eBay Motors – The Next Step

Final Group Project Presentation

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Situation & Project Goals

Situation

1. eBay Motors wants to improve the traffic on their webpage and increase the rentention rate of buyer and seller of used cars.

2. In the last 5 years eBay lost almost 30 per cent of his market share in the used car classified website market.

3. Without innovation on their webpage eBay risk to lose their position as market leader to their biggest competitor craigslist which holds an competitive advantage.

Goals of eBay Motors "The Next Step Project"

1. Develop price predictive feature as the unique addon to the website. Maintain atleast 75% accuracy for the price prediction model.

2. Develop a formula that helps in understanding which are the most sold cars for the previous fiscal year.

3. Understand the most influencing factors and characteristics that makes the car more saleable in order to increase the seller rate and to therefore balance the market equilibrium.

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1. Situation & Project Goals

2. **Executive Summary**

3. Approach

4. Model Details

5. Key Points and Findings

6. Recommendations

Executive Summary

"Make Customer The Hero Of Your Story"
Increase revenues by increasing the web traffic!

Problems

- **Decline in revenues**
- ➢ The number of users defines the popularity of the web site, if the user count is less, the traffic is less making the website prone for low traffic.
- ➢ Less traffic yields low advertiser attraction.

- **Decline in web traffic**
- ➢ Customers tend to get enticed by new innovative features. Every site needs those to stand out from the competitors.

Solution

- **Increase web traffic**
- ➢ Add an unique web functionality, thus making new customers.
- ➢ Give customer what they like by understanding most used car pattern.
- ➢ Advertisers follow the traffic.

boost web
traffic

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Approach

- Scrape the website to collect the car data for the fiscal year 2016-17 from the eBay motors portal for below analysis.

- Launch a price predictor feature on the website

  Attract new and retain existing customers by enticing them to the unique price predictor model built in R using the approach of **Regression**.

- Understand what makes the car more saleable

  Identify all the model specifications acting as predictors that increase the probability of car being sold by performing **Classification** with class labels "sold" and "not sold".

- Understand what customers want

  Identify the car brands that are popular among customer by performing **Text Analysis** on car brands.

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Model Details

Data Preparation

Model Planning

Model Building

Data cleaning and pre-processing:

