

Quarterly Business Review - Shipping Performance



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Presentation Structure

01
**Problem
Statement**



02
**Supply Chain
Overview**



03
**Data
Overview**



04
EDA



05
**Model
Evaluation**



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Conclusion



Problem Statement

Can we accurately predict at the time a customer places an order, whether our warehouse will ship it on time?

Supply Chain Overview



**Customer
Orders**



**Item
Picked**



**Item
Packed**



**Item
Shipped**



**Item
Delivered**

Supply Chain Overview



**Customer
Orders**



**Item
Picked**



**Item
Packed**



**Item
Shipped**



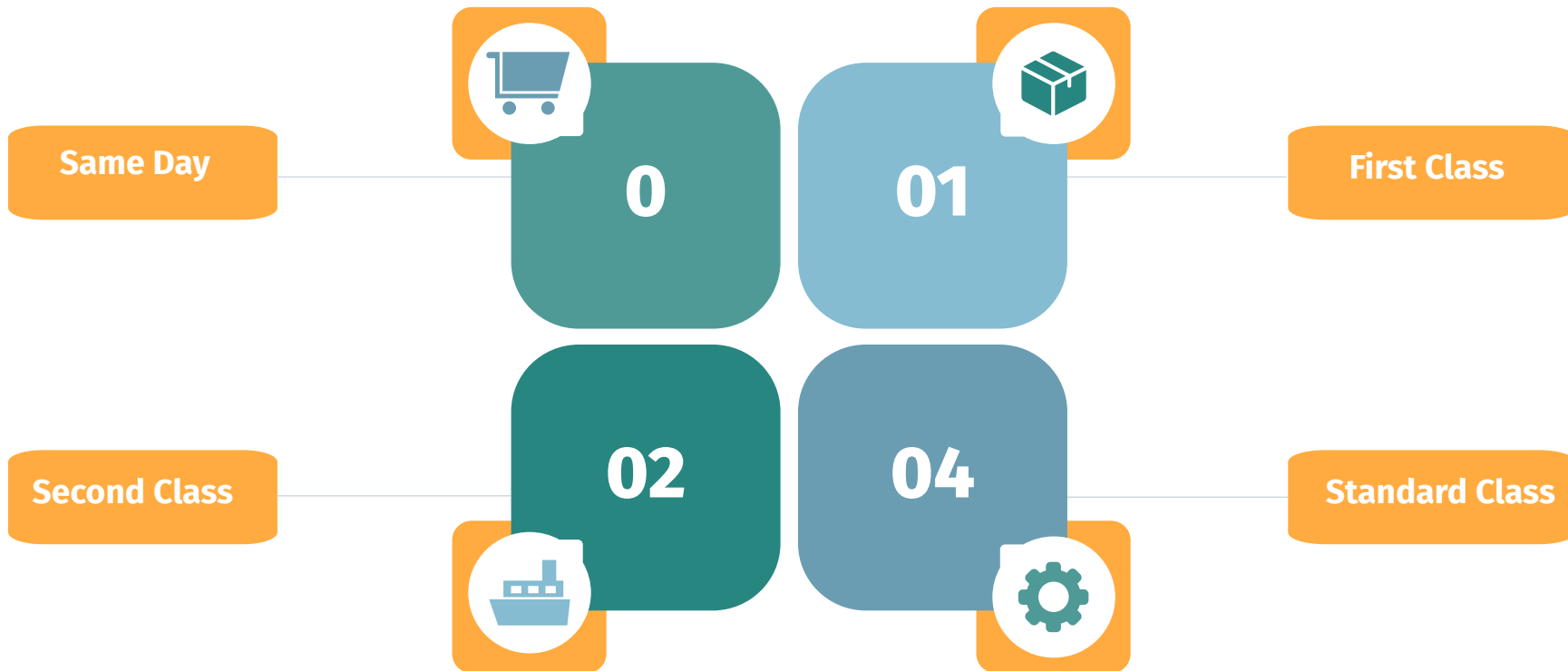
**Item
Delivered**

42%





Shipping Options



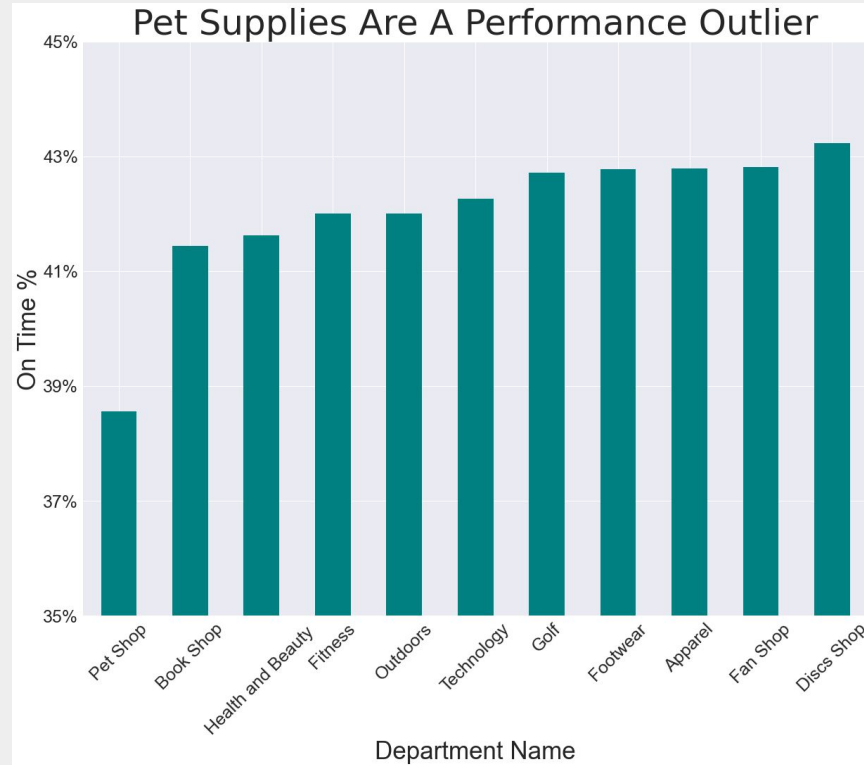
The Data

- Kaggle dataset
- 180,000 orders
- 60 different columns
 - Product
 - Customer
 - Order
- Jan 2015 - Jan 2018



<https://blog.bizvibe.com/wp-content/uploads/2020/04/largest-logistics-companies.jpg>

