

INTISARI

Penentuan keputusan yang efektif dan efisien terkait sistem rantai pasok merupakan hal yang sangat penting. Hal tersebut mengingat dampak besar yang dihasilkan yaitu dapat berupa keuntungan ataupun kerugian. Salah satu model yang dapat digunakan untuk memberikan keputusan yang baik tersebut yaitu *Location Routing Problem* (LRP). LRP merupakan model yang digunakan untuk optimasi sistem rantai pasok dengan penentuan pusat fasilitas dan rute kendaraan secara simultan. Pada penelitian ini, model LRP tersebut kemudian dikembangkan dengan nama *Multiobjective Multi Compartment Split Delivery Location Routing Problem With Time windows* (MOMCSDLRPTW). Adapun karakteristik tambahan yang dipertimbangkan yaitu berupa *multi compartment vehicle*, *split delivery*, *time windows*, dan *capacitated DC*.

Adapun fungsi tujuan yang ingin capai disini yaitu berupa minimasi total biaya dan maksimasi *service level*. Total biaya disini terdiri dari tiga komponen yaitu biaya tetap DC, biaya tetap kendaraan, dan biaya variabel transportasi. Kemudian *service level* disini merupakan tingkat kepuasan *retailer* terhadap pelayanan yang dilakukan kepadanya. Dalam perhitungannya, *service level* mempertimbangkan *soft time windows* dan waktu toleransi pelayanan *retailer*.

Setelah model berhasil dikembangkan, selanjutnya dilakukan analisis antara model yang mempertimbangkan *Split Delivery* (SD) dan *Unsplit Delivery* (UD). Analisis dilakukan dengan membandingkan fungsi objektif, *paretofront*, kontribusi komponen biaya terhadap total biaya, utilitas *Distribution Center* (DC) dan Kendaraan.

Kata kunci : *location routing problem, split delivery, multi compartment, service level, time windows, Non-dominated Sorting Genetic Algorithm (NSGA) II*

ABSTRACT

Effective and efficient decision making related to the supply chain system is very important. This is because of the large impact that can be in the form of profit or loss. One of the models that can be used to make good decisions is the Location Routing Problem (LRP). LRP is a model used for supply chain system optimization by determining the facility center and vehicle routes simultaneously. In this study, the LRP model is developed under the name Multiobjective Multi-Compartment Split Delivery Location Routing Problem With Time windows (MOMCSDLRPTW). The additional characteristics considered are multi-compartment vehicles, split delivery, time windows, and capacitated DC.

The objective function to be achieved here is in the form of minimizing the total cost and maximizing the service level. The total cost here consists of three components, namely DC fixed costs, vehicle fixed costs, and transportation variable costs. Then the service level here is the level of retailer satisfaction with the services provided. In the calculation, the service level considers the soft time windows and the retailer service tolerance time.

After the model has been successfully developed, further analysis is carried out between the models that consider Split Delivery (SD) and Unsplit Delivery (UD). The analysis is carried out by comparing the objective function, Pareto front, the contribution of the cost component to the total cost, Distribution Center (DC), and Vehicle utilities.

Keywords : *location routing problem, split delivery, multi compartment, service level, time windows, Non-dominated Sorting Genetic Algorithm (NSGA) II*