

Analysis of E-Commerce in Brazil

——Evidence from Olist

Team: longview

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Context/Domain/Market of Consultancy

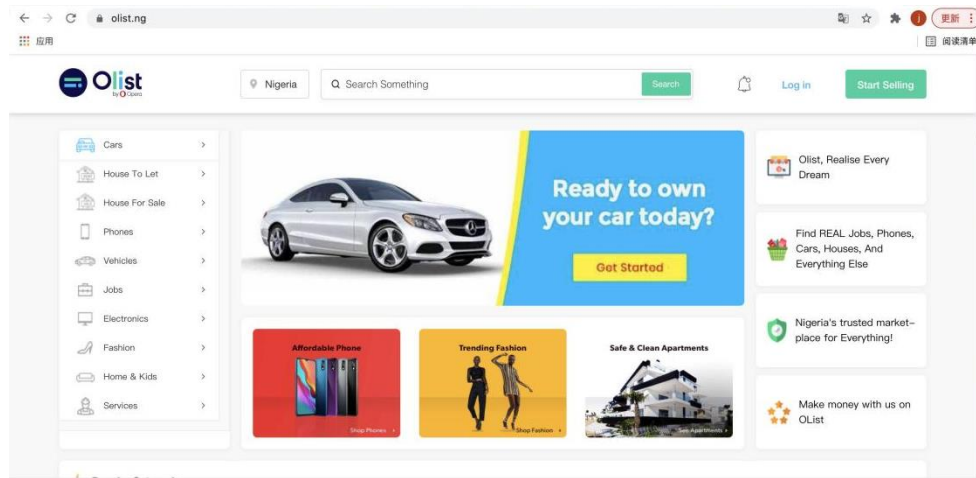


Figure 1. Official website of Olist

Olist Background

Olist was founded in 2015 with the mission of helping small merchants gain market share across the country through a SaaS licensing model to small brick and mortar businesses. The primary industry for Olist is Media and Information Services (B2B). Olist connects small businesses to larger product marketplaces to help entrepreneurs sell their products to a larger customer base.

As of October 2019, Olist had more than 200,000 customers and used a drop-shipping model to send products directly from stores to clients around the country, allowing them to grow with a capital-light model. Today, Olist says its platform provides tools that support “all the stages of an e-commerce operation” with the goal of helping merchants see “rapid increases in sales volume.” It currently has about 25,000 merchants on its platform.

The startup is no doubt benefiting from the pandemic-fueled e-commerce boom taking place all over the world as more people have turned to online shopping. Latin America, in general, has been home to increased e-commerce adoption. The region’s \$85 billion e-commerce market is growing rapidly, with projections of it reaching \$116.2 billion in 2023^[1].

Olist was launched by Opera the owners of OPay and enables users to deal in a variety of different goods and services be it old or new. It included categories like jobs, real estate, agriculture, maintenance, automobile, and constructions. The platform simply bridges the gap between people that need certain items or services and people that have the goods or services to offer, it then connects them together hereby satisfying both the buyer and the seller free of charge. On Olist advertising, buying and selling on the platform has been made very easy to use, and it is free of

charge. The prices you get on it are always reasonable and there is no limit to the number of ads you can post online.

Transaction process

After a customer purchases the product from Olist Store, a seller gets notified to fulfill that order. Once the customer receives the product, or the estimated delivery date is due, the customer gets a satisfaction survey by email where he can give a note for the purchase experience and write down some comments.

Market Background

Different from American and Chinese merchants, who were able to nearly saturate their digital penetration with a single integration, Brazilian merchants faced the operational burden of manually integrating with the numerous existing marketplaces. In order to fully grasp the benefits of selling online, the typical mom-and-pop shop had to use 7 different systems to access the more than 5 dominant marketplaces, all while needing to understand taxation in 27 states in order to comply with government requirements^[2].

Brazil is the world's population ranked sixth. The penetration rate of e-commerce users reached 49.4%. Electricity users in the Brazilian electricity growth potential are huge. In addition, the Amazon in Brazil average revenue per user (total income/users) is \$201.75. In terms of electricity, the Brazilians prefer to use the smartphone to buy products. mobile electricity accounts for one-third of total trading; However, 48% of respondents said that the most important feature of mobile e-commerce is the option to place orders online and pick up goods offline. Credit cards are the most popular method of payment, although Brazilians prefer Boleto Bancario.

According to Statista's 2019 assessment, the top 3 hot categories in terms of sales share in line with other national markets are:

- Fashion Apparel and Accessories (21%)
- Entertainment (14.9%)
- Beauty perfume and Health (12.5%)

Competitors

Ranking of Shopping websites in Brazil (Top 10)

(1) Mercadolivre.com.br

- (2) Aliexpress.com
- (3) americanas.com.br
- (4) olx.com.br
- (5) bomnegocio.com
- (6) submarino.com.br
- (7) buscape.com.br
- (8) netshoes.com.br
- (9) admngroonline.com
- (10) walmart.com.br

Brazil Shopping Festival

(1) Black Friday

The big discount retail event was first held in Brazil in 2010, and since then, Black Friday has become the most anticipated sales day of the year. Historical data shows that Black Friday has become more popular in online retail, even stealing the spotlight from Christmas, and breaking new records every year. In Brazil, Black Friday lasts about a week, with specials on the days before and after the official holiday. The items most likely to be purchased on Black Friday are smartphones, computers, home appliances, clothing, sneakers, and perfume.

(2) Christmas

Christmas is still very strong, accounting for 5% of annual sales, second only to Black Friday.

(3) Special Days

Some other shopping holidays are statistically very prominent, such as Mother's Day, Father's Day, and Children's Day. In many countries, Father's Day is in March, but in Brazil, Father's Day is in August and accounts for 4% of annual online sales. Rarely celebrate children's day all over the world, but in Brazil, children's day is on October 12, is an important festival, the fifth people's attention to toy games and electronic products is very high. Valentine's day is held in February from all over the world, but Brazil is celebrated on June 12 and people focus more on clothing, perfume, and drinks. Also, there is strong interest in tourism and other areas.

