

PENENTUAN PENJADWALAN DAN RUTE DISTRIBUSI PRODUK YANG OPTIMAL MENGGUNAKAN MODEL VEHICLE ROUTING PROBLEM DENGAN METODE SAVING MATRIX, SEQUENTIAL INSERTION, DAN NEAREST NEIGHBOUR DI PT XYZ

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Abstrak

Permasalahan dalam transportasi adalah *Vehicle Routing Problem* (VRP). Salah satu jenis dari *Vehicle Routing Problem* (VRP) adalah *Capacitated Vehicle Routing Problem* (CVRP) yaitu VRP yang memiliki batasan kapasitas kendaraan. Penjadwalan pengiriman harian di PT XYZ berdasarkan pesanan yang ada untuk setiap harinya. Rute pengiriman harian pun akan berbeda sesuai dengan pesanan dari pelanggan. Oleh karena jumlah permintaan yang tidak menentu tersebut, maka ada kalanya kapasitas kendaraan tidak mencukupi dan ada kalanya tidak terutilitas secara penuh. Tujuan penulisan Tugas Akhir ini adalah membentuk model VRP untuk rute distribusi di PT XYZ, menyelesaikannya menggunakan *saving matrix*, *sequential insertion* dan *nearest neighbour*, serta mengetahui penyelesaian VRP yang paling efektif dari ketiga metode tersebut.. Metode *saving matrix* menggunakan nilai penghematan (*saving*). Metode *sequential insertion* memiliki kelebihan dalam penentuan lokasi penyisipan, sedangkan metode *nearest neighbour* mempertimbangkan jarak yang terdekat. Berdasarkan perhitungan yang dilakukan dalam menyelesaikan VRP menggunakan metode *saving matrix*, diperoleh total jarak tempuh yaitu 2.061,95 km, dengan metode *sequential insertion* diperoleh total jarak tempuh yaitu 2.322,85 km, dan dengan metode *nearest neighbour* diperoleh total jarak tempuh yaitu 2.365,45 km. Sedangkan total jarak tempuh perusahaan saat ini yaitu 3.140,9 km. Hal ini menunjukkan bahwa metode *saving matrix* lebih efektif dalam menentukan rute distribusi di PT XYZ.

Kata Kunci : *Vehicle Routing problem, Capacited Routing Problem, Saving Matrix, Sequential Insertion, Nearest Neighbour.*

***DETERMINATION OF OPTIMAL PRODUCT SCHEDULING AND
DISTRIBUTION USING VEHICLE ROUTING PROBLEM MODELS
WITH THE SAVING MATRIX, SEQUENTIAL INSERTION, AND
NEAREST NEIGHBOR IN PT XYZ***

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Abstract

The problem in transportation is the Vehicle Routing Problem (VRP). One type of Vehicle Routing Problem (VRP) is Capacitated Vehicle Routing Problem (CVRP), which is VRP which has a limited capacity of the vehicle. Daily delivery scheduling at PT XYZ based on the orders that exist for each day. Daily shipping routes will differ according to orders from customers. Because of the uncertain number of requests, there are times when vehicle capacity is insufficient and there are times when it is not fully utilized. The purpose of writing this Final Project is to form a VRP model for distribution routes at PT XYZ, solve it using a saving matrix, sequential insertion and nearest neighbor, and find out the most effective VRP settlement of the three methods. The saving matrix method uses savings. The sequential insertion method has advantages in determining the insertion location, while the nearest neighbor method considers the closest distance. Based on calculations performed in completing VRP using the matrix saving method, a total mileage of 2,061.95 km was obtained, with the sequential insertion method a total distance of 2,322.85 km was obtained, and with the nearest neighbor method a total mileage of 2,365.45 km was obtained. While the company's total mileage is 3,140.9 km. This shows that the saving matrix method is more effective in determining the distribution route at PT XYZ.

Keyword: *Vehicle Routing problem, Capacited Routing Problem, Saving Matrix, Sequential Insertion, Nearest Neighbor.*