ABSTRACT

The application of the Travelling Salesman Problem (TSP) method in designing efficient truck routes to enhance supply chain management at PT. MARABUNTA YKEP. As a key factor in the success of the truck logistics industry, efficiency in supply chain management is crucial. By utilizing the TSP method, this research has two main objectives: first, to implement the TSP method, particularly through the Brute force algorithm, to design optimal truck routes; and second, to evaluate the extent to which the TSP-based truck route optimization system can reduce order reassignment costs in the company. This study takes a quantitative descriptive approach to provide an overview and explain the benefits of the proposed route optimization system.

The Brute force approach from the TSP method is employed in this research, and the results indicate a reduction in routing costs by 22.44% compared to the actual routes. However, it should be noted that there is an increase in travel distance by approximately 22.46%. The conclusion of this study emphasizes the importance of selecting a route optimization method that aligns with the specific characteristics of the case. While Brute force may be the optimal choice, the implementation of the TSP method with other approach as a whole can still be considered an effective solution to improve operational efficiency and reduce order reassignment costs at PT. MARABUNTA YKEP.

As a result of this study, it is crucial for the company to consider more advanced or context-specific route optimization methods. Although TSP provides a solid framework, the use of other more efficient algorithms that are relevant to the company's characteristics may be more beneficial in achieving operational efficiency and reducing order reassignment costs.

Keywords: *TSP, Brute force, Order Delivery Costs*