



Maverik Store Forecasting Model

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Presentation Overview

- Business Problem
- Modeling Approach
- Recommend Model & Results
- Future Analysis
- Business Value



Business Problem



Modeling

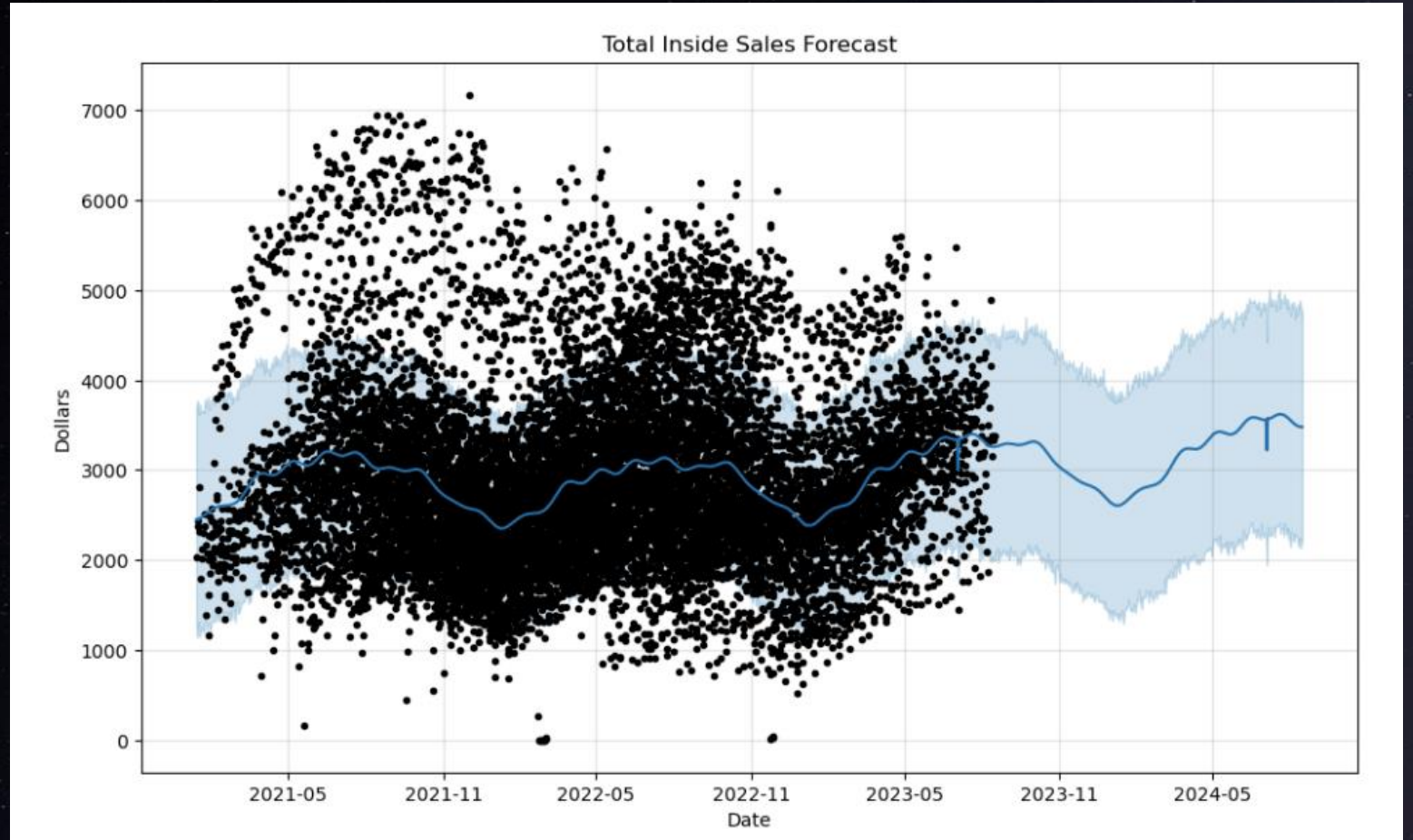
Eight models were tested

- Simple Average
- Linear Regression
- SARIMA
- ARIMA
- Exponential Smoothing
- XGBoost
- Neural Network (LSTM)
- Prophet



Why the Prophet Model?

