

ABSTRACT

Transportation is a very important factor in logistic area. This activity supports the company for distributing the product to all of its costumers. Delay in delivery can be fatal for the company, beside s the company could not get the money from it, it can reduce the service level. Increase of the transportation cost is one of the main factors that push the company to think how to make an effective and efficient transportation planning. One of the problems in transportation is vehicle routing problem, this is a problem where the company has to think about effective and efficient route for distributing products. CV. XYZ is a company that engaged in the field of logistics, this company provide a warehouse for storing products and transportation service for distributing the products. CV. XYZ handle nestle's product. The problem that happened in CV. XYZ is that this company could not distribute it's product to few customers due to late delivery. This is a vehicle routing problem that concern fleet size and mix vehicle, time window and multiple product.

This study discusses VRP with fleet size and mix, time window and multiple product characteristic with the aim of minimize the delay and also transportation cost. VRP enter into the issue of hard-combinatorial with NP-hard characteristic so that basically VRP is solved with metaheuristic method such as genetic algorithm which is also used in this study. This algorithm started with using the nearest neighbour algorithm to get initial population and then carried out on the reproductive processes of genetic algorithm such as elitism, crossover and mutation.

Result of this algorithm can optimize vehicle utilities so that can reduces the number vehicle used, eliminate delays and also reduce total transportation cost up to 6.03%.

Key Words : Transportation and Distribution, Vehicle Routing Problem, Genetic Algorithm, Fleet Size and Mix, Time Window, Multiple Product.