Predict Product Backorder in Supply Chain Management

By Kartik Dube

BUSINESS PROBLEM

Back orders in supply chain are defined as ordered by customers in the form of products or services which the company isn't able to fulfill due to lack of availability. In short when the demand is very high and the supply is not available. Due to high competition and high requirements back orders might affect the relationship between the company and the customers. Also, A company cannot keep their products in an inventory because this process is expensive. Due to this reason all the companies in the Supply Chain industry want to predict whether their service or product will face backorders or not. The question here is, "Given the sales, transit and forecast data about a product, can we predict whether a product will face backorders?"

DATA COLLECTION AND DESCRIPTION

The data was collected from Data.World[1] as a CSV file. The dataset contains the historical data for some weeks prior to the week we are trying to predict. In this dataset we'll use the feature "went_on_backorder" for our prediction. The dataset gives a lot of information like inventory storage, sales and forecast, potential issues and many more, we'll use these features to make our predictions. The dataset has 1687861 rows and 23 columns. The features of the dataset are as follows:

- Sku : Random ID for the product
- national_inv : Current inventory level for the part
- lead_time : Transit time for product (if available)
- in_transit_qty : Amount of product in transit from source
- forecast_3_month : Forecast sales for the next 3 months
- forecast_6_month : Forecast sales for the next 6 months
- forecast_9_month : Forecast sales for the next 9 months
- sales_1_month : Sales quantity for the prior 1 month time period
- Sales_3_month : Sales quantity for the prior 3 month time period
- sales_6_month : Sales quantity for the prior 6 month time period
- Sales_9_month : Sales quantity for the prior 9 month time period

- min_bank : Minimum recommended amount to stock
- potential_issue : Source issue for part identified
- pieces_past_due : Parts overdue from source
- perf_6_month_avg : Source performance for prior 6 month period
- perf_12_month_avg : Source performance for prior 12 month period
- local_bo_qty : Amount of stock orders overdue
- deck_risk : Part risk flag
- oe_constraint : Part risk flag
- ppap_risk : Part risk flag
- stop_auto_buy : Part risk flag
- rev_stop : Part risk flag
- went_on_backorder : Product actually went on backorder

REFERENCES

1. https://data.world/josephf/can-you-predict-product-back-order