# Analytical Project on Brazil eCommerce Olist's Business Performance

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# Introduction

The purpose of our project is to use analytical tools to study Olist e-commerce platform, Olist is the largest e-commerce site across Brazil that connects all Brazil-based small businesses to sell products on its e-commerce platform. We will be focusing on:

- Seller side to increase sales
- Customer needs and satisfaction
- Overall Website Performance to attract more customers

# Dataset

#### **Brazilian E-Commerce Public Dataset:**

- Consists of over 100,000 online transactions between mid-2016 and mid-2018.
- Contains 30 variables on the information of the transaction, product, seller, and customer.

### **Marketing Funnel Dataset:**

- Was collected from sellers that filled-in requests of contact to sell their products on Olist.
- Consists of 8,000 leads that requested to join the Olist e-commerce platform between 2017 and 2018.
- They were randomly selected from the total leads.
- Allow views of a sales process from multiple dimensions, such as business type, average stock, lead category, catalog size, behavior profile and etc.

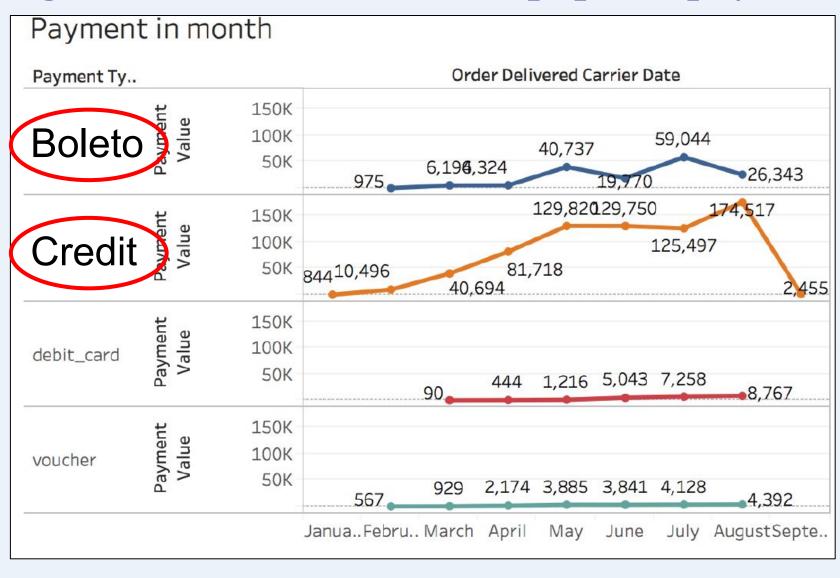
- Used Tableau to do the Exploratory Data Analysis to visually summarize the main characteristics of the datasets. We viewed orders from multiple dimensions: from sales performance, payment method, and product attributes to customer reviews and marketing channels.
- For supervised machine learning, we first made hypotheses on the factors that would affect review scores (Y). Then used forward and backward methods to prove their significance. Finally, used Random Forest and XGboosting to build model with significant variables. The model would help the sellers predict their review scores and make proper business decisions.
- For unsupervised machine learning, we used text analysis to gain valuable service insights from comments written by the customer. The top topics returned from the results would reflect the problems that the sellers have.

# Figure A. Overall Sales Performance in 2017



- In 2017, the overall sales volume showed an upward trend, as it is a fast booming business that just founded two years ago.
- The sales volume reached a peak in December, due to national holidays

### Figure B. Beloto is the most popular payment method in Brazil



- Brazilian users prefer credit card payment and offline transaction method Beloto.
- Both payment methods grow more rapidly in a year.
- We would suggest new sellers to provide Boleto as one of the payment methods to better assist Brazilian customers.

Most potential sellers contacted Olist

through paid search and organic search.