- Trains on 2.5 years' worth of data
- Predicts 365 days into the future
- Captures daily, monthly, yearly, and holiday seasonality



Model Performance Metrics

- MAE ((Mean Absolute Error)
- RMSE (Root Mean Squared Error)
- MAPE (Mean Absolute Percentage Error)
- RMSPE (Root Mean Square Percentage Error)
- RAE (Relative Absolute Error)
- RRSE (Root Relative Squared Error)
- MASE (Mean Absolute Scaled Error)



Model Performance Metrics

Using cross validation, the Prophet model produced the following results:

Inside Sales

- 2 week predicted RMSE - 997
- 3 week predicted RMSE - 979
- 6 month predicted RMSE - 930

Food Service

- 2 week predicted RMSE - 362
- 3 week predicted RMSE - 339
- 6 month predicted RMSE - 333

Diesel

- 2 week predicted RMSE - 2,534
- 3 week predicted RMSE - 2,131
- 6 month predicted RMSE - 2,199

Unleaded

- 2 week predicted RMSE - 935
- 3 week predicted RMSE - 1,018
- 6 month predicted RMSE - 1,040



Model Performance Metrics

MAPE(errors as a percentage) - as close to 12% from actuals when testing for individual stores

MASE(compares error performance against a basic Naïve model) -

- Cross validation: up to 26% improvement
- Testing for individual stores: up to 17% improvement



Analytic Results of Model

Overall -

- Significant improvement to current Maverik Model
- Lower error rate
- Up to 26% increase in accuracy for predicting sales vales