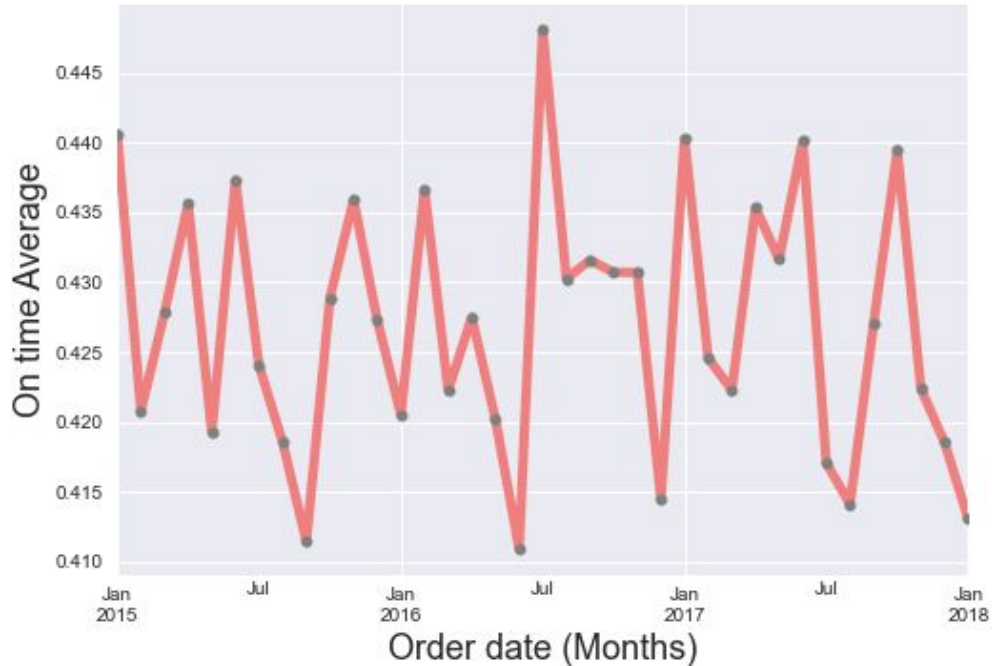
Performance By Department



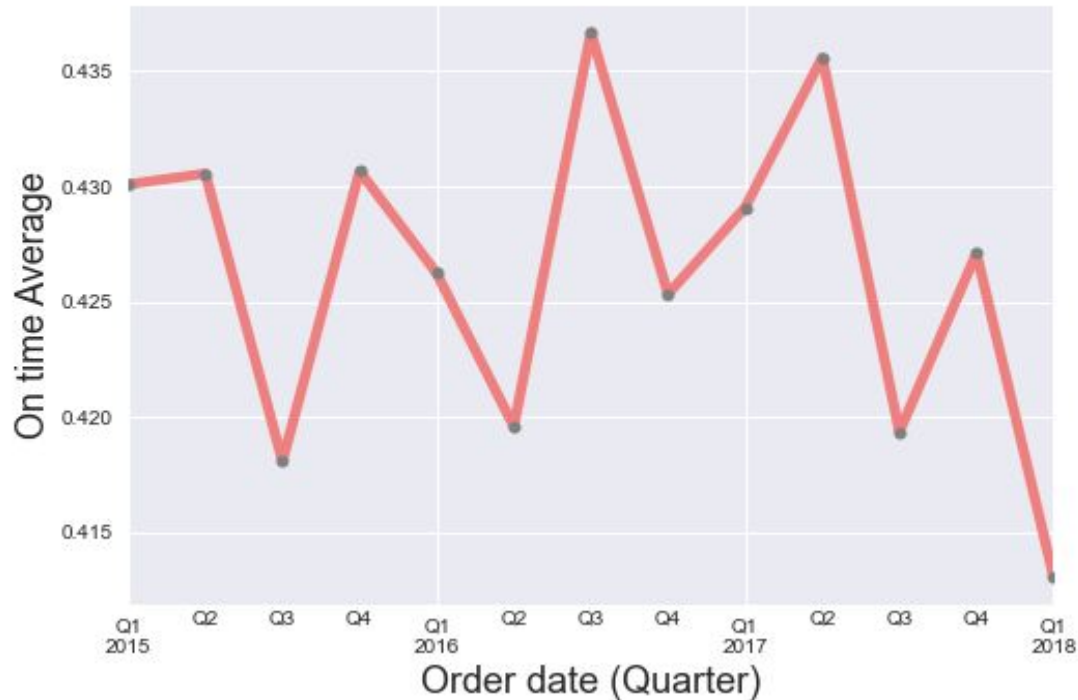
Regional Performance



Performance Over Time



Seasonal Performance



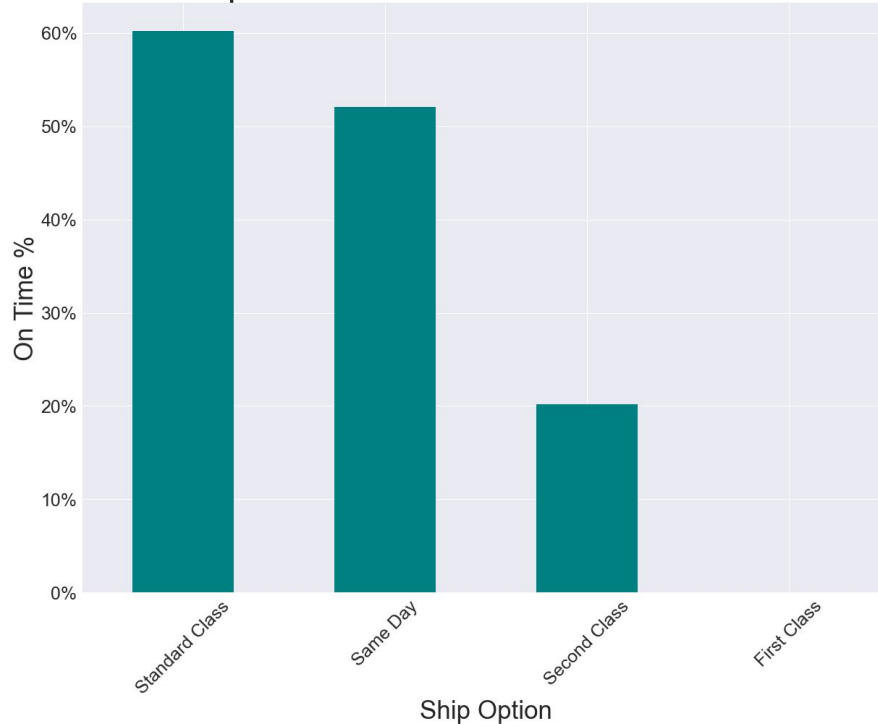
Hourly Performance

Performance Decreases For Orders Placed After Noon

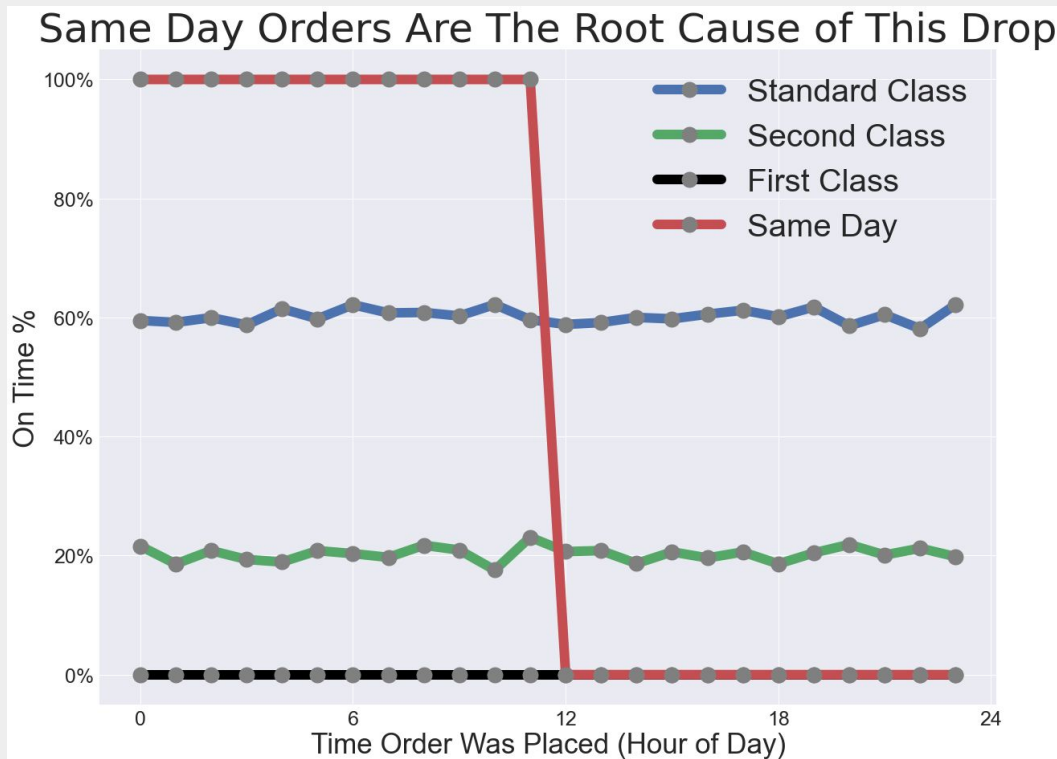


Performance By Ship Option

First Class Shipments Have a Zero Percent Success Rate



Hourly Performance By Ship Mode



Best Model - Extra Tree Classifier