• The number of potential sellers was much

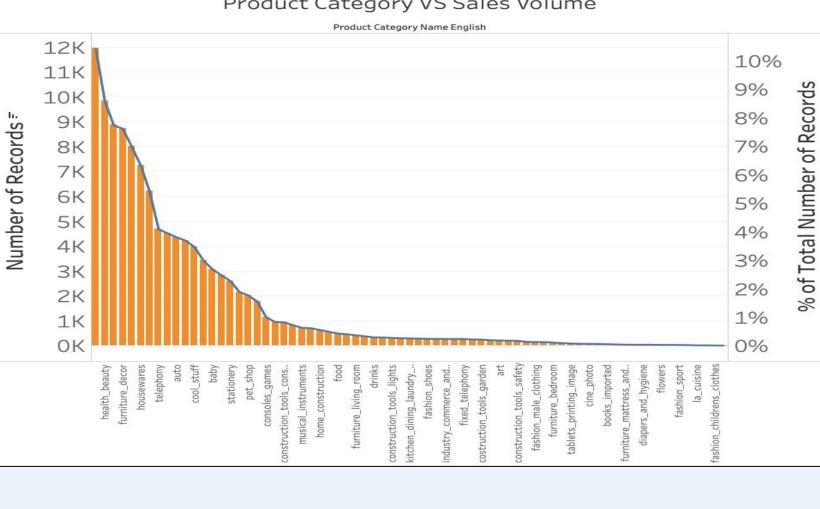
#### Figure C. Marketing Qualified Leads Volume by Marketing Channel

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Paid Search	152	259	448	392	116
Organic Search	383	273	218	362	135
Unknown	834	144	140	102	96
Social	188	56	38	130	39
Direct Traffic	67	12	27	81	33
Other	6			93	
Referral	16	2	1	30	29
E-mail	1	16	5	2	
Display		6	1		
Total	1647	768	878	1192	448
N of New Sellers	71	72	64	93	45
Conversion Rate	0.04	0.09	0.07	0.08	0.10

2018.1 2018.2 2018.3 2018.4 2018.5

higher in 2018 than it is in 2017 and so did the number of new sellers. • Some of the potential sellers converted to sellers and the conversion rate is unstable.

Figure D: Product Category by Sales Volume • 20% of the products brought nearly 80% Product Category VS Sales Volume



- of the total revenue, meaning that the sales volume is seriously polarized.
- The sales volume of many product categories is close to 0, and the sales volume of the top categories is far ahead.
- A limited selection of product types for customers may lead to insufficient products to meet customer needs.

# Discussion

- Data contain NAs and not up to date, so the results may be partial with low reliability.
- We only have completed data of 2017 and there is no other full year's data to compare and to support our findings.
- In text analysis, two topics are too closely related because there are only 36,000 reviews out of 100,000 orders, may lead to biased results.

# Results

### Figure E. Word Cloud



chegou

- Delivery status and product quality are the two main topics that customers care about and result in higher review scores.
- Customers with positive shopping experience on Olist are more likely to recommend the platform and products to others.
- For sellers, they are able to improve their current service quality through product service and logistics service.

Results from Supervised Machine Learning tell us

## Figure F. Variable Importance

Figure G. MSE Comparison

Linear

Regression

Random

Boosting

Forest

	9	
	${\tt IncNodePurity}$	rownames(importance)
1	1365.29563	delivered_days
5	888.79392	payment_value
2	755.50874	freight_value
4	727.27485	price
3	638.52315	product_weight_g
6	469.62263	product_width_cm
7	314.89008	payment_installments
8	57.12157	payment_sequential
4 3	727.27485 638.52315 469.62263 314.89008	product_wei product_wid payment_install

1.42

1.19

Train MSE | Test MSE

the factors that affects <b>Review Score</b> (Y).
We used forward and backward selection to
eliminate meaningless variables.
Then we randomly set 70% data as the training
set and 30% as the test set. The models that we

Linear Regression

built are as the followings:

- RandomForest
- XGboosting

# We chose **Random Forest** as the fittest model as it has the lowest MSE (1.12).

Random Forest returned the top four important variables are:

- Delivered days
- Payment value
- Freight value
- Price

Any improvement on these variables can potentially increase the review score and customer satisfaction.

# Conclusions

- To improve Olist Sellers service, Olist sellers should set up social media care and live chat to increase the efficiency of customer support and to help with more urgent cases to gain direct feedback from customers and increase review score.
- To increase Olist customer satisfaction, new coming Olist sellers should provide Boleto as one of the payment methods, as many find this convenient. More convenient method options can help to increase the speed of payment, simplify online shopping process, and shorten online shopping delivery time.
- To increase Olist Platform overall quality, Olist can recruit more diversified sellers on its platform to increase its diversity and to attract more potential buyers or set up a reward system that can award customers for their purchase.

## References

Olist. (2018, November 16). Marketing Funnel by Olist. Retrieved from https://www.kaggle.com/olistbr/marketing-funnel-olist Olist. (2018, November 29). Brazilian E-Commerce Public Dataset by Olist. Retrieved from https://www.kaggle.com/olistbr/brazilian-ecommerce#olist\_order\_payments\_dataset.csv

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