Focus of Consultancy

The digital world is always full of challenges, especially add increasing customer expectations and digital business models growing taking more difficulties to e-commerce operation. Actually, Amazon pushed the first retail ecosystem in the world, and this retail model got a big success in China. E-commerce enterprises like Alibaba Group built an open and online retail ecosystem in several years, providing one-stop service for consumers, helping retailers get access to millions of potential consumers. In Brazil, we also need an industry giant to develop the South American market and also provide sufficient trading needs for thousands of people.

According to McKinsey's research, 20 percent of B2B buyers said they would be willing to spend more than \$500,000 in a fully remote/digital sales model. And 11 percent of all B2B buyers would spend more than one million. As more and more customers prefer to purchase remotely, Olist as the most potential platform in the Internet retail industry has been facing more opportunities and challenges in this digital competing system with other rivals. We help the platform across all sectors: fashion, leisure, estate, beauty, and health to develop and implement tailored strategies which solve current problems and more significantly identify and address potential challenges.

Consultancy Mission

In this case, our company aimed to provide a robust, completed, and professional suite of e-commerce solutions that spans marketing strategy, platform operations, brand and image build, user experience perfecting through business analytics. We'll approach this process by focusing on four subjects, platform, customers, products, and services, launching a tendency observation of key index of data set of Olist in 2017-2018, exposing every point that influenced the sales, and then evaluating the overall operation and the direction needs to be changed. Our destination is to make Olist the most powerful online transaction platform in Brazil and even in all South American. Therefore, the first part is to raise awareness. In this part, we need to concentrate on consumers and services. Through the purchasing analysis of users, we are able to find and attract more high-quality consumers for Olist and build a well-known brand image. The second part is to raise margins after the operation analyzing of platform and marketing analyzing of products. We believe there is a lot of abundant experience we have in the e-commerce market that could help to explore and expand the current and potential B2B market.

Business Value of Consultancy

After the analysis, we will give our professional advice on how to increase market share and decrease the users lost. The specific way to follow the dynamic of competitors will be listed as well. We will also help our client ensure a fine user-scale growth pattern, like how to attract users, convert potential customers into buyers, develop loyal users, optimize the user experience, elevate the repurchase rate, and improve the average conversion rate combined with multiple marketing manipulations. An annual marketing plan with different categories of products and a whole operation strategy will be shown as a final solution. In this report, we recommend two ways to discuss about the Olist marketing Strategies.

Customers

Target on the first part, users, we'll give a comprehensive layout of user analysis focusing on digital self-serve, contains every type of consumers and merchants, every kind of purchase motivation, user requirements, user characters categorized by different geographic zones. Then do the inner comparison with the services provided by the platform so as to intuitive understand where to work on; the outer comparison with tracking the dynamic of competitors analysis, operation strategy analysis, selling strategy analysis, and marketing analysis, know about what field they concentrated on, so as to adjust our strategy in time and also use for reference. This is conducive to the operational upgrading of the digital platform revolution. Eventually, given advice will show how to attract users, convert potential customers into buyers, develop loyal users, optimize the user experience, elevate the repurchase rate, and more. When it comes to image, we know that if you have enough user foundation and praise from customers, we don't worry about the increase of users and deals. It always has been a virtuous cycle for a platform to run in this way.

Margins

For the second part, what is identified first is going to be the market share and competitive features. With a good understanding of marketing, we are able to help the client to figure out the problems in their current operating model and selling strategy. The E-commerce ecosystem depends on the market. We have the successful case of Taobao in Asia Pacific markets and E-bay in the North American market, but for Olist, a customized solution will be made on considering such elements that are listed below:

▣Population Density

▣Age Composition

▣Electronics Popularity

■ Logistic Capability

■ Scale and Maturity of Traditional and Online Retailer

By pointing out the most popular types of items, the most important domain, we could know which region, category, the product should get more attention and input. We'll also research that what indexes have an effect on the result of sales except for the product itself. While we need to point out the weakness of push-based ads and the model of VAS to find a better way to help Olist build a healthy relationship with businesses and merchants and increase advertising revenue and VAS margins at the same time. Finally, we will offer the method to explore new markets and take over existing market share, to improve the average conversion rate combined with multiple marketing manipulations.

Data Quality Assurance

Olist Data overview

This is a Brazilian ecommerce public dataset^[3] of orders made at Olist Store. The dataset has information of 100k orders from 2016 to 2018 made at multiple marketplaces in Brazil. Its features allows viewing an order from multiple dimensions: from order status, price, payment and freight performance to customer location, product attributes and finally reviews written by customers.

Table Name	Explanation
olist_customers_dataset.csv	Information about customers and their locations
olist_geolocation_dataset.csv	Brazil postal code and its latitude/longitude information
olist_order_items_dataset.csv	Data of the items purchased in each order
olist_order_payments_dataset.csv	Order payment data
olist_order_reviews_dataset.csv	Data on reviews made by customers
olist_orders_dataset.csv	Order transaction data
olist_products_dataset.csv	Data on products sold by Olist
olist_sellers_dataset.csv	Olist data of sellers who completed orders
olist_caategory_name_translation.csv	Translate product names from Portuguese to English

