ABSTRACT

PT XYZ is a company engaged in the retail industry and markets Fast Moving Consumer Goods (FMCG) products and has a DC warehouse in Bandung. PT XYZ's DC warehouse has a processing time problem from picking activities that still exceeds the company's standard limits. That is because the retrieval policy that causes the batch on the picking list is not optimal. Therefore, a batch, sequence, and route design is performed in the picking process.

The problem of batching orders is an NP-hard problem. NP-hard is a problem that cannot be solved in a polynomial time span. Therefore, metaheuristic method is used to solve this problem. Genetic Algorithm (GA) is used to solve the problem in this study because this problem refers to population based. Then do the design of batches, sequences, and routes. Batches are limited by the capacity that can be carried by the operator. Sequence is the order in which the order will be taken at what position. Then, the item picking route in the batch adopts the concept of traveling salesman problem, which means that in one batch or one item picking tour is one tour that connects all points of location and each location in the batch can only be visited once.

The results of the design of batches, sequences, and routes in this proposal show that the batch size does not exceed the carrying capacity owned by the picking cart in a tour. Performing order sequences that produce late order data at the proposed conditions of 151 orders and is a better result than the existing conditions of 2746 orders. The total processing time required for the proposed improvement is 13:14:06 and is a better result than the existing condition of 17:27:24. Based on this, the proposals given are better than existing ones.

Keywords: *order picking, batching, sequencing, routing.*