ABSTRACT

PT XYZ is a retail company in Indonesia that operates in the FastMoving Consumer Goods (FMCG) sector. The products sold by PT XYZ are divided into 3 product categories, namely food 1, food 2 and non-food. In this research, product categories were chosen based on the largest percentage of stockout products. Product category selection is calculated based on several products experiencing stockout, which is then divided by the total number of products owned. With this, the largest stockout percentage was obtained by the non-food product category, namely 41%. Non-food category products experienced the greatest stock shortage compared to the other 2 product categories. Product stockouts that occur are caused by the gap between the amount of inventory and the amount of demand, where the amount of inventory data is less than the amount of demand data. PT XYZ's demand level in 2023 will fluctuate with low inventory levels. This happens because the inventory policy planning carried out is not optimal, causing a gap, namely stockout, high stockout will also cause high shortage costs. This high shortage cost affects PT XYZ's inventory costs. High stockout costs cause high total inventory costs, namely Rp. 245,925,269,841.01.

The main problems in this research include suboptimal inventory policies and no demand forecasting method. This research designs optimal inventory policies for non-food products with the aim of minimizing total inventory costs. Where later this research can be useful for companies as consideration in implementing warehouse inventory control system policies in order to minimize total inventory costs.

The method used to overcome the problems that occurred in this research was a periodic review (R,S) inventory policy with a Markov multivariate demand forecasting model approach. The data processing process in this research began with a data distribution test using Kolmogorov Smirnov. Demand forecasting is carried out using a multivariate Markov demand forecasting model. And designing inventory policies using the periodic review method (R, S).

The results show a reduction in total inventory costs of 46% or 131,601,820,076.03 from actual inventory costs. Sensitivity analysis was carried out on the results of inventory policy calculations using the periodic review (R,S) method with a multivariate Markov demand forecasting model approach, with increase and decrease values of 5%, 10%, 15%, 20% and 25%. Sensitivity analysis shows that changes in purchase costs have a significant impact on the optimal solution, while order, hold, and shortage costs show lower sensitivity.

In conclusion, this study did not determine the time interval (T) between each review. In several periodic review models, time intervals are considered fixed and are integrated into the company's operational system, so they do not need to be specifically mentioned in the model being developed. The main focus of this research is optimizing order quantity, reorder point, and safety stock in order to minimize company inventory costs. Lead time is used to estimate how much stock will run out before new orders arrive and the safety stock (SS) calculation in this research is to overcome fluctuations in demand during the review period. This inventory policy is able to reduce the total actual inventory costs by 46% and reduce the total inventory costs by IDR 114,232,449,764.98 so that the optimal proposed cost obtained is IDR 131,601,820,076.03.