ABSTRACT

This study aims to analyze and propose a supplier selection strategy for pouch packaging used in Teh Tin products at CV ABC by employing the Analytical Hierarchy Process (AHP) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) approaches. Selecting the right supplier is a crucial factor in maintaining product quality, cost efficiency, and the sustainability of the company's supply chain. CV ABC is a small-to-medium enterprise (SME) located in Jember Regency, East Java, producing tea beverage products. One of the challenges faced by CV ABC in procuring packaging materials is the high defect rate in packaging, resulting in up to 15% of rejected items from suppliers. This figure significantly exceeds the company's tolerance threshold of 5%. Additionally, CV ABC does not yet have a structured set of criteria to objectively evaluate and select suppliers.

In response to this issue, the research raises the following problem statements: What criteria and sub-criteria are necessary for supplier selection at CV ABC? What is the priority weight order of each criterion and sub-criterion that influences supplier selection? What is the supplier ranking that can serve as a reference for CV ABC in choosing suppliers? This study is limited to proposing solutions for pouch packaging supplier selection, involving only three current pouch packaging suppliers, and focusing solely on pouch-type packaging issues.

To address the problem, the initial step taken was to interview the owner of CV ABC to determine the appropriate criteria for supplier selection. These criteria were derived from previous literature and selected based on the business owner's considerations. Once the relevant criteria were finalized, a multi-criteria decision-making method AHP and TOPSIS was employed. AHP was used in the first stage to determine the weight of each criterion based on its importance level. The primary criteria considered in the supplier selection process included quality, price, delivery, flexibility, and reliability. These criteria were established based on the company's operational needs and management priorities. The weighting process was carried out through a pairwise comparison technique, followed by a consistency check to validate the assessments.

The results of the AHP method showed that the price criterion had the highest weight (0.4552), followed by quality (0.2313), delivery (0.1701), flexibility (0.0897), and reliability (0.0534).After determining the weights of the criteria, the next stage involved applying the TOPSIS method to assess the three existing supplier alternatives used by CV ABC. TOPSIS was chosen for its ability to evaluate alternatives based on their relative closeness to the ideal solution. This method includes steps such as normalizing the decision matrix, applying weights, determining positive and negative ideal solutions, and calculating the distance from each alternative to these solutions.

The results revealed that Supplier 1 had the highest preference score (0.6279), followed by Supplier 2 (0.5970), and Supplier 3 (0.3511). Therefore, Supplier 1 is recommended as the primary supplier for the company.

Although all three suppliers exhibited a similar reject rate, the method's results indicate that Supplier 1 is the most optimal overall, based on the five main criteria. Hence, it is crucial for the company to conduct periodic evaluations of the selected suppliers to ensure continuous improvement in quality. This research is expected to contribute to CV ABC's management in making strategic decisions that directly impact supply chain success and production sustainability, especially in supplier selection.

Keywords: ***Supplier Selection, Pouch Packaging, Analytical Hierarchy Process (AHP), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS)***