

## ABSTRACT

The *Traveling Salesman Problem* (TSP) often arises in the context of optimizing the route that a salesman must take to visit a number of cities with the minimum possible mileage and fuel cost. In the context of fuel oil distribution using tankers, the projected route search often does not contain the most minimal mileage, which can lead to adverse results such as significant additional costs. This is due to several factors, such as lack of consideration of all possible routes, incidental factors, and unforeseen events.

This research analyzes four different routes using several iterative proposals to reduce travel distance, time, and fuel costs compared to actual conditions. The analysis results show that all proposed iterations were able to provide significant reductions in all three aspects. The four research routes achieved optimization results of 11.6% compared to the actual route modeling. This optimization proves that the iterative methods applied can substantially improve operational efficiency.

The analysis on the case study of two tankers described earlier shows that of the four fuel oil distribution routes, the distance and time required are quite large, resulting in high fuel consumption. By searching for the optimal route, the distance and travel time can be minimized so that fuel consumption is reduced. Route optimization not only considers the shortest distance, but also the fuel cost incurred, which is an important component in route determination.

This problem has an impact on the various components considered when determining the tanker route by PT XYZ. Therefore, the determination of the tanker route must consider all the possibilities required in determining the route. The optimal route created is expected to have a new model with the aim of minimizing fuel costs based on the smallest distance and time calculations.

**Kata Kunci: Traveling Salesman Problem, Brute Force, Minimize Total Fuel Oil Cost, Route Optimization**