



Project - PACCAR Parts

PREPARED BY:

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Primary Objective

PACCAR is looking to create a model to help them minimize future stockouts by automatically making order suggestions.



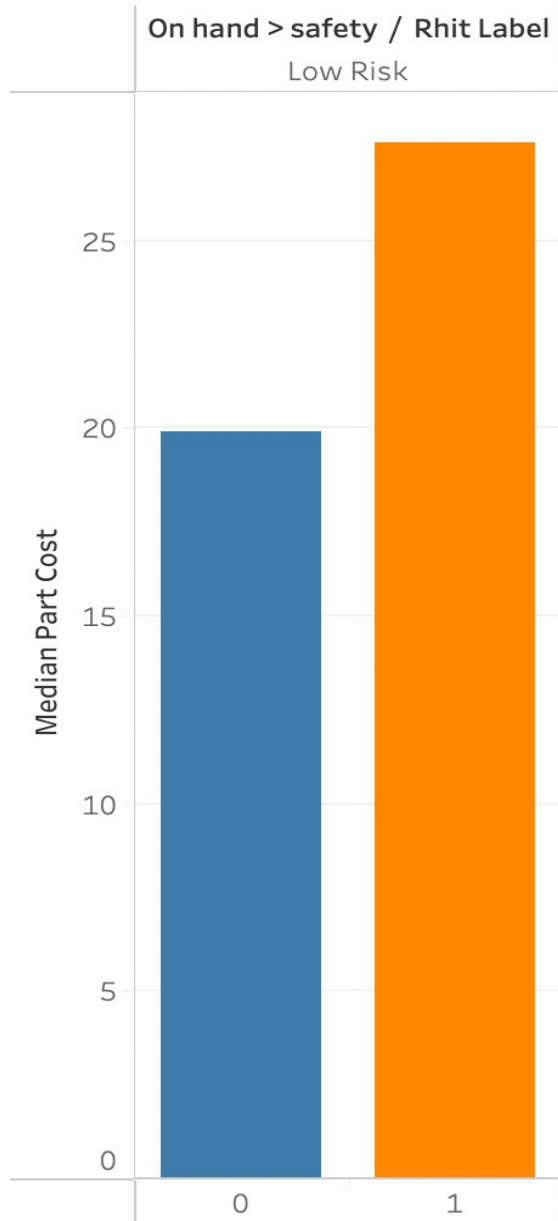
We are looking to put a model that can be compared to the in-production model and see whether the results have improved or not.

