



PREDICTING FUTURE SALES

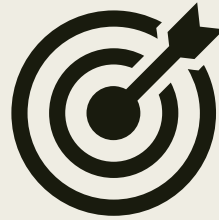
DEMYSTIFYING THE QUALITIES THAT DRIVE
BOOZE 'R' US'S LIQUOR SALES

Martin Hsu, Andrew Kerr, Erik Luu, Matteo Shafer, and
Isabella McCarty

INTRODUCTION



BOOZE 'R' US
RFP



ANALYSIS
OBJECTIVES



DATA
COMMUNICATION

PROJECT SCOPE

-DATA COLLECTION-

IOWA LIQUOR SALES API

- *CASE STUDY: CASEY'S GENERAL STORE, 2017-2020*
- *ESTIMATE SALES WITH STORE PURCHASES*

LIQUOR TYPE, SIZE, COST, TIME PERIOD

- *IDENTIFYING POSSIBLE SALES FACTORS*

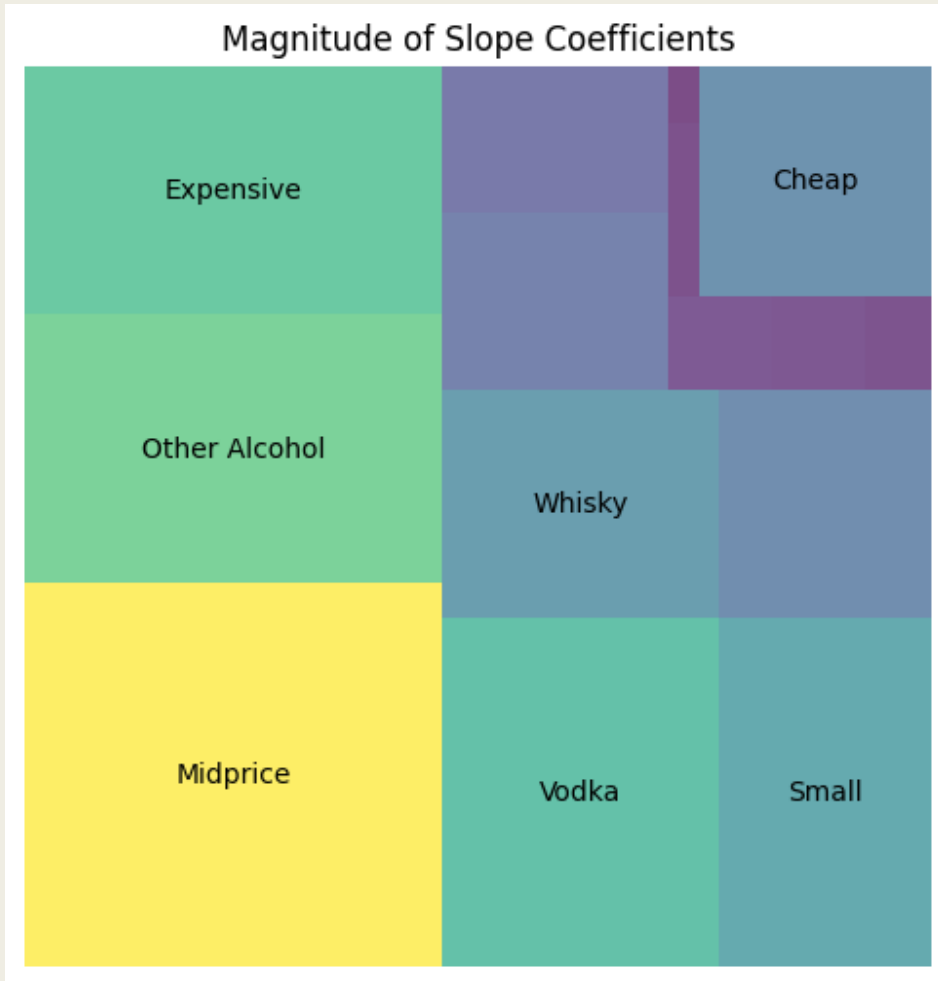
DATA AGGREGATION

- *STOREFRONT-MONTH LEVEL OBSERVATION*

MODEL RANKING	FEATURES IN MODEL
1	MONTH, BOTTLE SIZE, BOTTLE COST, LIQUOR TYPE
2	YEAR, BOTTLES SIZE, BOTTLE COST, LIQUOR TYPE
3	BOTTLE SIZE, BOTTLE COST, LIQUOR TYPE

PROJECT SCOPE -MODEL FITTING-

- MODEL CHOICE:
LINEAR REGRESSION
MODEL WITH PENALIZATION
TERM
- VARIOUS COMBINATIONS OF
FEATURES (PERIOD, SALE
VOLUME, SIZE, COST,
LIQUOR TYPE)
- RIGOROUS VALIDATION
PROCESS BY GENERATING
AND TESTING MANY
VERSIONS OF SAME
MODELS