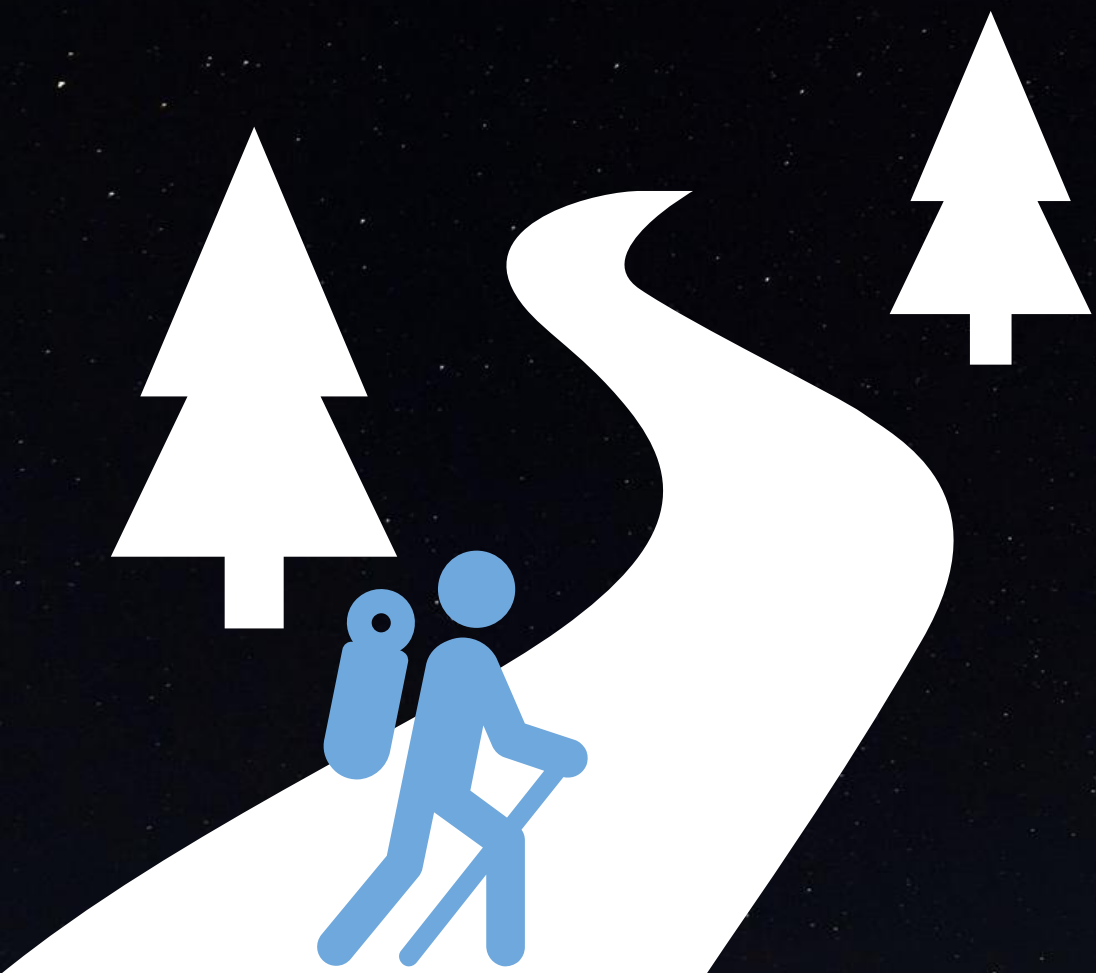
Weaknesses -

- Performance decreases for stores with extremely high or low target values



Future Recommendations





Macroeconomic Effects

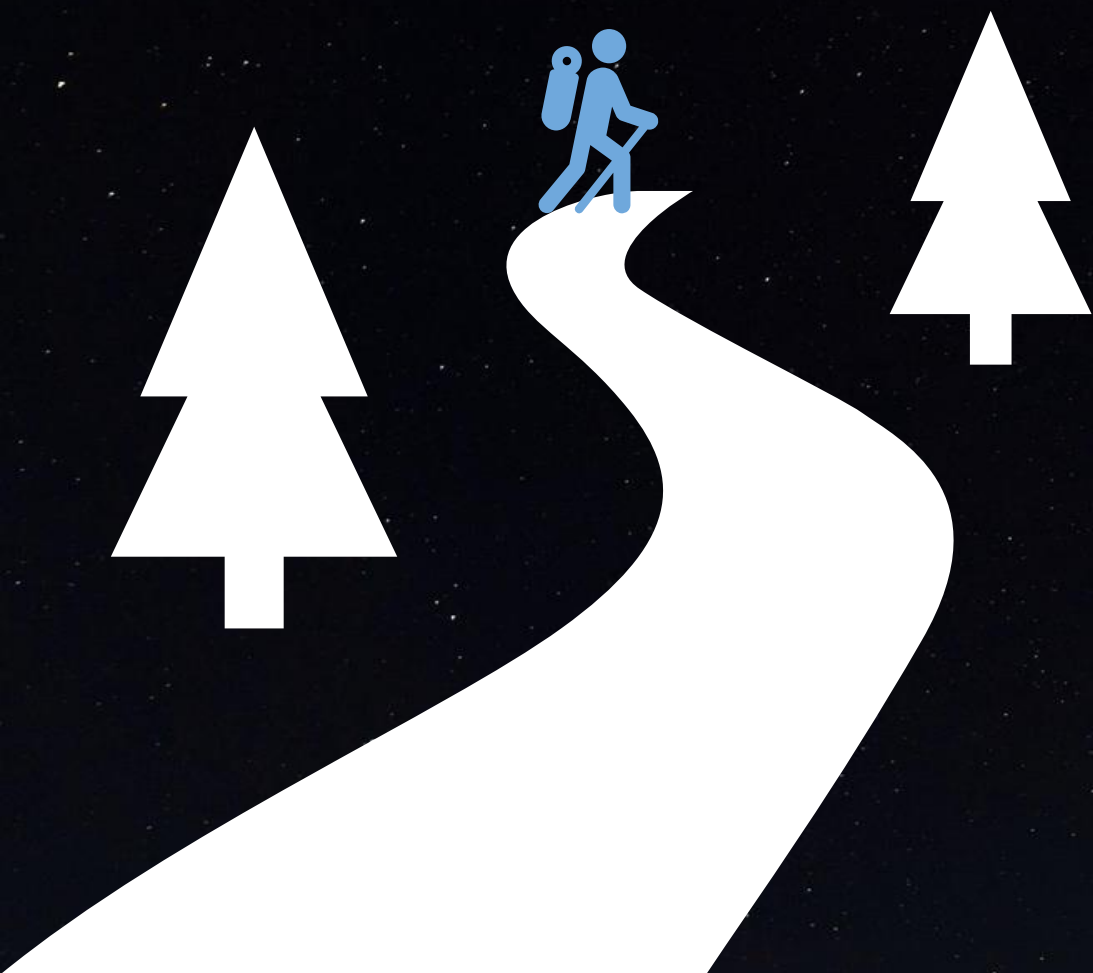




Store Locations

Macroeconomic Effects





Integrate Model with
Current Technology

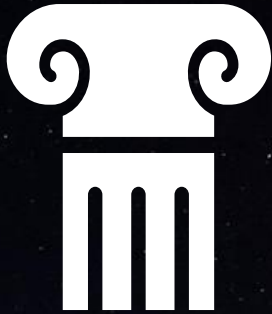
Store Locations

Macroeconomic Effects



Business Value of this Model

Marketing



Finance



Operations



Management



