

## **ABSTRACT**

*PT XYZ is a fashion company that produces socks experiencing the problem of high defect rates in thumb sock products during the period June to November 2023. Despite high demand, the average defect rate reached 4.04%, exceeding the company's tolerance limit of 3%. From the six stages of sock production, namely knitting, obras, back and forth, oven, sorting, and packaging, there are several types of defects, such as holes, stains, downsizing, stripes, and raw materials. Pareto analysis shows that the most dominant type of defect is holes, with a defect rate of 33% coming from the knitting process. Based on this problem, the stages of the knitting process were analyzed using Failure Mode and Effect Analysis (FMEA). The failure modes with the highest Risk Priority Number (RPN) values are broken needles at 392 and broken needles at 336. Improvements are proposed based on the results of the FMEA prioritization analysis with the aim of improving the quality of the sock production process using the poka yoke method. The poka yoke method is an approach in production that aims to prevent product defects. The proposed improvements include the simultaneous replacement of needles according to their lifespan, assisted by an alarm sensor tool. This tool is designed to overcome the problem of using needles that are not replaced when their lifespan has expired. This tool can help the knitting process run optimally by replacing the needles simultaneously before their lifespan is exceeded. With this early detection and failure prevention, product quality can be improved and defects caused by needles in knitting machines can be reduced.*

**Key word — [Lean Manufacturing, defect, FMEA, poka yoke, sensor]**