1. Extreme and sparse values are removed by:

   a. Discarding price greater than 150k EUR and less than 100 EUR

   b. Discard cars older than year 1975 or newer than 2016

   c. Discarding cars with Horsepower less than 750

2. Cleaning with filtering, removing null values, extreme values and outliers

3. '**gsub**' function – for pattern matching and replacement

4. '**Mice**' package for missing values

5. '**VIM**' package for visualization and imputation

6. Conversion of categorical to numeric values using dummy variable

7. Conversion of German words to English

8. Null values replacement with 'others' category

9. Columns providing less information are ignored

Data Preparation

- Number of Records : 371537 observations of 20 variables

car data

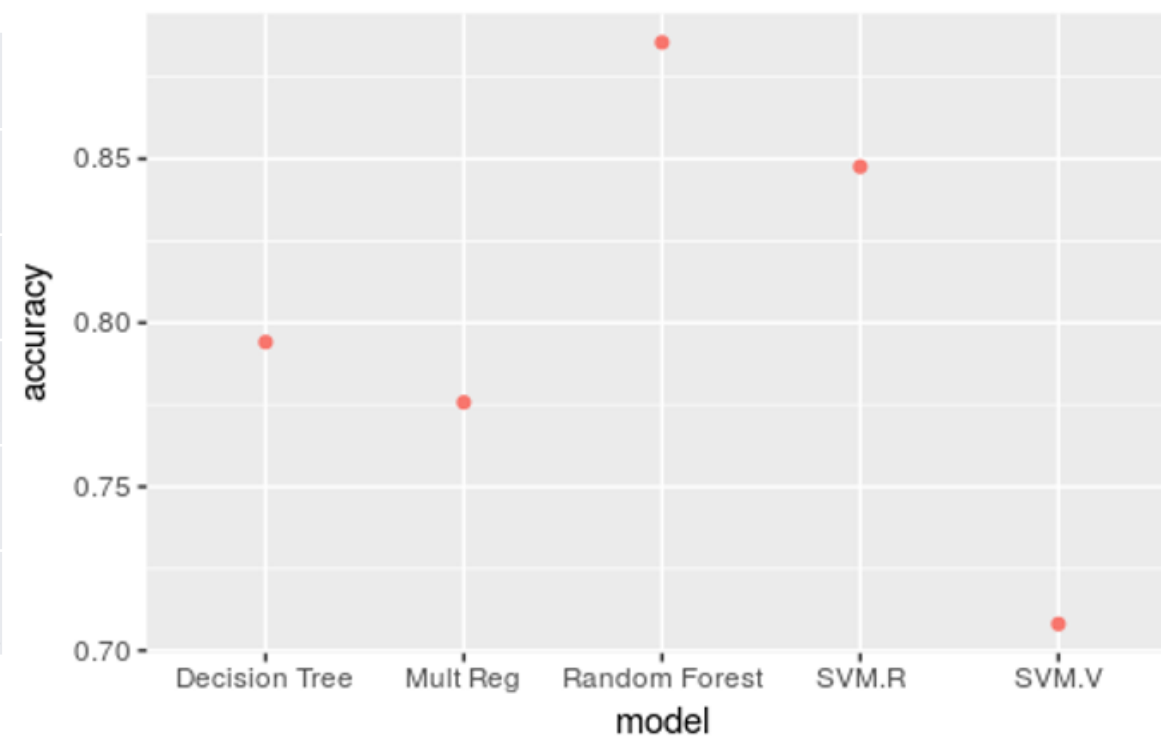missing value plot

Model Planning

Model Building

Regression Analysis

Price Prediction Models

Model Planning

Model Building

Model Name	Correlation measure
Multiple Regression	0.7757
Decision Tree	0.7941
SVM with rbfdot	0.847
SVM with Vanilladot	0.7081
Random Forest	0.88

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Model Building contd.

Data Preparation

Regression Analysis

Decision Tree Model - pruned

Model Planning

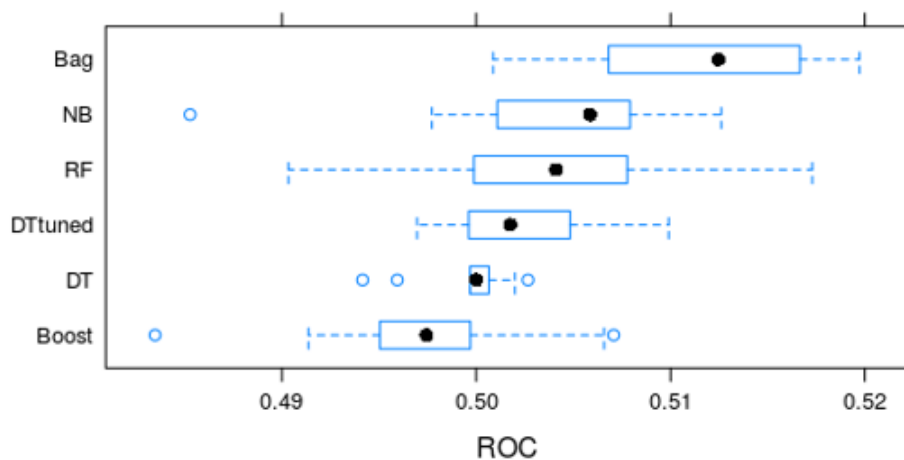**Model Building**
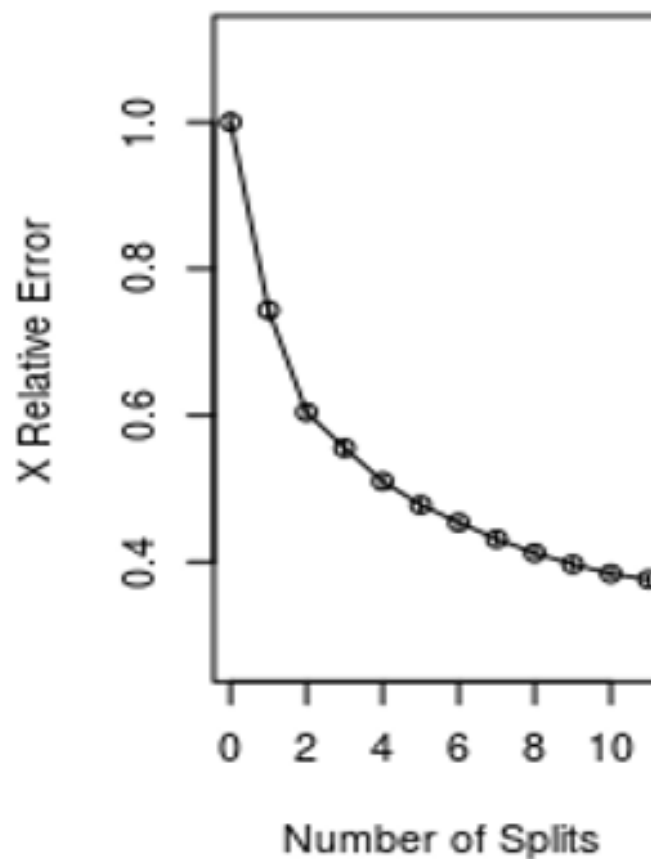
Model Building contd.

