A Comparison of the Weighted Product (WP), Simple Additive Weighting (SAW), and Technique for Order Preference by Similarity to the Ideal Solution (TOPSIS) Approaches to Determine the Best Distribution Route

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Abstract

Consumer demands for quality, product, pricing, better service, quick delivery, and product availability on the market are increasing. To distribute items and services in the correct place, with the right quality, price, and timing, proper distribution is required. Distribution, in broad terms, can be defined as a marketing activity that seeks to expedite and facilitate the delivery of goods and services from producers to consumers, so that they can be used as needed (type, quantity, price, place, and time required), because once the goods are made and ready to be marketed, the next stage in the marketing process is to determine the methods and routes that will be used to deliver the goods to the market. A method is required to be able to convey items effectively and efficiently while picking the optimum route for shipping goods. This study attempts to utilize the Multiple-Criteria Decision-Making (MCDM) approach in selecting the optimum path. So, utilizing the Weighted Product (WP) way, the Simple Additive Weighting (SAW) Method, or the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), this study attempts to establish the most effective way for product distribution. Distance (km), trip time (minutes), quantity of Order (kg), cost (Rp), and amount of fuel (liters) are the factors that may be utilized to calculate the distribution route based on the study findings. Based on the Weighted Product (WP) approach calculation findings, a value of 177.10 Km is obtained. The Simple Additive Weighting (SAW) approach yielded a result of 201.08 Km. The best approach, with a total distance of 175.80 Km, is the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). The Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) technique with a fuel cost of IDR 127,174.47 is the best method based on the calculation findings. The optimum technique, based on the calculation findings, is the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method.

Keywords
MCDM, Decision Making, Route Determination, WP, SAW, and TOPSIS.