ABSTRACT

This study originates from the issue of inventory buildup in the warehouse of PT ABC, which is caused by an unstructured *layout* and the lack of consideration for actual shipping patterns. This leads to inefficient picking processes due to increased travel distances between storage locations. The objective of this research is to identify item association patterns using the Apriori algorithm and to provide recommendations for warehouse *layout* improvements. The Apriori algorithm is implemented using Google Colab with a minimum *support* of 0.30 (30%) and a minimum *confidence* of 0,50 (50%). The results show that item pairs such as mechanical components, spare parts, and fasteners have a strong association with the *lift*, with a *lift* value of 1.68, indicating that these items are frequently shipped together. These values were also verified through manual mathematical calculations, yielding identical results and confirming the validity of the model. The recommended *layout* was designed by considering frequently associated item pairs and the movement classification of items based on FSN (fast, slow, non-moving). Evaluation was conducted using *rectilinear* distance calculations, which showed a reduction in total travel distance from 45.952 to 44.343. This demonstrates that the application of data mining using the Apriori algorithm can practically improve warehouse management efficiency and accelerate the distribution process at PT ABC.

Keywords: Apriori algorithm, data mining, warehouse *layout*, FSN (fast, slow, non-moving), rectilinear.