What makes the car more saleable, 'Sale' or 'No Sale'
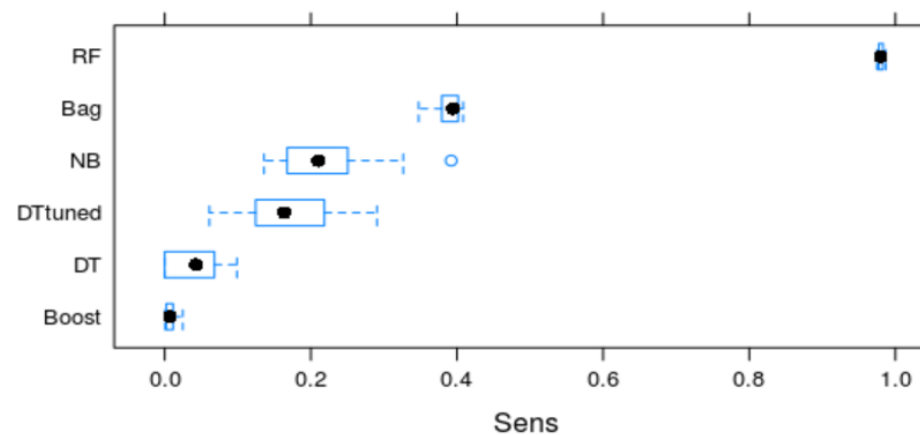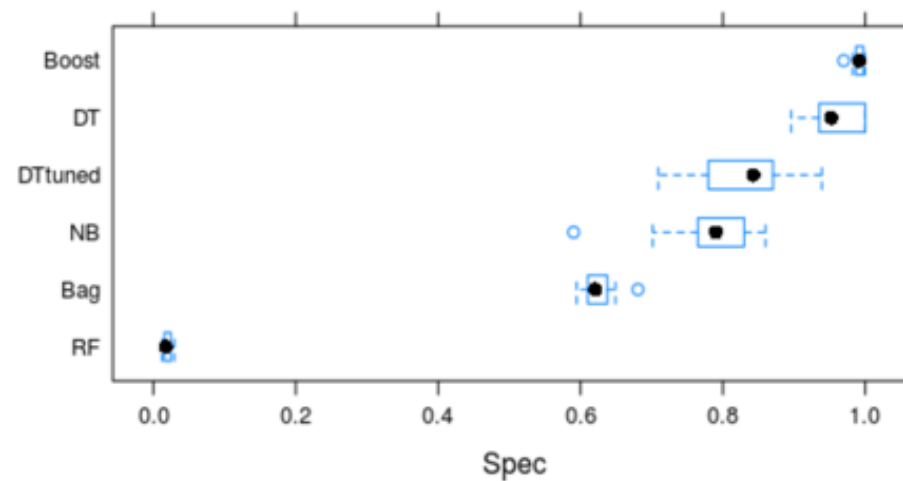

Models :
Bag: TreeBag
NB: Naïve Bayes
RF: Random Forest
DTtuned: DT with tunelength 15
DT: Decision Tree with 10 fold CV
Boost : ADA boost

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Key Points and Findings

Objectives and Results

Regression Analysis	Price Prediction Model (75% accuracy)
Classification	Sale probability Analysis (50% accuracy)
Text Analysis	Most Sold Car Brands Analysis

