

ABSTRACT

PT XYZ is a large company engaged in the automotive component industry. One of core business of PT. XYZ is the provision of spare parts. One of the components produced by PT. XYZ between them is a stabilizer and spring. In the distribution to reach the customer, PT XYZ sends its products based on the number of orders requested by the customer. PT XYZ uses 1 fleet for 1 customer on delivery because there are customers who use service time window with certainty and there are customer using range time window. Because there is no good system so PT XYZ has delay in delivery.

The problems that occur in PT XYZ is a common problem in the field of transportation and can be solved by using Vehicle Routing Problem. VRP characteristics that occur in PT XYZ is VRP with time window and Multiple Trip. These characteristics will assist in the delivery and assist in the settlement using Branch and Bound algorithm. Where in Branch and Bound is an exact algorithm.

The Branch and Bound algorithm is able to generate the total cost of Rp 1,283,345.67 or 23% compared to the total cost of the existing. The route obtained based on Branch and Bound algorithm can result in decrease of distance and travel time by 13.19% from the existing condition.

Keywords: *spare parts, Vehicle Routing Problem, Multiple Trip, branch and bound, global optimum.*