

Analyzing Sales Cannibalization Through Utility Theory to Improve Accuracy of Predicting POS

Allow us to quantify how the product attributes affect the probability of a certain purchase by a consumer

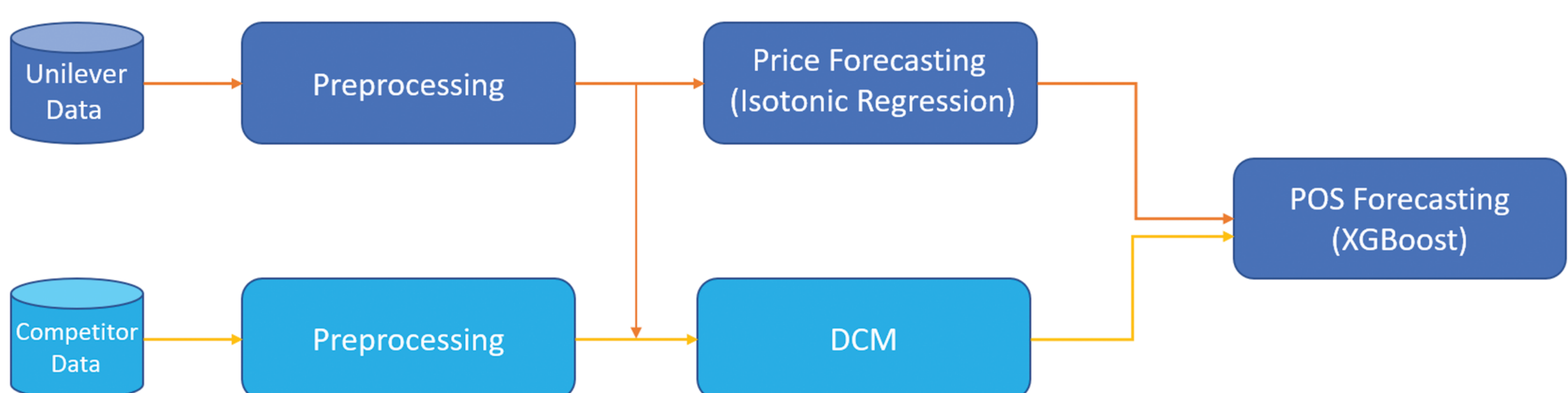
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PROJECT SUMMARY

Unilever D&A's trade promotion optimization (TPO) consists of two parts: point of sale (POS) forecasting and promotion strategy optimization. POS forecaster models the consumer POS from in-person retailers and generates the forecast of demand. The predicted results will then be used for the optimization part. The POS forecaster first uses previous sales data to predict the product's future price through isotonic regression to predict. Then it uses the predicted future price and other sale-related data to predict future points of sale through random forest XGBoost.

This project focuses on adding a cannibalization model to POS forecaster. This part will input sales data and product attributes information data from both Unilever and competitors into DCM. DCM will calculate the utility value(coefficient) for each attribute according to consumer features and product features. The result will be a set of coefficients for each attribute, which means the value of product attributes. Then we can incorporate cannibalization results with previous forecaster as new features and help to improve the performance. The values of coefficients can also provide business insight into how important each product attribute is.

