INTISARI

Distribusi merupakan kunci yang mengarahkan keuntungan dari suatu perusahaan karena berpengaruh secara langsung terhadap pengalaman pelanggan dan biaya rantai pasok. Dengan semakin berkembangnya penelitian, perancangan distribusi dapat diselesaikan secara simultan dan terintegrasi melalui konsep *location routing problem*. Aspek waktu dalam *location routing problem* mulai dipertimbangkan agar perusahaan dapat bersaing dalam kualitas pelayanan. Selain itu, perkembangan *location routing problem* mulai disarankan untuk membahas pendekatan *multi-objective*. Penelitian tentang *multi-objective location routing problem with time windows* masih terbatas, maka dari itu pengembangan dan pengujian model dengan objektif biaya dan *service level* perlu dilakukan.

Model pada permasalahan ini dirancang dengan menggunakan metode eksak *goal programming* dan diselesaikan dengan *software* LINGO 18.0. Model kemudian diuji pada kasus skala kecil dengan 12 titik yang terdiri dari 4 kandidat distribusi dan 8 titik *retailer*. Digunakan 3 jenis kendaraan yang berbeda untuk mengetahui jumlah dan tipe kendaraan yang tepat untuk mendapatkan hasil optimal. Hasil tersebut kemudian dibandingkan dengan pembobotan objektif dan variasi jarak yang berbeda.

Dari penelitian ini dihasilkan model *multi-objective location routing problem with time windows* yang dapat memberikan set solusi penentuan kandidat distribusi, moda transportasi, dan rute yang berbeda pada setiap skenario. Dengan menggunakan model ini, pertukaran nilai dari objektif biaya dan *service level* dapat ditunjukkan dan diketahui bahwa jarak dan pembobotan objektif dapat mempengaruhi keputusan.

Kata kunci: *location routing problem*, *multi-objective*, *time windows*, *service level*, *goal programming*

ABSTRACT

Distribution is a key factor for company to obtain profit as it directly impacts customer's experience and overall supply chain cost. As research become more advanced, network design can be solved simultaneously in an integrated way using location routing problem concept. Time aspect has been considered a lot in location routing problem to bring better service level for a company. Moreover, research regarding location routing problem has advanced much so that research has been advised to take on multiple-objective approach. Researches involving multi-objective location routing problem with time windows are not available much, therefore developing and testing a model that satisfy the problem with multiple objectives such as cost and service level is at most important.

The model for this specific problem is designed using goal programming method and simulated with LINGO 18.0 software. For instances, there are 12 nodes consisting of 4 distribution centers and 8 retailers. Three type of vehicles are used to analyze the amount and type needed to get the optimal result. Comparison of the result with different weight for each objectives and different overall distance are held.

This research has brought a modelling of multi-objective location routing problem with time windows which gives a set of solutions for deciding the right distribution center, vehicles, and routes depending on the scenario considered. Through this model, trade-off between cost and service level is shown and the result also conclude that distance and weight of objectives can impact the optimal decision inferred.

Keywords: *location routing problem, multi-objective, time windows, service level, goal programming*