The Design of Storage Assignment and Route Planning in Warehouse Systems

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Abstract

In today's highly competitive global market, distribution centres work very hard in delivering the right quantity of products to the correct location in the exact time frame. Its goal is to minimize the overall cost of the warehouse system under a satisfactory service standard to the customer. Consequently, the warehouse system design combined with the order picking route planning can increase production efficiency, enhancing space utilization and lowering costs.

According to the related literature and in depth understanding of the actual world, the proper use of storage assignment strategy can achieve the goal of utilizing the least storage space to make minimization of travelling distance possible. It has a direct effect on enhancing the order picking operations. In addition, appropriate order picking route planning minimizes the overall travelling costs, ensuring that the performance of order picking is improved. Consequently, this study first uses the mathematical programming model to obtain the best storage assignment; then it continues to consider its actual applicability, presenting a heuristic algorithm and conducting a simulated analysis using eM-plant software including three indexes: utility of material handling equipments, number of completed orders in an unit time, and average order picking distance to gather information and data. It hopes to be able include location layout, storage assignment, and route planning in the optimal integrated scheme.

Keyword：storage assignment, route planning, simulation