Accuracy = 80%

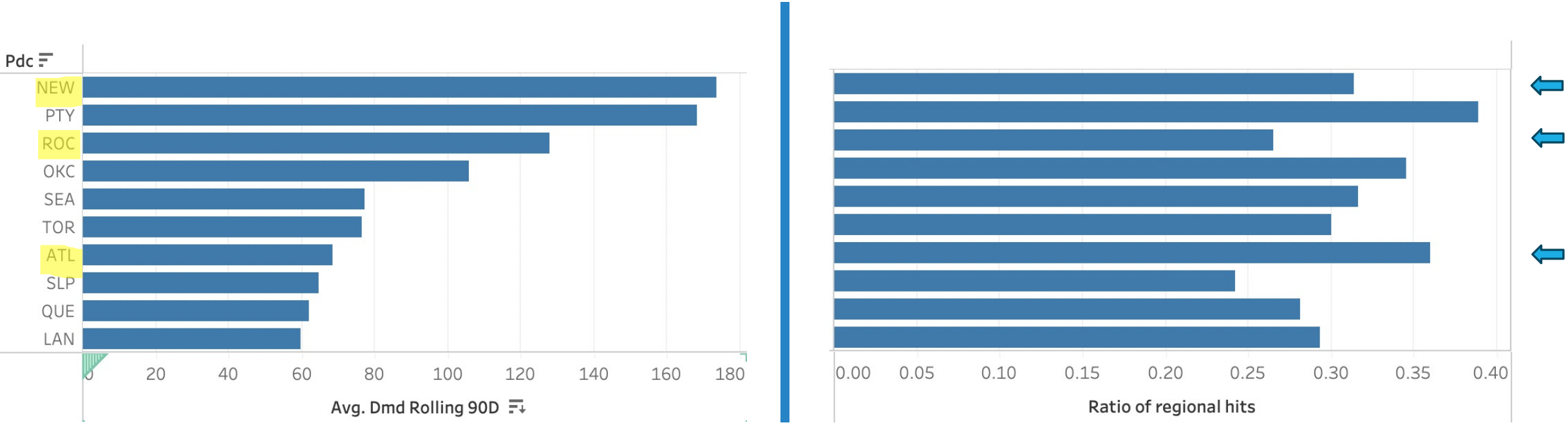
Precision = 75%

Data Insights

Manage the high price items better during low-risk scenarios



PDCs Average Demand vs. Ratio of Regional Hits

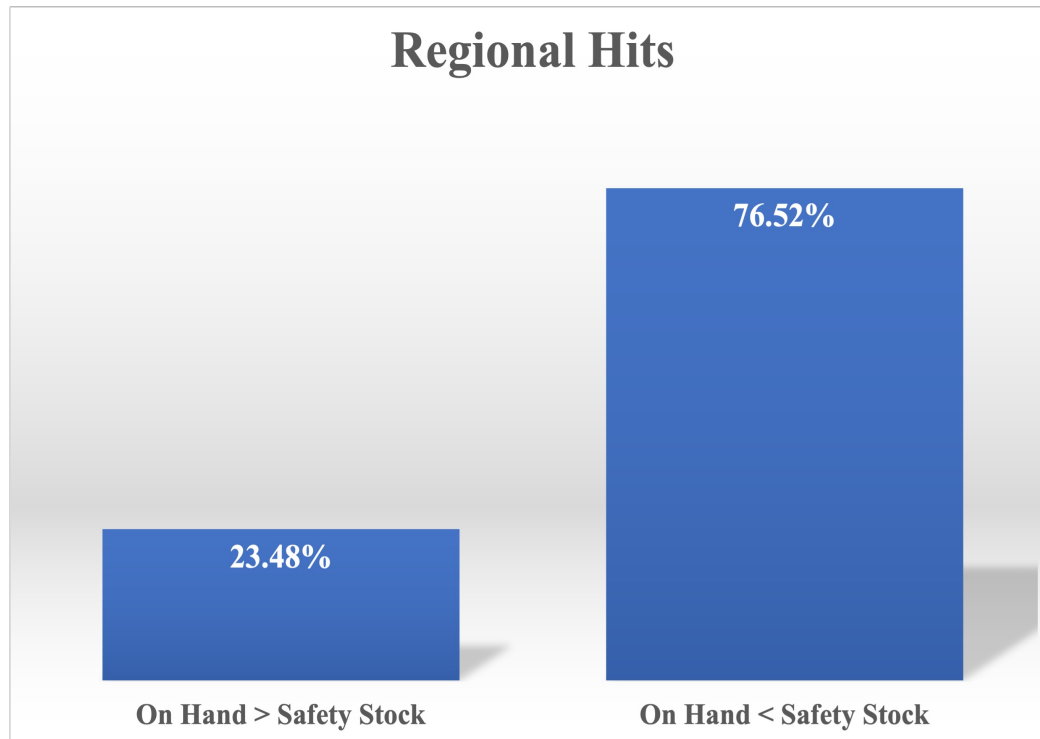


Optimize PDCs with low demand and high Regional hits ratio

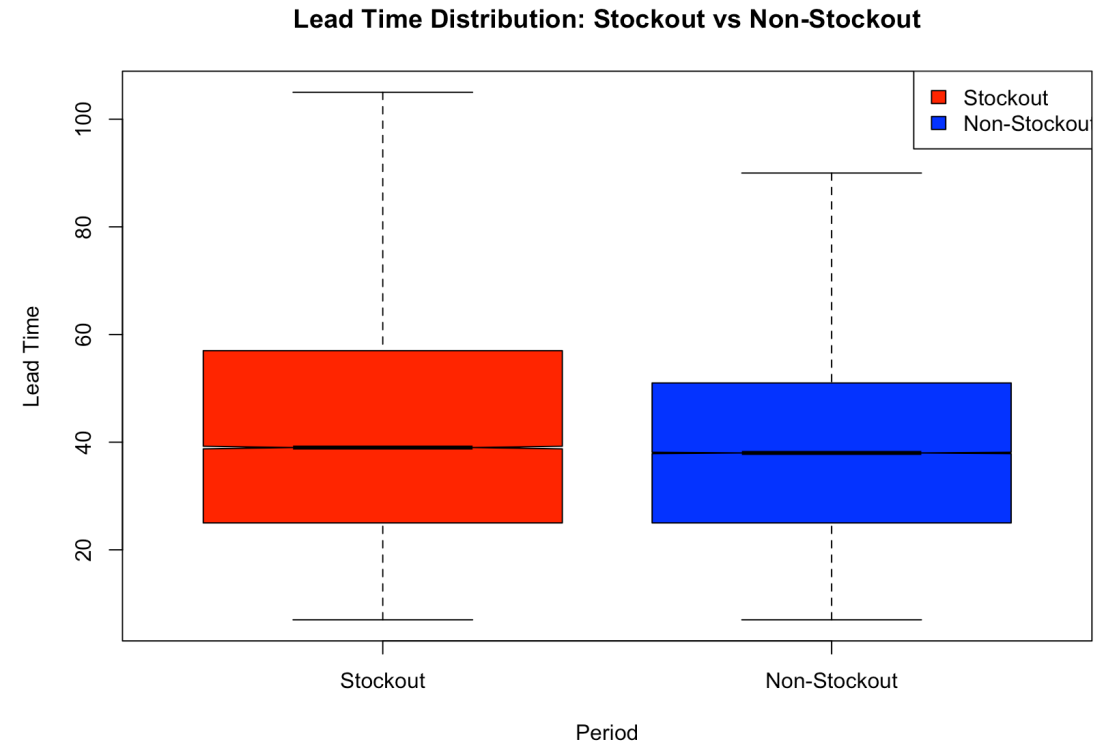
PDC stands for PACCAR Distribution Center

