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This study aims to design a demand forecasting model for pants using the Artificial Neural Network (ANN) method to minimize forecasting errors at PT XYZ. Currently, PT XYZ is experiencing issues with demand forecasting, resulting in overproduction of 20.43%. The main products at PT XYZ are jeans and cotton pants. This study concludes that the OXN brand pants account for 67.19% of the total product demand in 2023. However, inaccurate forecasting has led to an error rate of 22%, negatively impacting the company's operational efficiency. This research applies the Artificial Neural Network (ANN) method to address these issues. The ANN method was chosen due to its ability to handle complex and nonlinear data patterns. ANN simulates the way biological neural networks learn historical patterns to produce more accurate predictions. The ANN model used in this study has a multi-layer perceptron (MLP) architecture with three layers: input, hidden, and output. The model was trained using historical demand data from January 2022 to December 2023 and considers external variables such as product prices, special days (e.g., Idul Fitri and Idul Adha), and the male population in four main distribution provinces. The research process began with data collection from PT XYZ and the Central Statistics Agency (BPS). The collected data includes historical demand data, product prices, and other external variables such as population and special days. After data collection, normalization was performed to prepare the data for use in the ANN model. The model was then trained using 80% of the data for training and 20% for testing the model's performance. The model's performance was evaluated using various forecasting error metrics, including mean absolute error (MAE), mean squared error (MSE), and mean absolute percentage error (MAPE), to assess the accuracy of the ANN predictions. The results show that the ANN model significantly reduced forecasting errors at PT XYZ. Before implementing the ANN, the forecasting error for the OXN product was 22%. After applying the ANN, the forecasting error was reduced to 8%, representing a 14% improvement. Additionally, the Mean Squared Error (MSE) decreased from 1,021,013 to 643,238, indicating improved forecasting accuracy. These results demonstrate that the ANN method can produce

predictions closer to actual values compared to the previous forecasting methods used by PT XYZ. The application of the ANN method can help PT XYZ manage inventory more efficiently, reduce the risk of overproduction, and enhance production planning accuracy. With a more accurate forecasting system, the company can optimize its production and distribution processes, reduce unnecessary workload, and minimize potential losses due to excess stock. Furthermore, the ANN model can be extended to other products produced by PT XYZ, providing broader benefits for the company.

Keywords: **Demand Forecasting, Artificial Neural Network (ANN), Garment Industry, PT XYZ, Overproduction.**