

Penerapan metode algoritma memetika pada penyelesaian Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL) = Applications of memetic algorithm method on solving Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL)

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Abstrak

Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL) merupakan permasalahan pencarian rute dengan setiap pelanggannya memiliki lebih dari satu pilihan lokasi pengiriman. Dalam penelitian ini, pengiriman bisa dilakukan ke rumah pelanggan (home delivery) atau ke lokasi cadangan milik pelanggan (roaming delivery). Digunakan metode Algoritma Memetika untuk menyelesaikan VRPRDL pada penelitian ini. Algoritma Memetika bekerja dengan cara melakukan operasi genetika pada sepasang solusi dari sebuah populasi (kumpulan solusi feasible), kemudian mengolah solusi yang dihasilkan dari operasi genetika ke dalam proses local search. Data yang digunakan berupa 30 pelanggan dengan masing-masing pelanggan memiliki 2 lokasi. Dengan ukuran populasi (popsize) sebesar 10 individu, jumlah generasi sebesar 50 generasi, crossover rate (Cr) sebesar 0.3, dan mutation rate (Mr) sebesar 0.3 pengiriman menggunakan sistem roaming delivery mampu menghemat biaya sebesar 17.45% jika dibandingkan dengan pengiriman tradisional home delivery. Selain itu, pengiriman menggunakan sistem roaming delivery hanya memerlukan 4 kendaraan pengiriman, lebih sedikit dibandingkan home delivery yang memerlukan 5 kendaraan.

.....Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL) is a routing problem where each customer has more than one choice of delivery locations. Hence, it is necessary to determine the right location for delivery. In this study, delivery can be made to the customer's home (home delivery) or the customer's backup location (roaming delivery). The Memetics Algorithm method will be used to solve VRPRDL in this study. The Memetics Algorithm works by performing genetic operations on a pair of solutions from a population (a set of feasible solutions), then processing the solutions generated from genetic operations into a local search process. The data we used are 30 customers with each customer having 2 locations. By using population size of 10 individuals, the number of generations of 50 generations, a crossover rate (Cr) of 0.3, and a mutation rate (Mr) of 0.3, shipments using a roaming delivery system can save costs by 17.45% when compared to traditional home delivery. In addition, delivery using a roaming delivery system only requires 4 delivery vehicles, less than home delivery which requires 5 vehicles.