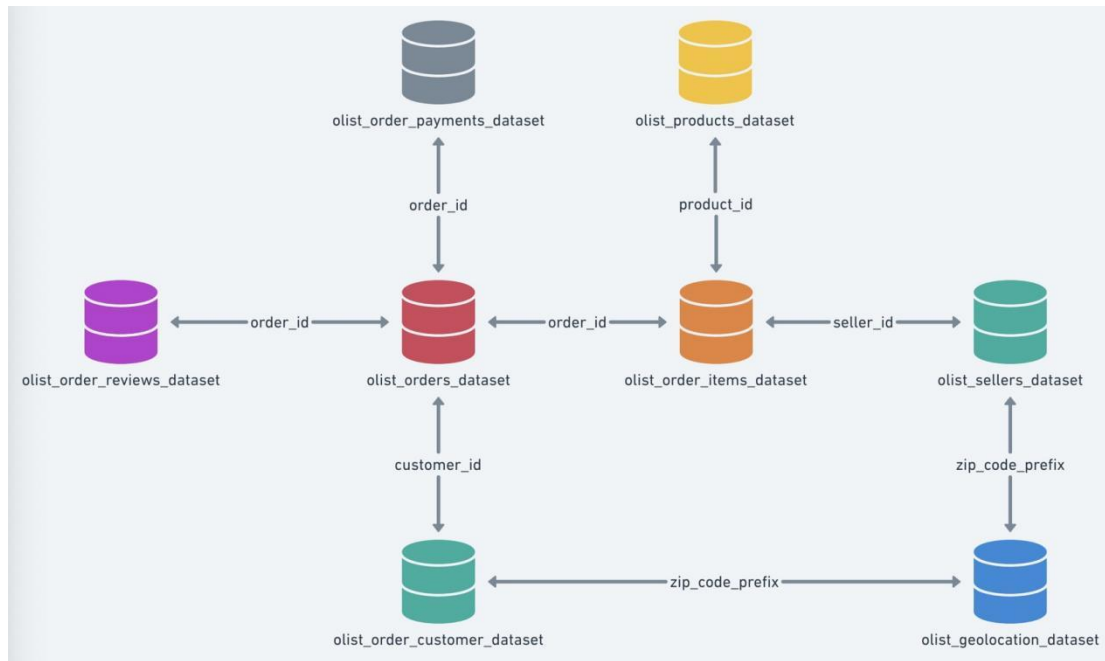


Figure 2. Data Schema

Data Cleaning

1. Download the data from the website completely and double check the completeness, continuity, and correctness of the data against the links with the data given on the website.
2. Join the data together with Tableau Prep and check if there are duplicate items in the inner join data.
3. Complete the data calculation for the later analysis in Tableau Prep, like Ship Days, Price value, and so on.
4. Excluding the data for 2016, because the company was established in 2015, the data for 2016 only contains the first three months. Also, 2016 is in the early stage for the marketing circle, so the comparison with subsequent years is not reliable.
5. For the missing data, our missing value are very few and they are in a very long continuous data, so we replace the missing values with the mean of near point.

Additional Data Sources

In addition to the data of Olist dataframe, cities and states in Brazil also need to do certain macro analysis, such as the population distribution, consumption level, and policy impact of this

city/state. This will help us give more targeted and professional opinions on Olist's market planning.

Therefore, based on the data of Olist, we went to Google to find the data of Brazil's population and consumption level in the corresponding year. After that, we did some verification and screening work on the network data. Finally, this additional information data is matched with the original Olist data. The attached table is an example of additional information data.

Table 1 : An example of additional information data

State	Consumption_Level	Population
Pará	10596	8600000
Mato Grosso	16812	3480000
Amazonas	10224	4140000
Goiás	15096	7020000
Mato Grosso do Sul	17856	2780000
Rondônia	14028	1780000
Tocantins	12720	1570000
Distrito Federal	29700	3020000
Amapá	10716	850000
Roraima	11796	610000
Acre	11004	880000
São Paulo	21768	45920000
Paraná	18096	11430000
Rio Grande do Sul	21108	11380000
Santa Catarina	19584	7160000
Rio de Janeiro	20676	17260000
Minas Gerais	15768	21120000
Espírito Santo	16164	4020000

Bahia	9552	14870000
Pernambuco	10764	9600000
Maranhão	8112	7100000
Ceará	12336	9100000
Alagoas	9552	3300000
Sergipe	12336	2300000
Paraíba	10704	4000000
Piauí	10308	3300000
Rio Grande do Norte	12924	3500000

Data Visualization and Interpretations

Services

Review Scores

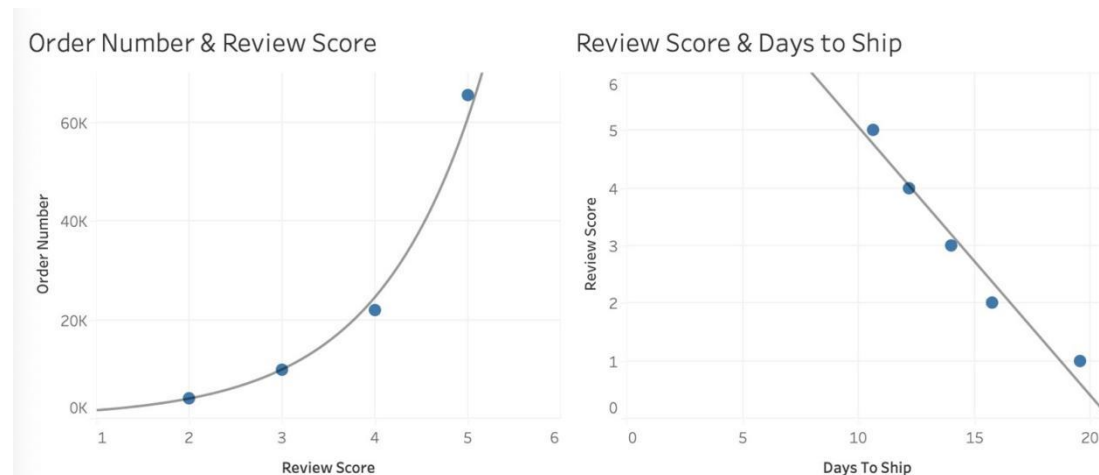


Figure 3. Review Score & Order Number/ Review Score & Days to Ship

We discussed the relationship between days to ship and review score, and the relationship between review score and order number.

