

ABSTRACT

PT SB is an industrial company engaged in the production of food ingredients, namely panir flour which has been established since 2007 and is able to sell its products throughout Indonesia. CV ULI is one of the distributors appointed by PT SB to be able to distribute the panir flour on the island of Sumatra and PT SB provides distribution targets in each region. CV ULI distributes panir flour in six regions on the island of Sumatra, namely Palembang, Jambi, Padang, Pekanbaru, North Sumatra and Aceh. However, of the several regions covered by CV ULI, North Sumatra, especially Medan City, has not been able to achieve the target set by PT SB.

After further identification, the distribution target of each salesman in Medan City did not reach the target limit set by PT SB. The main factors causing the non-achievement of the target number of salesman visits are the sales/distribution of products that have not been maximized and the inadequate mapping area and time territory management. This research has a problem formulation, namely determining the optimal route for CV ULI to meet the predetermined target.

Distribution is a marketing activity that aims to facilitate the delivery of products from producers to consumers. The role of the distributor in this case is to create value and transfer ownership of the product. Therefore, distribution is an activity that increases the value of products and services and added value representing use value, place and time. This research begins with the author conducting a field study at CV ULI and a literature study to be able to solve existing problems by setting research boundaries. The author also collects primary data obtained from the company and secondary data obtained from google maps related to distance, time and outlet location points.

In data processing, this research uses the Vehicle Routing Problem (VRP) model of the Capacitated Vehicle Routing Problem with Time Windows (CVRPTW) variant because solving problems at CV ULI involves determining the optimal route so that vehicles can visit all customer location points with available working time. In VRP, this research uses the Integer Linear Programming (ILP) approach

with VRPy (VRP-yields) software with a python library specifically designed to solve VRP problems.

After the primary data is successfully obtained, the next design begins with a search for the distance and travel time of each sub-district covered by each salesman through google maps to update or recheck the order of each salesman's pre-existing sub-districts. After that, the search for outlet routes is based on distance and travel time, service time, work time, number of outlets. Then in ILP, variables can also be defined as decision making. In the VRPy used to get the best routes for each salesman, there are variables used and restrictions to be able to take routes. After the best route by each salesman is obtained, the author calculates the expected fulfillment if this design is implemented.

The results of determining this route can have a significant positive impact on achieving the target number of salesman visits so as to achieve the distribution target. This is also evidenced by the comparison of initial conditions and proposed conditions with a percentage of achievement that not only reaches the predetermined target but also increases by 61% from the previous percentage of achievement after determining the route of each salesman. With the proposal made by the author, it can provide benefits to CV ULI to be able to fix the problems that exist in the company.

Keywords: Distribution, Salesman, Vehicle Routing Problem, Route Determination