ABSTRACT

Procuring raw materials is a key aspect of the production process for manufacturing companies. PT. XYZ, a plastic manufacturing company, heavily relies on suppliers to provide the necessary plastic raw materials. One of the products produced by PT. XYZ is the upper lens product, which is composed solely of Polymethil Methacrylate (PMMA) resin. However, in the procurement process, PT. XYZ still lacks a standardized supplier selection system and relies on subjective assessments. Currently, PT. XYZ collaborates with supplier X, who, based on lead time data, has frequently experienced delays in the last three months. With an average lead time delay of 4 days from the planned procurement day of 1 day, this significantly affects the production process and a fill rate of 32%. Thus, a measurement of selecting suppliers that are suitable and ideal in facilitating the production needs of the upper lens product is required.

The design of this measurement is carried out by combining the Analytic Network Process (ANP) and Data Envelopment Analysis (DEA) methods, which identify the level of priority of suppliers relevant to the supplier characteristics needed by PT. XYZ. From the analysis results, the identification of criteria and sub-criteria with the largest weights in the criteria aspect is 0.33 for the quality criterion, followed by the cost criterion with a weight of 0.28, the delivery criterion with a weight of 0.23, the quantity criterion with a weight of 0.10, and the flexibility criterion with a weight of 0.06. Meanwhile, for the sub-criteria aspect, the primary priority level is held by the sub-criteria of the percentage of defective products with a weight of 0.226, followed by the sub-criteria of competitive pricing with a weight of 0.202, then the sub-criteria of on-time delivery with a weight of 0.121, then the sub-criteria of the accuracy of specifications with a weight of 0.080, then the sub-criteria of the percentage of demand fulfillment with a weight of 0.062, then the sub-criteria of the suitability of product prices with a weight of 0.046, then the sub-criteria of changes in product delivery times with a weight of 0.041, then the sub-criteria of MOQ suitability with a weight of 0.033, then the sub-criteria of ease of price negotiation with a weight of 0.031, then the sub-criteria of quality consistency with a weight of 0.026, then the sub-criteria of FIFO system implementation with a weight of 0.019, then the sub-criteria of changes in product demand with a weight of 0.010, then the sub-criteria of the percentage of returned products with a weight of 0.009, and finally, the sub-criteria of the product change handling system with a weight of 0.004. With the overall efficiency level of alternative suppliers already optimal, the main priority order of alternative supplier importance is occupied by supplier E with a weight value of 4.8, followed by supplier A with a weight value of 4.5, then followed by supplier C with a weight value of 4.4, then supplier B with a weight value of 4.3, then supplier D with a weight value of 4.3, and lastly, the existing supplier

for PMMA material procurement, supplier X, with a weight value of 4.1. Thus, based on the evaluation results in the form of a priority ranking of alternative supplier recommendations, it is recommended for PT. XYZ to discontinue cooperation with supplier X and switch to other alternative suppliers with higher rankings. However, if in its implementation, the priority supplier does not meet the requirements and cooperation contracts or there are other considerations for not cooperating, PT. XYZ can choose suppliers in the next priority order.

Keywords – ***Procurement, Lead Time, Upper Lens, PMMA, ANP, DEA***