In the Order Number & Review Score chart, you can see that when the review score increases, the order volume will increase correspondingly, showing a linear regression relationship in direct proportion. Products with a Review score of 5 have sales of nearly 65k; products with a Review score of 4 have sales of more than 20k; products with a Review score of 3 have sales of approximately 10k. Therefore, every 1 point of review score gap will greatly affect product sales. If Olist can keep customer reviews at 5 points, then product sales will surge. Although it is difficult to do this, it is the fastest way to increase sales. We speculate that this is because when the review score is good, more customers will be trusted to purchase the product. This will form a virtuous circle of high evaluation and high sales.

In the Review Score & Days to Ship chart, the shorter the transportation time, the higher the review score, which shows a linear regression relationship. According to the points on the figure, we can see that when the average delivery time is 11 days, the review score is 5; when the average delivery time is 13 days, the review score is 4; when the average delivery time is 14 days, the review score is 3; When the average delivery time is 16 days, the review score is 2; when the average delivery time is 19 days, the review score is 1. For every additional day or two days in the delivery time, the review score drops by 1 point. This shows that delivery time is an important factor affecting evaluation. Therefore, increasing the delivery speed is the most effective and direct way to improve the review score.

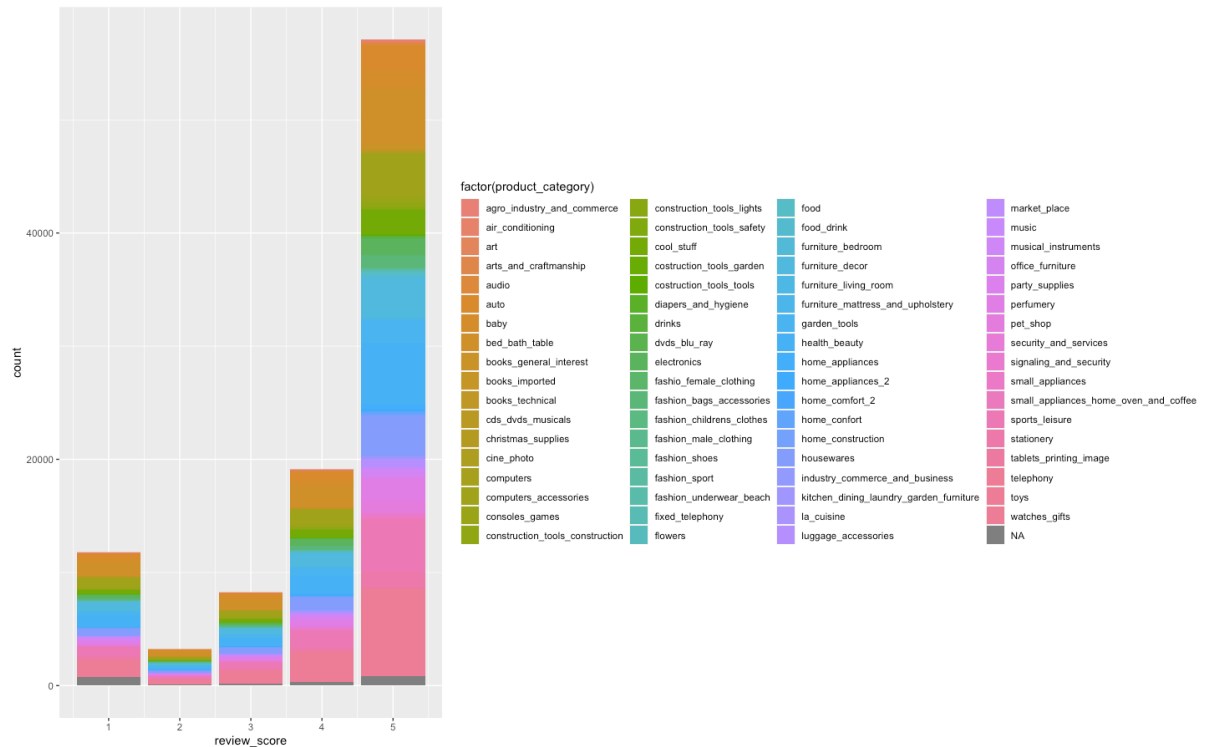


Figure 4. Review Score & Category

Given the direct impact of review score on sales, we are also trying to explore the relationship between categories and review score. Using the bar chart to show the number of products in each category in each review score. However, it is found that there is no significant direct relationship between category and review score. It can be seen that in each score, the proportion of each category is very even. This indicates product category has no direct influence on the review score. However, products with 5 points and 4 points are the most. Some aspects can indicate that customers are more inclined to buy products with high review scores. Comparing the impact of product categories on review score, we conclude that the impact of days to ship is greater.

To conclude, it is essential for businesses to encourage reviews because more and more customers rely on the opinions and experiences of others when making their purchasing decisions. Ratings and reviews have the power to reach a larger audience and be more influential (and less expensive) than conventional marketing methods. Online ratings and reviews give customers a voice, increase consumer confidence, enhance product visibility, and can dramatically increase sales. When it comes down to it, online ratings and reviews provide incredible value and benefits that businesses cannot afford to ignore.

We believe that the high rate of negative reviews of Olist Store is one of the reasons why it has not been able to expand more users. Olist Store urgently needs to improve customer satisfaction and save repeat customers. A good brand reputation will make it has more customers. To improve the review score, we provide the following ideas: follow up with buyers; contact those who leave you glowing reviews; contact those who leave you negative reviews; reward those who review.