About One-fourth of regional hits still occurred despite having On Hand inventory higher than Safety stock

ROLE OF SAFETY STOCK IN REGIONAL HITS



ROLE OF LEAD TIME IN REGIONAL HITS

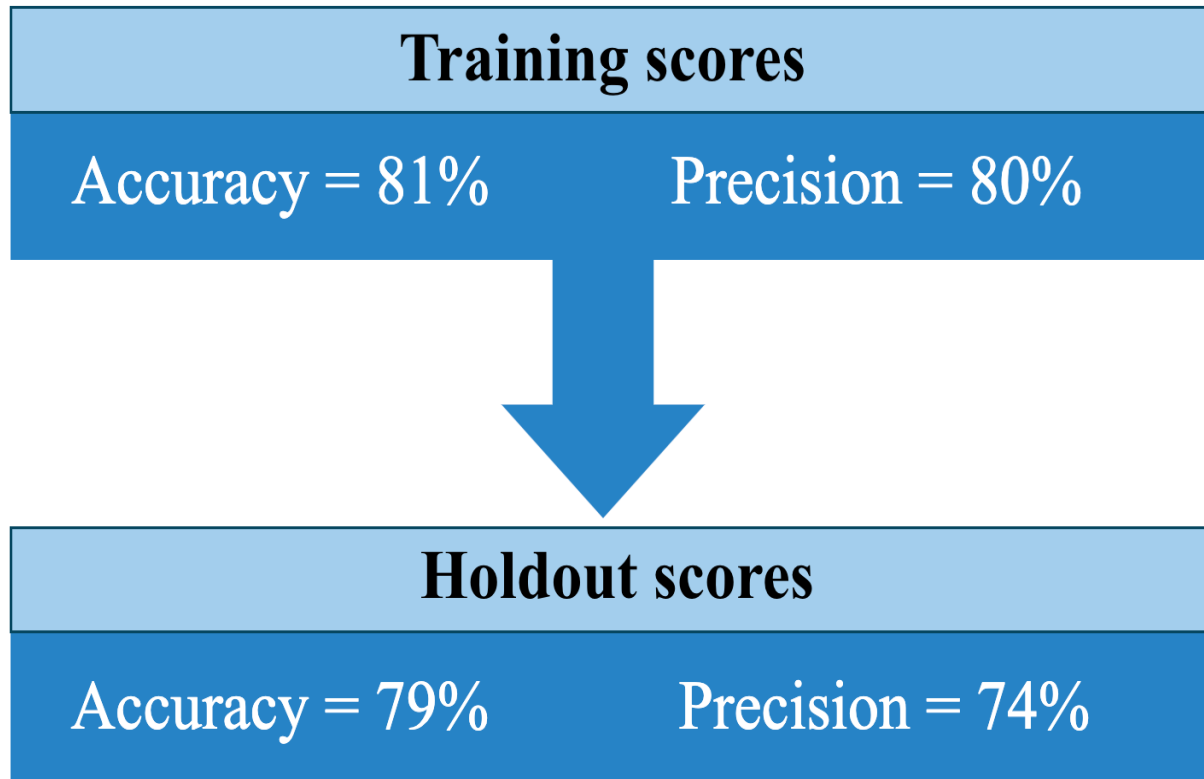


Model

Method: Random Forest Model.

- Handling missing values in the dataset - filled in with mean & median values using other relevant features.
- Feature Selection: Principal Component Analysis to identify critical data factors and patterns.
- K-fold cross-validation technique for generalization and better performance.
- Important variables: On-Hand Inventory, Safety Stock left percent, Max On hand left percent, days on hand, days on hand to lead time, Demand Rolling 90 days, Lead Time, Expected quantity to be sold, Part Cost, Velocity.

Results



- Our model holdout scores were comparable to the scores of the model in production, with an Accuracy of 79% and Precision of 74%.
- The variation in our model results could be due to the presence of new categorical information in hold-out data, which might have influenced the model's performance.

Model Limitations

- Limited timeframe data and seasonality effects
- Limited features, ex. Inside Leads only

Recommendations

- Keep the PACCAR in-production model, while we further evaluate our model.
- More robust time series data can help evaluate demand seasonality and improve overall model performance.