ABSTRACT

Distribution constitutes a critical component of the marketing mix, referring to cost-effective and timely logistical activities that facilitate product delivery from producers to end consumers. UD Berkah Mandiri Makmur, a trading enterprise specializing in the distribution of culinary raw materials, faces challenges in logistics cost inefficiency due to suboptimal distribution route planning. The inefficiency in route scheduling has led to significant operational cost escalations, adversely affecting the company's profitability.

This study aims to analyze and optimize daily distribution routes through the implementation of the Saving matrix algorithm. The research problem focuses on formulating route patterns that minimize travel distance and operational costs by integrating customer and depot location data. The Saving matrix method was selected for its capability to calculate saving values between distribution nodes, enabling the generation of optimal visitation sequences. The research methodology includes: (1) geographical data collection of customer and depot locations, (2) distance calculation between nodes using Google Maps API, (3) formulation of a saving matrix, (4) verification of distance data accuracy, and (5) validation of simulated routes. A comparative analysis was conducted to evaluate the performance of existing routes against optimized routes in terms of travel distance and fuel consumption.

The findings demonstrate that the Saving matrix implementation reduced the weekly total distribution distance from 431 km to 354 km, achieving a 17.9% efficiency improvement. This distance reduction translated to a 14% decrease in weekly fuel costs, from IDR 2,760,000 to IDR 2,375,000. These results indicate that the method not only systematizes distribution sequences but also significantly enhances logistical efficiency. Thus, the Saving matrix has been empirically validated as a feasible solution for improving distribution operational performance at UD Berkah Mandiri Makmur, providing strategic recommendations for supply chain management decision-making.

Key Words: *Distribution, Distribution Route Planning, Cost Efficiency, Saving matrix*