World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:16, No:06, 2022

Optimization of Lubricant Distribution with Alternative Coordinates and Number of Warehouses Considering Truck Capacity and Time Windows

Authors : Taufik Rizkiandi, Teuku Yuri M. Zagloel, Andri Dwi Setiawan

Abstract : Distribution and growth in the transportation and warehousing business sector decreased by 15,04%. There was a decrease in Gross Domestic Product (GDP) contribution level from rank 7 of 4,41% in 2019 to 3,81% in rank 8 in 2020. A decline in the transportation and warehousing business sector contributes to GDP, resulting in oil and gas companies implementing an efficient supply chain strategy to ensure the availability of goods, especially lubricants. Fluctuating demand for lubricants and warehouse service time limits are essential things that are taken into account in determining an efficient route. Add depots points as a solution so that demand for lubricants is fulfilled (not stock out). However, adding a depot will increase operating costs and storage costs. Therefore, it is necessary to optimize the addition of depots using the Capacitated Vehicle Routing Problem with Time Windows (CVRPTW). This research case study was conducted at an oil and gas company that produces lubricants from 2019 to 2021. The study results obtained the optimal route and the addition of a depot with a minimum additional cost. The total cost remains efficient with the addition of a depot when compared to one depot from Jakarta.

Keywords : CVRPTW, optimal route, depot, tabu search algorithm
Conference Title : ICIE 2022 : International Conference on Industrial Engineering
Conference Location : Rome, Italy
Conference Dates : June 02-03, 2022