ABSTRACT

CV XYZ is a macro-enterprise operating in garment industry, which faces challanges in selecting supplier due to the absence of a clear system or evaluation standard. Supplier selection has been based on personal experience without proper weighting of criteria, leading to inconsistent fabric quality and delivery delays. In addition, internal data from 2024 show that problematic payments occured 9 times, difficulty contacting suppliers in urgent situations occured 8 times, incorrect materials were received 7 times, lack of return services occured 8 times, incorrect materials were received 7 times, lack of return services occured 4 times, and delivery delays occured 3 times. To identify the root causes of these issues, a fishbone diagram analysis was conducted. The result indicate that the core problems lie in the absence of a supplier selection system, the use of non-spesific criteria, and the subjective nature of the evaluations. Based on these problems, this study proposes the design of a supplier selection decision support system using the Analytical Hierarchy Process (AHP) to determine the weight of criteria and sub-criteria, and tge Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) to rank the suppliers. The result show five main criteria: quality, cost, delivery, communication, and warranty, with a total of a 12 sub-criteria. The highest weighted sub-criterion is quality cinsistency, with a weight of 19,9%. Out of seven suppliers, the top three rankings were obtained by Suppler C (0,7665), Supplier F (0,3652), and Supplier A (0,3270). Validation was conducted through interviews with the company's stakeholder and confirmed that the rankings aligned with supplier performance in practice. The system was developed using macro-based Microsoft Excel and successfully integrated all features for assessment, weighting, and automated calculations.

Keywords: Supplier Selection, Decision Support System, AHP, TOPSIS