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Days to Ship

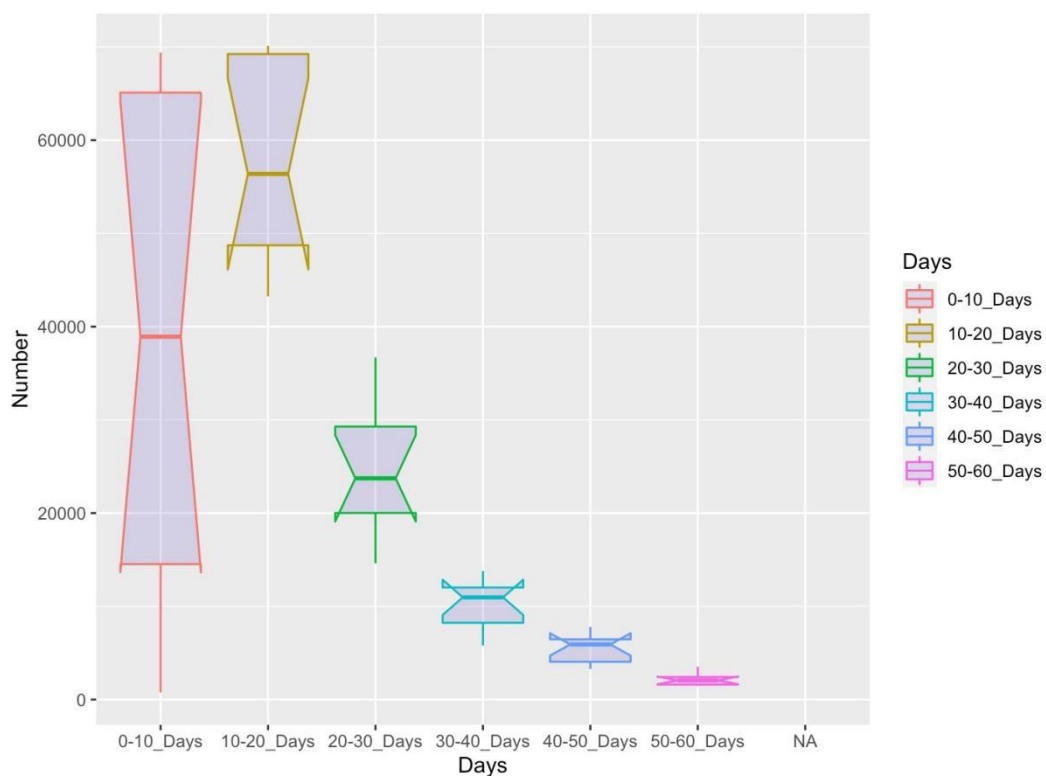


Figure 5. Days to ship

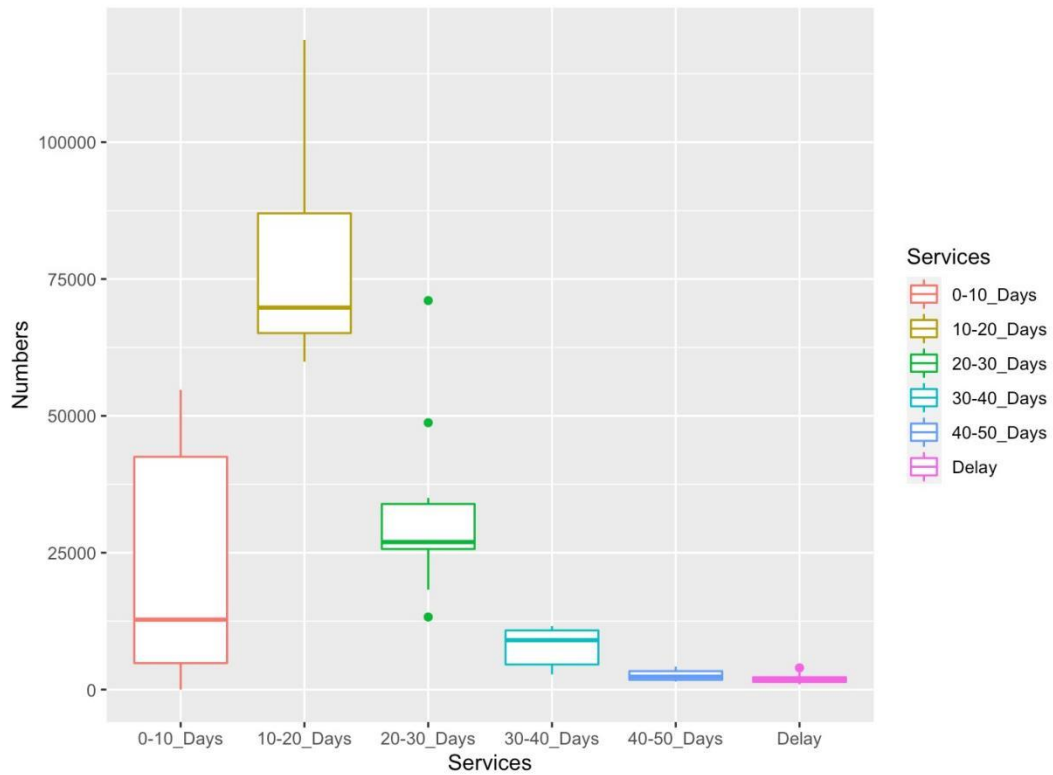


Figure 6. Days difference between estimated & delivered with Outliers

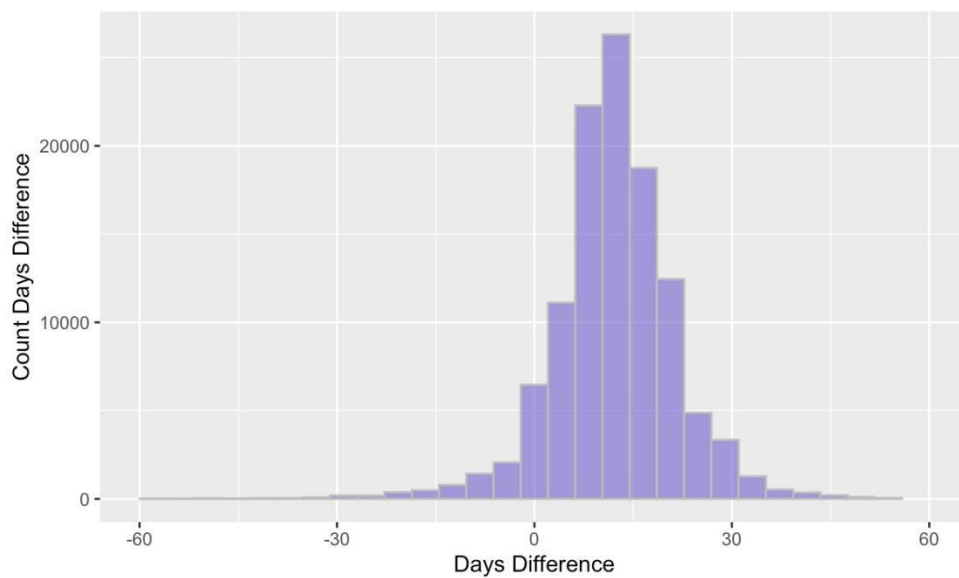


Figure 7. Days difference between estimated & delivered

From the Figure 5 & 6, we can see that the delivery time of most Olist products is between 0 and 20 days, which is much shorter than the estimated delivery days. It is helpful for Olist to win the goodwill and trust of customers. In addition to the quality of the goods, the customer's online shopping is followed by the delivery time. If it can be delivered as soon as possible, customers

will be more satisfied with the service. Almost all Olist orders can be delivered on time or in advance, although there are very few delays. Due to the serious bottleneck of logistics services in Brazil, product delivery fees seriously affect consumers' purchase intentions and decisions. From the Figure 7, we can see that they are more inclined to buy products that provide free delivery services, and the acceptable logistics time limit is 20-40 days. This part also requires Olist to do a certain internal logistics analysis to solve the current problems in logistics.

Olist may also face changes in corporate organization management, production operation management, and product marketing management in the e-commerce era. Logistics as a new source of profits for enterprises, its management innovation should rely on the network and e-commerce, through intensive modern management, to achieve zero inventory and low inventory of merchants, reduce product operation cycle, in order to meet the needs of e-commerce enterprises.

First of all, the development of the logistics industry is the guarantee for the development of e-commerce. From the perspective of enterprises, an efficient logistics system can bring less logistics costs and higher service levels; from the perspective of customers, the final delivery of most product entities must be completed through the logistics system. If the logistics operation efficiency is low, then the many advantages of e-commerce cannot be reflected. Without the support of the logistics industry, e-commerce can only become a castle in the sky and cannot function.

