

CHAPTER V

CLOSING

This chapter presents the conclusions and recommendations based on the research results concerning the application of the Hybrid ARIMA–XGBoost model, the use of forecasting results for inventory policy calculations, and the presentation of the results on a dashboard.

5.1 Conclusions

Based on the research results, several main conclusions were obtained as follows:

1. The study successfully applied the Hybrid ARIMA–XGBoost model to predict weekly sales of eyeglass frame products. Daily transaction data were processed into weekly data so that the sales patterns were more stable and suitable for the forecasting process. ARIMA was used to capture linear patterns, while XGBoost was used to capture nonlinear patterns from historical features.
2. Model testing showed that Hybrid ARIMA–XGBoost provided the best performance compared with ARIMA and XGBoost. This model produced an MAE of 1.716391, an RMSE of 2.296153, and a MAPE of 9.987842 and was therefore selected as the best model.
3. The forecasting results from the best model were used as the basis for inventory policy calculations, including forecast distribution to SKUs, safety stock, ROP, restock status, recommended restock quantity, and restock priority. These calculations considered the service level based on product price categories and lead time as the basis for determining inventory requirements. Through proportional distribution based on historical sales, these results could be used as the basis for more targeted inventory decision-making.
4. The developed dashboard displayed a summary of the total number of SKUs, the MAPE of the best model, the number of SKUs requiring restocking, actual and forecast graphs, evaluation metrics, restock visualisations, and a

detailed recommendation table. The dashboard helped present information concisely, systematically, and in an easily understandable manner.

5.2 Future Recommendation

Based on the findings of this study, several recommendations are proposed for future research and system development:

1. Future studies should expand the dataset by incorporating a longer observation period and more recent data to improve the model's ability to identify changes and trends in sales patterns.
2. Additional variables that may influence sales, such as holidays, seasonal patterns, promotions, product trends, and other external factors, should be included to enable the model to capture demand patterns more accurately.
3. The Hybrid ARIMA–XGBoost model should be compared with other forecasting approaches based on statistical methods, machine learning, and deep learning to identify the method that produces the lowest prediction error.
4. Future inventory policy calculations should consider holding costs, ordering costs, and stockout costs so that the resulting restock recommendations are more efficient and economically relevant.
5. The dashboard should be further developed by incorporating automatic data updates, database integration, category-based filters, and report export features to facilitate inventory monitoring and reporting.
6. The dashboard should be evaluated by Grand Optic users to assess its ease of use, clarity of information, and usefulness of the restock recommendations in supporting inventory decision-making.