

USE OF A SIMULATION-BASED OPTIMIZATION METHOD FOR ALLOCATION OF WORKERS IN LOGISTICS WAREHOUSES.

ABSTRACT

The problem of general assignment poses a formidable challenge acknowledged for its NP-hard complexity. Within warehouse logistics, this challenge amplifies given the constraints imposed by equipment and the intricacies of sequential processes. To surmount the intricacies of assessing assignment benefits and devising optimal strategies, we adopted a simulation-driven optimization approach. Our initial step involved crafting a warehouse simulation model leveraging an object-oriented discrete event simulation framework. Subsequently, we employed a stochastic neighborhood search technique informed by simulation outcomes. This method enhances warehouse throughput and service levels while maintaining workforce stability. Empirical findings gleaned from authentic datasets underscore a notable reduction in the disjunction between inbound and outbound service efficiencies. By curtailing inbound service levels by a margin of under 8%, we achieved a remarkable surge exceeding 25% in outbound service proficiency. The integration of a decision support tool serves as a pivotal resource empowering logistics managers to navigate the complexities of workforce allocation amidst fluctuating daily workloads.

KEYWORDS. Discrete event simulation, Simulation-based optimization, Distribution problem.

Paper topics: Simulation-based optimization.