

# Penerapan metode algoritma genetika pada penyelesaian Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL) = Application of genetic algorithm method in solving Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL)

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## Abstrak

Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL) adalah masalah pencarian rute pengiriman barang yang optimal dengan mempertimbangkan lokasi pengiriman ke rumah pelanggan (home delivery) atau lokasi cadangan lain yang telah ditunjuk oleh pelanggan (roaming delivery). Jenis pengiriman tersebut dapat menjadi inovasi bagi pihak logistik dalam proses akhir pengiriman barang hingga sampai pada pelanggan (last mile delivery). Kerugian-kerugian seperti pencurian barang ataupun kerusakan barang karena pelanggan tidak berada di rumah dapat dihindari dan biaya operasional pengiriman dapat diminimalkan. Pada skripsi ini, digunakan metode algoritma genetika untuk mencari solusi dari VRPRDL. Data untuk simulasi percobaan terdiri dari 1 lokasi depot dan 30 pelanggan dengan masing-masing pelanggan memiliki 2 lokasi pengiriman yaitu 1 lokasi rumah dan 1 lokasi cadangan. Lokasi-lokasi pelanggan dan depot yang digunakan berada di provinsi DKI Jakarta. Hasil percobaan dengan menggunakan ukuran populasi 30, jumlah generasi 100, crossover rate (Cr) 0.7, dan mutation rate (Mr) 0.5 menunjukkan adanya penghematan total biaya menggunakan roaming delivery sebesar 18,90% dibandingkan dengan home delivery.

.....Vehicle Routing Problem with Roaming Delivery Locations (VRPRDL) is the problem of finding the optimal route for delivery of goods by considering the delivery location to the customer's house (home delivery) or other backup locations designated by the customer (roaming delivery). This type of delivery can be an innovation for logistics in delivering goods to the customer's last location or last-mile delivery. Such loss like theft of goods or damage to goods because the customer is not at home, can be avoided, and the operational shipping cost can be minimized. In this thesis, a genetic algorithm method is used to find a route solution for the problem. The data for the experimental simulation consists of 1 depot location and 30 customers with each customer having 2 delivery locations, namely one home location and one backup location. The locations of customers and depot used are in the province DKI Jakarta. The experimental result by using a population size of 30, the number of generations of 100, crossover rate (Cr) 0.7, and mutation rate (Mr) 0.5 indicates a total cost saving of using roaming delivery for 18.90% compared to home delivery.