Secondly, the development of the logistics industry has greatly promoted e-commerce. Logistics can improve customer satisfaction and loyalty, and can expand the business scope of an enterprise and bring new market opportunities. For example, for some remote areas, because the volume is not large and the delivery is difficult, the general express company is unwilling to do it, but Olist can solve the distribution problem in some remote areas by subsidizing the express company, which not only expands its business scope, but also increases The revenue of the express delivery company has been reduced, thus achieving a win-win situation.

Customers

Geographical Distribution

Customer distribution

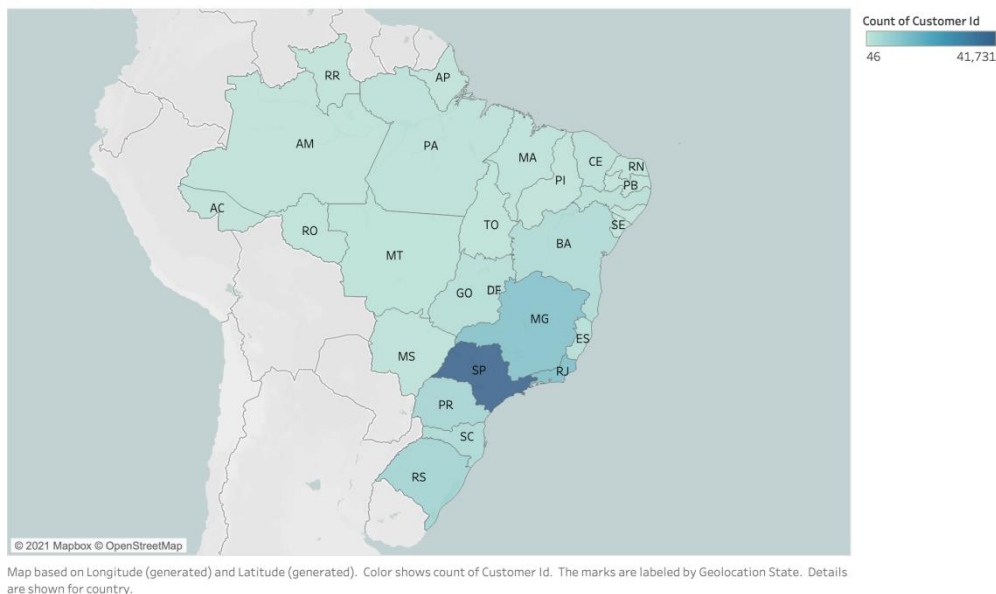


Figure 8. Customer Distribution

Based on the Figure 8, users are very unevenly distributed in states and cities. Olist customers are mainly concentrated in 4 states. The number of customers in Sao Paulo (SP), Rio de Janeiro (RJ), Minas Gerais, Brazil (MG) is at the forefront. Among them, Sao Paulo (SP) is the state with the largest number of customers, accounting for 42.18% of the number of customers. And then, RJ and MG, the gap is really large. Cities with the highest number of buyers are Sao Paulo with 5936 in aggregate, around two times larger than RJ.

From the contribution of orders in cities of Brazil, the capital Sao Paulo's orders far exceed the other cities'. The gap between the Capital and the others is wide, however, there's not much difference between the other cities in north-eastern Brazil. This distribution is basically the same as the distribution of population and economic development.

From the Figure 8, MG,RJ,BA,PR,SC,RS, these states in terms of high payment value in Sudeste are all radiated by SP, and are influenced by the natural advantage of port. We can speculate that there are two reasons, one is that people in developed states have higher income, so the order payment value can be positively associated with earning. The other possible reason is that Olist didn't put much on the other states, and the speed of information spreading towards e-commerce limited the usage rate. When we look at this map except for SP, we can get it more clearly, these

five states surrounding Sao Paulo within the southeast coast have a great advantage of orders, we can make a speculation that this is related to the development and prosperous degree of coastal states.

