McBride Ltd is Europe’s leading producer of private label Household and Personal care products. It operates in the FMCG sector with more than 500 customers and approximately 5000 products. In order to manage this production volume, McBride uses a hierarchical forecasting system. This project evaluates the forecasting demand system used by the client and provides suggestions for improved forecasting accuracy. Additionally an ABC/XYZ classification was applied to achieve better inventory management and an improved forecasting strategy.

Challenge Overview

The current forecasting process of McBride does not incorporate all information sources, e.g. statistical forecasts do not consider promotions, and therefore manual adjustments are needed. Moreover, some of the available models in the SAP system do not work and, therefore, are not in use or produce implausible forecasts that need manual adjustment. This project’s objective is to measure the accuracy achieved when using the existing demand forecasting system and then use it as a benchmark while exploring and experimenting with all the options available to McBride and evaluating the different models and model selection procedures. In addition, the effectiveness of the existing segmentation system in the company has been measured and compared with that of other potential systems that provide potentially higher effectiveness for McBride.

Solving the Problem

The project analyses, on the one hand, the current forecasting process of McBride and the models that are available through the SAP-APO system. The primary goal here was to obtain improved model settings. Moreover, the products were segmented according an ABC and XYZ analysis that serves as a decision instrument for management. Additional potential models were also evaluated both for continuous and intermittent time series. In order to perform the evaluation forecasting models of the SAP-APO system have been implemented into R where the forecast accuracy was measured on hold-out samples.

Results and Achievements

The results showed that only few products are seasonal, and almost none of them experience trend. The analysis has clearly shown that products with either continuous or intermittent demand should be analysed separately. The recommended threshold for detecting intermittent demand should be set 30% of zeros in the historical values, a change from current practice. For those products Croston’s method has been found to deliver superior forecasting results. For existing models in the SAP-APO environment, small settings can lead to increased accuracy and proved to provide good forecasts. It is important to deactivate the automatic outlier correction as they might take away important patterns in the data that need to be found when choosing the forecasting model. This is in particular true for outlier correction with the Median Method which resulted in unsuitable forecasts. However, outside the SAP-APO environment, the Multiple Aggregation Prediction Algorithm (MAPA) proved to be the most accurate.