Application of Machine Learning Demand Forecasting Techniques in the Italian Processed Meat Industry

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Abstract

Demand forecasting is a crucial component of supply chain management for many industries, especially in the case of perishable goods. This work investigates the effectiveness of different machine learning methods for daily demand forecasting, specifically in the context of an Italian company that operates in the processed meat industry.

We present different forecasting models, each designed to serve as a tool to support decision making, inventory management, and production planning. Our aim is to produce a forecast as accurate as possible, which will subsequently serve as a basis for implementing a good-quality production schedule.

We extend our previous work [1] by proposing several forecasting models and different training procedures. In particular, we include an original training procedure that extends the demand categorization by [2] and that, in our case study, is able to outperform classic approaches of the forecasting literature.

Additionally, we include an inventory simulation based on the company data set to illustrate the practical implications of using our forecasting methods on the company's inventory management. The simulation analysis shows that our best method can lead to significant improvements in inventory management, by reducing waste and increasing efficiency.

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References: [1] Mucciarini, M., Caselli, G., Iori, M., and Lippi, M. Demand Forecasting Methods: A Case Study in the Italian Processed Meat Industry [Conference Presentation Abstract]. ECCO XXXV - CO 2022 Joint Conference. https://ecco2022.euro-online.org/abstract_book.pdf

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