Modelling Order Picking Sequencing Variations of Pallet Setup Clusters

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Abstract— Order picking is the most labour-intensive and costly activities in many warehouses by consuming ca. 60 % of the total operating expenses. Order picking development strategies mostly concentrate on warehouse layout, storage assignment policy, routing, zoning and on batching methods. The main challenges of order picking process improvements are the synchronization of these fields and fit the system with the further influencing factors, like unique demands and product parameters.

Researchers of the pallet-loading problem could provide a wider horizon on considerable parameters, but their results are rarely implemented into order picking processes. The physical parameters of the products also have a significant impact on the processes which could strongly influence the picking sequence. It is necessary to define the importance of this problem warehouse by warehouse, because of the uniqueness of products lines and variability of processes. It supports the order picking process development to take into consideration the pallet setup features with the necessary rate.

This paper introduces our research about clustering ordered items based on pallet setup features, modelling the possible order picking sequence of pallet setup clusters and evaluating the impact of physical product parameters on order picking. We describe how our model could be used during warehousing process development and implemented into routing algorithms.

Key words— order picking, pallet setup features, modelling, sequencing.

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