ABSTRACT

Picking is the number one cost center for most warehouses, representing up to 65% of their total expenditures. Travel time is the largest component of the picking cost which makes travel distance an extremely important variable. The critical issue is to reduce a warehouses picking cost by reducing the overall distance traveled by pickers. While there have been many attempts to reduce travel distance by improving product assignment, pick routing and warehouse design, this research addresses pick location design. Existing methods to pick location design are very basic as the issue is barely addressed. Most research either assumes location sizes are not a constraint, or that a single location size will be sufficient. This research shows that that an intelligent approach to pick location design can significantly increase a warehouses space utilization and decrease the distance traveled in its picking operation. The method developed utilizes product dimensions and volumes as well as system attributes and constraints. By using the method developed in this research, the cost incurred by traveled distance can be reduced by up to 48%. Finally, the method is shown to be successful in real world application through a comprehensive case study performed in an actual distribution warehouse.