

ABSTRACT

Adorable Projects is a company with a focus on selling women's fashion products, including shoes, sandals, bags, wallets, clothing, and accessories. Shoe products have the largest percentage of total purchase and holding costs, accounting for 64% of all products sold by Adorable Projects. The high purchase and holding costs for shoe products are due to high consumer demand, prompting the company to continuously supply shoes with various models. Currently, the decision to reorder and the order quantity are based solely on the decision maker experience, without considering other cost factors that affect the total inventory cost. Several factors causing the actual total inventory cost to exceed the company's set target include suboptimal inventory policies, the absence of demand forecasting leading to inventory levels exceeding demand, as well as lead time uncertainty and the lack of a fixed standard time for receiving products from vendors, which leads the company to place large orders to avoid inventory shortage.

Based on these issues, this final project designs an inventory policy for shoe products to determine the reorder point and optimal order quantity to minimize total inventory costs. The design process involves classifying items using ABC Analysis, identifying shoes in category A, which will be the focus of this final project. This process continues with a Poisson test of the demand data for category A shoes using the Anderson-Darling test with the aid of SPSS software. Subsequently, demand forecasting is conducted using several methods, including simple exponential smoothing, Holt's or double exponential smoothing, and linear trend methods. Next, calculations for mean demand lead time, variance demand lead time, and standard deviation demand lead time are performed. The following process involves calculating the inventory policy using the continuous review method (s, Q) considering lead time uncertainty. Sensitivity analysis is conducted on the optimal solution of the design with several parameters, namely purchase cost, ordering cost, holding cost, and shortage cost.

The classification process resulted in 98 shoe products categorized as A, contributing 80% of the costs. The demand data for category A is Poisson distributed. The demand forecasting conducted using several methods simple

exponential smoothing, Holt's or double exponential smoothing, and linear trend will be selected based on the smallest mean absolute percentage deviation (MAPD) result, resulting in different selected methods for each shoe. The proposed total inventory cost for the current year, decreased by Rp 2,006,595,105 or minimized by 20% from the actual total inventory cost. Meanwhile, the proposed total inventory cost for the next period, in 2024, increased by Rp 133,669,799 from the proposed total inventory cost in 2023, representing a 1% increase. After sensitivity analysis, it is known that the optimal solution is sensitive to changes in purchase cost parameters as they result in a significant percentage change. In contrast, ordering cost, holding cost, and shortage cost parameters are not very sensitive as their percentage changes are not significant.

Based on the calculations made, the proposed inventory policy design using the continuous review method (s, Q) considering lead time uncertainty can be concluded to help Adorable Projects determine the reorder point and optimal order quantity to minimize the total inventory cost at Adorable Projects. The reduction in total inventory cost is 20% or Rp 2,006,595,105. This design also resulted in an inventory policy design for the next period.

Keywords — inventory, inventory policy, continuous review, forecasting, inventory classification