

ABSTRACT

UD XYZ is a gondorukem producer that supplies batik and malam craftsmen in Pekalongan City, Pekalongan Regency, Pemalang Regency. Currently, the company carrying out the distribution process by determining the route manually. This causes distribution costs incurred by the company to be 16% higher than the limit. In the distribution process, the company only uses one vehicle so that the vehicle has several delivery tours. Thus, the company's problems are included in the Vehicle Routing Problem with Multiple Trips. In this research, the distribution route design is carried out to solve the problems that occur in the company.

Saving Matrix is a method that combines two locations into a route to minimize the distance by considering the existing constraints. There are four stages of completion of the Saving Matrix, namely the identification of the distance matrix, the identification of the saving matrix, the allocation of consumers into routes, and the sequencing of routes. In order of route, this research uses dynamic program approach, nearest neighbor, and nearest insertion.

Based on the results of data processing, it was found that the largest decrease occurred in the distribution route design using the Saving Matrix dynamic program approach. There was a decrease in mileage by 25.91%, from 184.44km per week to 136.65km per week. In terms of distribution costs, there was a decrease of 15.16%, from Rp241,096.60 per week to Rp204,537.25 per week.

The design results are then verified and validated to ensure that the design results are in accordance with company specifications and requirements. Then, a feasibility analysis of the design implementation is carried out to determine the feasibility of the design results to be implemented by the company. The results of the feasibility analysis of the design implementation state that the results of the proposed distribution route design in this final project are feasible to be implemented.

Keywords — [distribution route, vehicle routing problem, multiple trips vehicle routing problem, saving matrix]