ABSTRACT

Transportation is an activity to move from one place to another. It is an important process in industry, specifically to deliver products from a company to its customers. But, it doesn't give any additional values to the products, in fact it costs the company a lot. Therefore, it has to be done as minimum as possible.

PT Sumber Alfaria Trijaya Cileungsi is an Alfamart distribution center that has a duty to deliver goods from its warehouse to 298 Alfamart outlets around North Jakarta, East Jakarta, Central Jakarta, and Bekasi every day. But, the existing distribution system doesn't have an exact calculation to decide the delivery routes. They are just made based on a schedule that shows which 2 outlets become the destinations. Consequently, they produce a large number of distance and there is still so much empty space in the truck because it just make a combination of 2 outlets as the destinations for every route. It should add more outlets, but again, it doesn't have a system to calculate the total volume of outlet's demand.

Design of the application uses a formulation that has an objective function to minimize the total distance for every route and total volume of outlets' demand combination must not exceed truck capacity as the main constraint, as the core of it. It also uses Tabu Search Algorithm as the method to find the objective function.

This research uses 4 main data. Those are items data, outlets data, distance matrix data, and truck volume. Demand data can be derived from items data and outlets data. Coordinate data can be derived from distance matrix data. Truck capacity can be derived from truck volume and allowance.

After the outlets send their demand list, system will calculate the total volume of demand for each outlet. Together with truck capacity and coordinate data, it will be used as input for optimal routes searching process using Tabu Search Algorithm as the method based on the formulation.

Key Words : Transportation, Distribution center, Application, Tabu Search Algorithm