeling of misplaced boxes and the configuration of collection of boxes (for completing pallets). The correct interpretation of result characteristics also requires higher user effort. The presented simulation model would not be possible to create so precisely in free Simul8 Basic version. Overall, this paper provides valuable information for novice modelers in the field of logistics.

Keywords: cross-docking, logistics, simulation, supply chain management.