Shopping Time Preference

Payment Value and Order volume in one day (Base on Product Category)

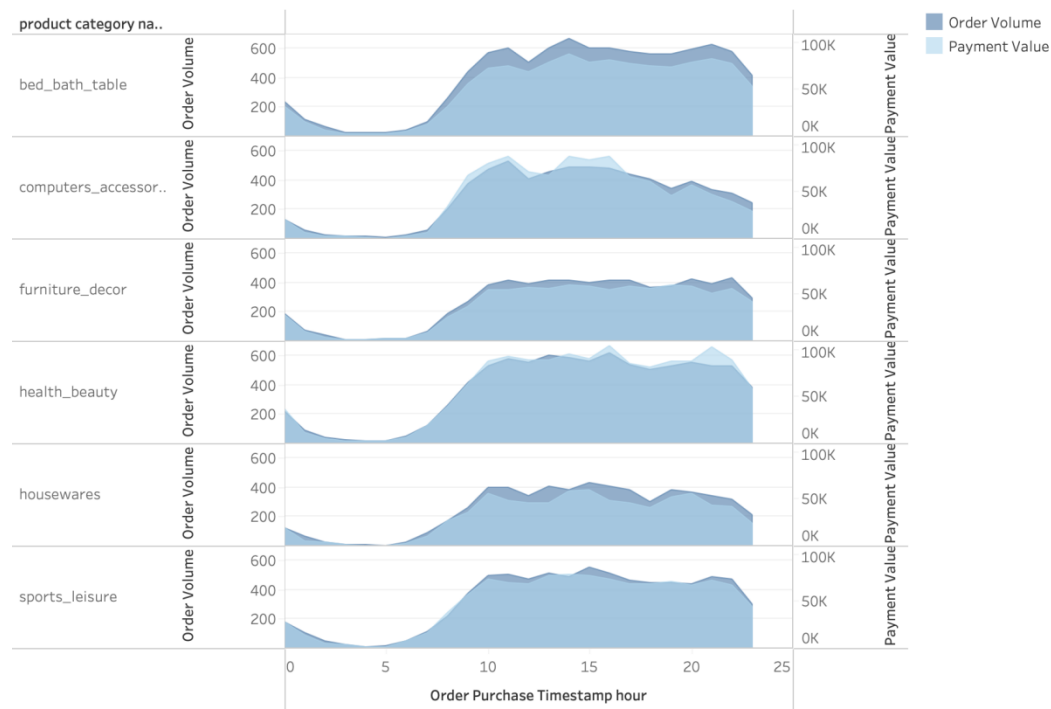


Figure 9. Payment Value and Order Volume in one day

Overall, by analyzing the payment Value and Order volume in one day, which is shown above, we found that on one day the payment value reaches the maximum at 2:00 p.m. Payment value reaches the minimum at 5:00 a.m. and has a rapid growth after 6 a.m. It goes down fast after 10 p.m. The order volume has the same trend as the payment value, but it reaches the maximum at 4:00 p.m. The minimum payment value and order volume are obviously because of rest time. Customers in Brazil prefer to start shopping on Olist after 10 a.m. In the daytime, the payment value and order volume keep at a high level. Then it goes down after dusk.

Then, we analyze the top 6 product categories of payment value and order volume in one day. The product categories which have the top payment value are bed bath table, computer, furniture, health beauty, housewares, sports leisure. As shown in the graph, in some categories, the order volume is higher than the payment value, such as the bed bath table, furniture, sports leisure, and housewares. It means that they have higher order volumes and their unit price is relatively lower. In the top 1 product category, the bed bath table has the best proportion of order volume and payment value, which means that the unit prices of this category are relatively lower. On the other hand, like computers, and health beauty, the order volume is lower than the payment value, which

means that those two products have higher unit prices. By deep look the data, we found that at 3 p.m, the payment value of computer reaches the maximum and the order volume is relatively low, which means that at 3 p.m customers prefer to buy expensive computers, in other words, people who can afford expensive computer prefer to purchase at 3 p.m. according to the data in the category of health beauty, we found that in the night, 8 p.m, the payment value reaches it maximum, which is almost the highest payment value overall. According to customer psychology, people kind of have more not rational consumption at night. They are more likely to have a rush of consumption and buy products that are not cost-effective like expensive makeup and products which are out of their capacity.

In order to help Olist to extend the purchase period in a day, we suggest Olist have a sales promotion in the evening. For example, the order after 11 p.m. can get a 5% refund; the order after 11 p.m. can get extra gifts. Those selling methods can stimulate customers to spend more time other Olist.

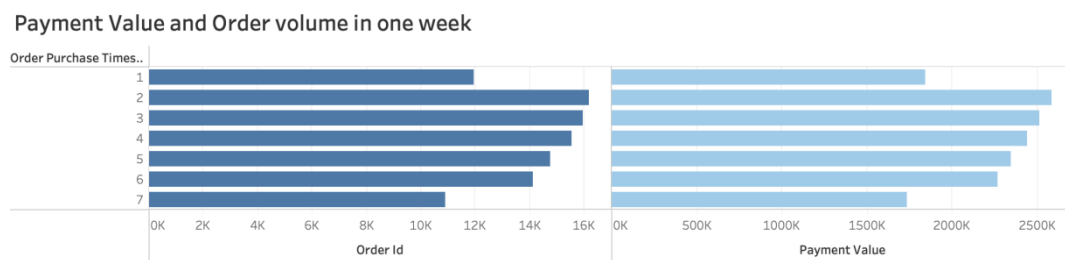


Figure 10. Payment Value and Order Volume in one week

Payment value and order volume in one week show that: the payment value is higher on workdays and is lower on weekends. It reaches the maximum on Tuesday. The order volume is similar to the payment value. Olist customers prefer to shop in the mid of a week. They purchase less on Monday and Sunday. According to the fact that Brazilian have a vacation on Saturday and Sunday, they spend more time on other things rather than shopping on Olist.