KEY FINDINGS

DETAIL-ORIENTED, INFO-DENSE APPROACH

■ SEASONALITY - *MONTH*

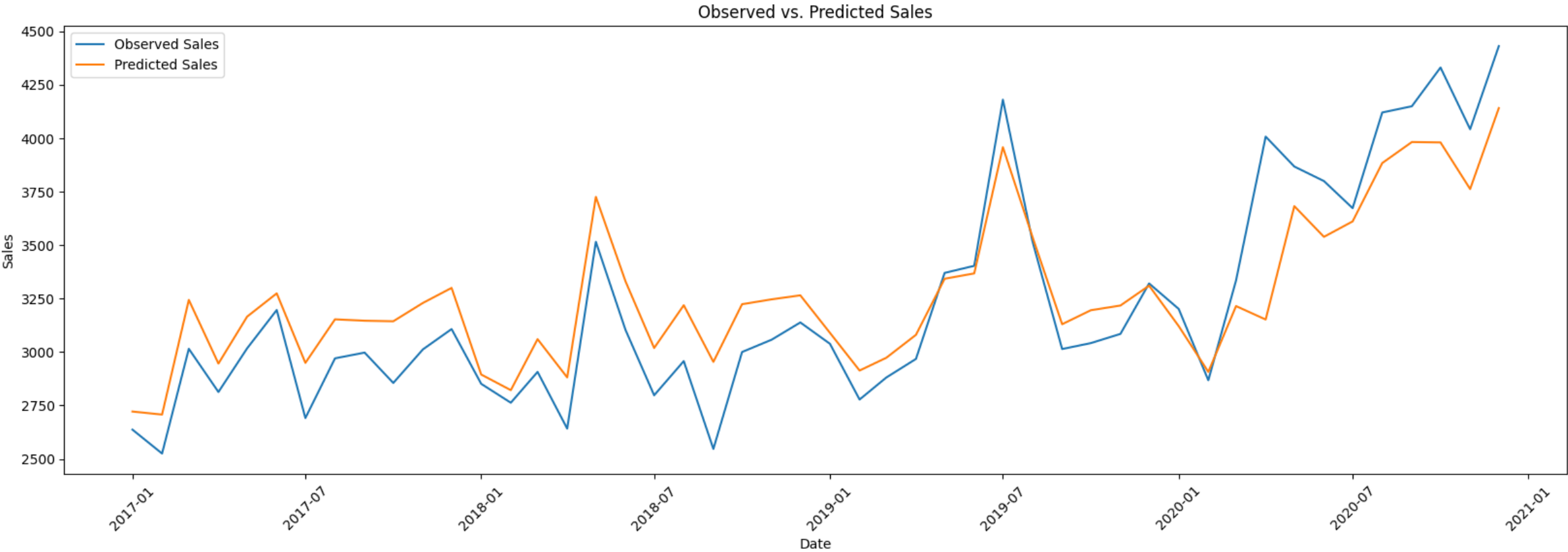
■ VALUE DRIVERS

- *MIDPRICE (\$25-\$50), EXPENSIVE (>\$50)*
- *SMALL BOTTLES (<750mL)*
- *VODKA, WHISKEY, OTHER*

■ GROWTH OBSTACLES

- *CHEAP LIQUOR (<\$25)*

COMPARISON: CASEY'S GENERAL STORE 2017-2020,
AVERAGE MONTHLY SALES PER STOREFRONT (PREDICTED VS. OBSERVED)



FINAL MODEL

ROBUST SALES PREDICTIONS, VALUABLE GROWTH INSIGHTS



UNVEILING INSIGHTS

ANALYZING FACTORS INFLUENCING ALCOHOL PURCHASES IN IOWA FOR DEAD

Martin Hsu, Andrew Kerr, Erik Luu, Matteo Shafer, and
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INTRODUCTION



D.E.A.D MISSION



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-DATA COLLECTION-

IOWA LIQUOR SALES API

- *RANDOM SAMPLING AND QUERIES*

HOLIDAYS AND IOWA COLLEGES

- *INTRODUCTION OF POSSIBLE
FACTORS*

FEATURE ENGINEERING

- *ANALYTICAL METHODS AND CUSTOM
FACTORS*

MODEL RANKING	FEATURES IN MODEL
1	LIQUOR CATEGORY, HOLIDAY, COST PER LITER, COLLEGE COUNT
2	LIQUOR CATEGORY, HOLIDAY, COST PER LITER, STUDENT POPULATION
3	LIQUOR CATEGORY, HOLIDAY, COST PER LITER, STUDENT POPULATION, DAY OF THE WEEK
4	LIQUOR CATEGORY, HOLIDAY, COLLEGE COUNT, DAY OF THE WEEK, MONTH, COUNTY, SIZE OF STUDENT POPULATION
5	LIQUOR CATEGORY, HOLIDAY, COLLEGE COUNT, DAY OF THE WEEK, MONTH, SIZE OF STUDENT POPULATION

PROJECT SCOPE -MODEL FITTING-

- MODEL CHOICE:
LINEAR REGRESSION
MODEL WITH PENALIZATION
TERM
- VARIOUS COMBINATIONS OF
FEATURES TESTED IN THIS
MODEL
- VALIDATION METRIC TO
MAKE INTER-MODEL
COMPARISONS

Magnitude of Slope Coefficients



KEY FINDINGS

- FEATURES THAT LEAD TO LARGER ALCOHOL PURCHASES
 - *VODKA, RUM, HOLIDAY*
- FEATURES THAT LEAD TO SMALLER ALCOHOL PURCHASES
 - *BRANDY, COST PER LITER*
- NOTABLE FEATURES
 - *SCHNAPPS, COLLEGE COUNT*



RECOMMENDATIONS

ACTIONABLE RECOMMENDATIONS TO PROMOTE SAFER ALCHOL
CULTURE IN IOWA