ABSTRACT

The rapid development of digital technology and the increasing trend of online shopping have affected various industries, including the perfume industry. Online stores are now the main channel for selling perfume products, providing easy access and convenience for consumers. However, in their operations, online perfume stores face challenges in maintaining product availability, especially in predicting fluctuating demand. One of the main challenges faced by Julis, a subsidiary of PT. Cipta Essential Pasific, is the inability of the forecasting system used to handle changes in demand accurately, so that demand often cannot be met on time.

Julis has been using a qualitative forecasting method, which relies on intuition and analysis of previous period demand. This method has proven to be less effective in dealing with demand dynamics that cannot be predicted simply. Based on previous research (Pujarani, 2024), perfume products sold by Julis have been grouped into categories based on priority levels and contributions to company profits. In this case, product G1 (Group 1) is the main focus because it makes the largest contribution to the company's profits. However, G1 products face difficulties in meeting demand on time, resulting in a forecast-demand gap of 25.3% for 30ml Vanilla Cake products, 24% for 50ml Vanilla Cake products, and 24.8% for 100ml Vanilla Cake products.

This study aims to evaluate and propose a more accurate demand forecasting model to minimize the forecast-demand gap for Julis perfume products. One of the proposed approaches is the use of an Artificial Neural Network (ANN)-based forecasting method, which can capture the complex relationships between various factors that affect demand, such as product price, discounts, ratings, and seasonal factors (big days). This approach was chosen because of its ability to process non-linear data and take into account variables that were previously not used in traditional forecasting.

In this study, the ANN model was evaluated using forecast error evaluation metrics, such as Mean Absolute Deviation (MAD), Mean Square Error (MSE), and Mean Absolute Percentage Error (MAPE). The results of the analysis show that the ANN model is able to reduce the forecast error value compared to the existing

forecasting method using a qualitative approach. For the products 30ml Vanilla Cake, 50ml Vanilla Cake, and 100ml Vanilla Cake, forecasting using the ANN model successfully reduced the MAPE value from 25,3%, 24%, and 24,8% to 24,4%, 22,8%, and 22,8%, respectively. This shows a significant increase in forecast accuracy.

By integrating factors such as price, discounts, ratings, and special days into the forecasting model, companies can optimize demand fulfillment and plan production and marketing more effectively. This reduction in forecasting gaps not only increases operational efficiency but also helps companies respond to market changes more quickly and accurately. The results of this study provide an important contribution to companies in improving forecasting and operational strategies, and have the potential to increase Julis' competitiveness in the increasingly competitive online perfume market.

Keywords – [Forecasting, Artificial Neural Network, E-Commerce, Perfume]