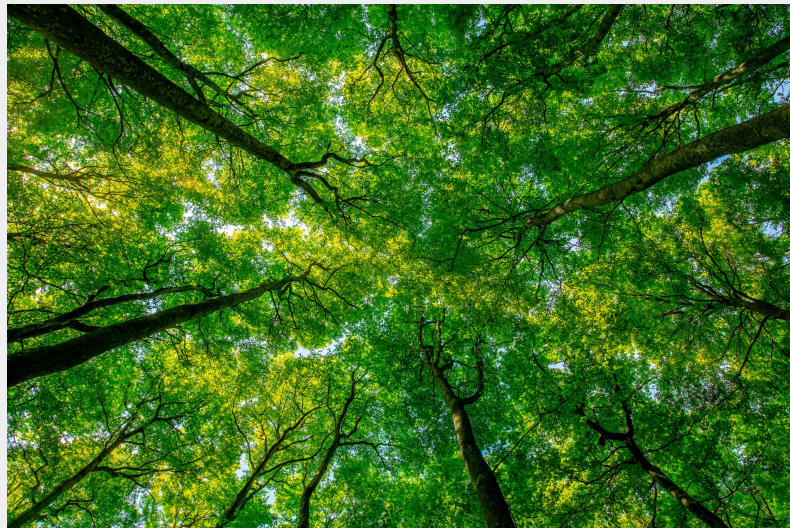
92.55% accuracy vs **57.27%** baseline

TTS, One Hot Encoded, Scaled

Performed much better than Logistic Regression(!!)

19 features

Engineered features: Order Month, Order Hour of Day, Order Day of Week, Ordered Before/After Noon



Best Model - Extra Tree Classifier

Top-performing Features:

- Shipping Mode
- Latitude and Longitude (customer)
- Order Hour of Day
- Order Before Noon
- Order Day of Week, Order Month
- Order Item Profit Ratio, Order Item Discount Rate

Interactive Portal



Recall Our Problem Statement

Can we accurately predict at the time a customer places an order whether our warehouse will ship it on time?

Yes. We can know with ~93% certainty whether a shipment is at risk of shipping late.

Recommendations

Don't offer Same Day delivery after midday

Reallocate freed resources from Same Day to First Class

Sites with lower ship volume struggle

Prioritize at-risk shipments

Thanks for Listening
Q & A