

ABSTRACT

In the transportation process is closely related to the route, the route is the path through which a mode / vehicle to arrive at a destination. The route is related to the number of vehicles and the location where it goes. PT XYZ is a company engaged in fast moving consumer goods (FMCG), with the field makes the flow of goods speed will be high until the goods distribution process becomes fast and often. In the process of distribution is done by using 1 fleet in each customer. Currently in the process of distributing goods, the company still ignores the utility of the vehicles used, so the availability of empty space in capacity is still occurring and this makes the cost of transportation is high. Consolidation of multiple customers becomes possible, keeping in mind the time window, capacity and multiple products.

This study designs a route by considering the limits to get the route, the number of vehicles, the utility increase of each vehicle and the optimal distance so that it can minimize transportation costs. The use of a genetic algorithm preceded by the nearest neighbor algorithm is used to solve this problem. Later the route will be formed and get the number of vehicles, the increase in vehicle utility and the optimal distance. This resulted in average vehicle utility improvement of 35,317%, vehicle repairs amounted to 34.05%, and distance of 10.075% so as to reduce transportation costs by 26.56% from initial conditions.

Keywords: Transportation, FMCG, vehicle routing problem, time window, heterogeneous fleet, vehicle number determination.