Marketing: Learn where and
how sales could increase





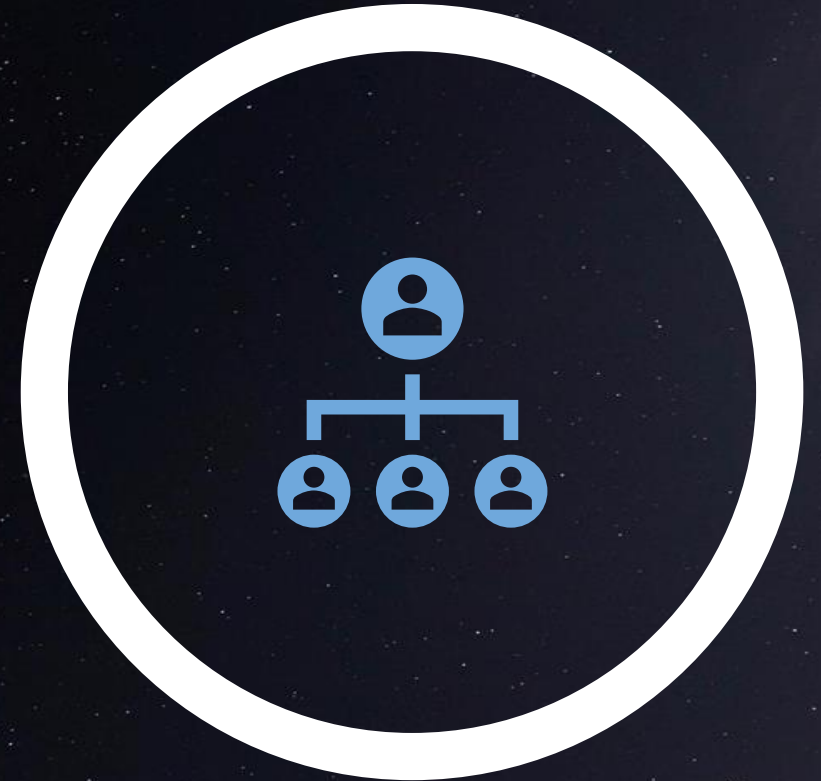
Finance: See which stores have the highest revenue growth opportunity



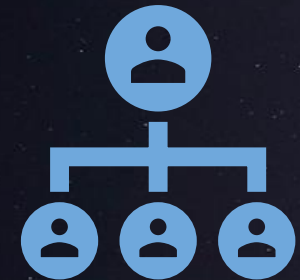
Operations: Anticipate the supply needed to match the demand for each store



Management: Anticipate earnings of Maverik stores to inform shareholders of growth to the Maverik brand



Business Value of this Model



Fuel to Maverik's Big Adventure

MAVERIK