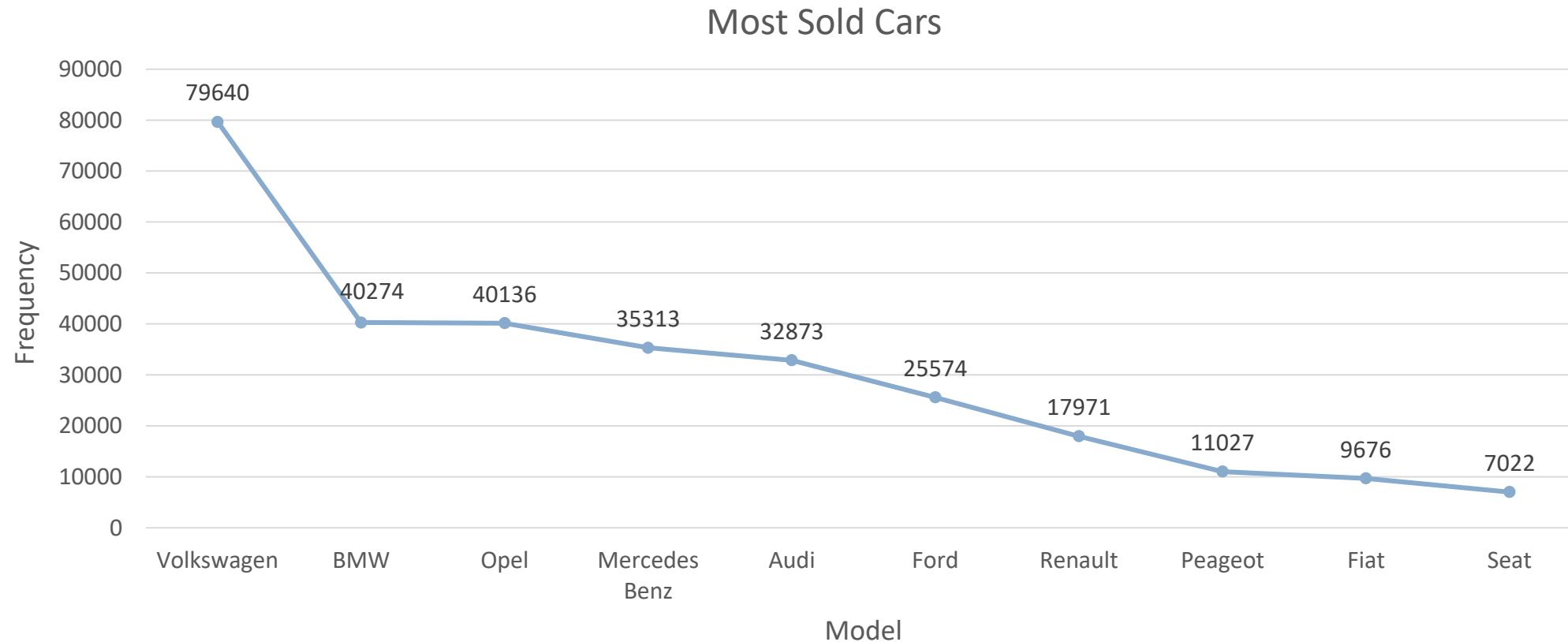REVENUE ANALYTICS™

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Key Points and Findings

Text Mining Analysis - Wordcloud
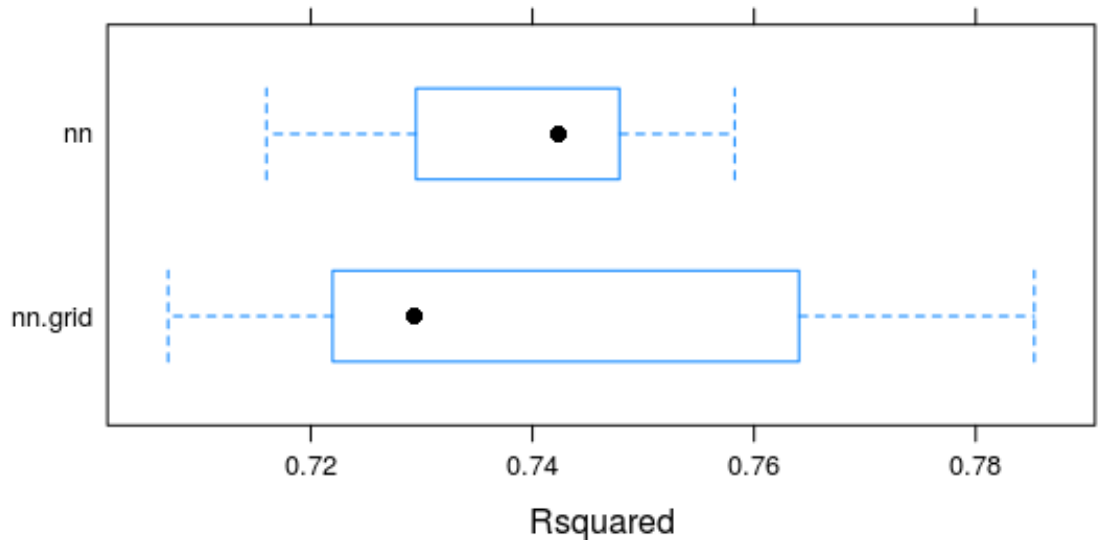
1. Volkswagen
2. BMW
3. Opel

Key Points and Findings

Most Sold Cars

Key Points and Findings Contnd.

Status Quo

- Improvement of price prediction model accuracy by using neural networks.

- Improvement of classification model for more than 50% accuracy.

- Further data research to increase overall performance of models.

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Recommendations

- Implementation of a yearly "most sold cars list" on the web portal of ebay motors.

- Pilot Project of tested price prediction model within a segmented customerbase in order to observe the acceptance (surveys) and usage of the feature.

- Extension of the consulting project to guarantee a better reliability of models particularly of the classification model.

- As a further step we would recommend to analyze the revenues and web traffic of ebay motors US one month post the final launch.

Thank you for your Attention!

Any Questions?