Payment Value and Order volume in one week (Base on Product Category)

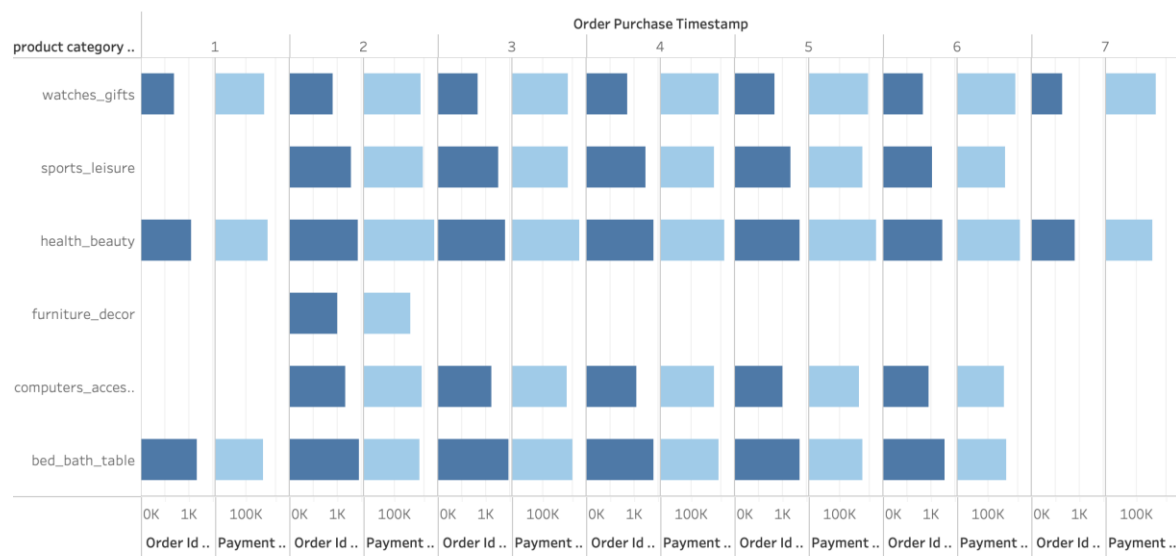


Figure 11. Payment Value and Order Volume in one week

We analyze the top 6 product categories of payment value and order volume in a week. The product categories which have the top payment value are watches gifts, sports leisure, health beauty, furniture, computers, and bed bath table. As shown in the graph, some categories sell every day in a week, like watch gifts and health beauty. Those two products are not the necessity of life. Some categories are sold not on Monday and Sunday, such as sports leisure and computers. It is probably because on Monday which is the beginning of a week, people are busy with other important things like work and study other than shopping online. On Sunday, people in Brazil prefer to enjoy their vacation other than shopping online. The other reason may be that after a week, people may spend all of their money and have no rest money to shopping online. As shown in the graph, we found that furniture is only sold on Tuesday, which may be because Olist has sales on furniture on Tuesday.

In order to help Olist to increase payment value on Saturday and Sunday, we suggest Olist have a sales promotion on the weekend. It can help then to attract customers.

Payment Method Preference

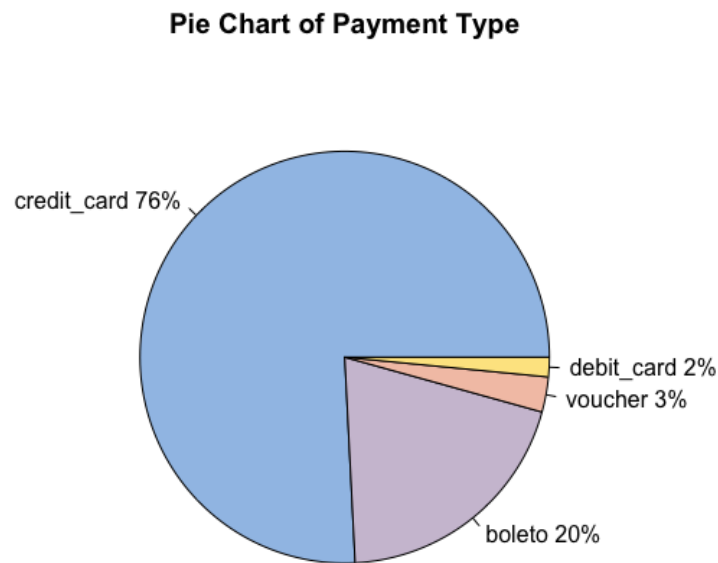


Figure 12. Payment Type

We used a pie chart to analyze the customer's payment type. It was found that up to 76% of the orders were paid by credit card, and 20% were paid by Boleto (the most popular cash payment method in Brazil, similar to the invoice). Vouchers accounted for 3%, and debit cards accounted for 2%.

We also searched for the credit card holding ratio per capita: The population of Brazil in 2017 was 207.8 million, with a total of 82 million active credit cards. The per capita holding ratio of credit cards is 0.39. The population of Brazil in 2018 was 209.5 million, with a total of 99 million active credit cards. The per capita credit card holding ratio is 0.47. The population of Brazil in 2019 is 211 million, with a total of 100 million active credit cards. The per capita credit card holding ratio is 0.47. We predict that the per capita credit card holding ratio is close to saturation, and it is difficult to see a substantial increase. Therefore, Olist should introduce more incentive policies for other payment methods.

From the results, a vast of customers choose credit card payment. We recommend that Olist create more incentive policies to encourage customers to pay through Boleto and debit cards. Reduce the income delay in collection due to the time of settlement with the bank. And publicize more credit card installment policies for expensive products. At the same time, reduce or cancel the handling fee for small installment payments to attract more customers to overdraft consumption and cultivate buying habits. In addition, considering that the elder may need to shop online. We encourage Olist to provide a cash payment policy. Provide cash on delivery, and realize a cash

transaction when the courier delivers the product to a customer.

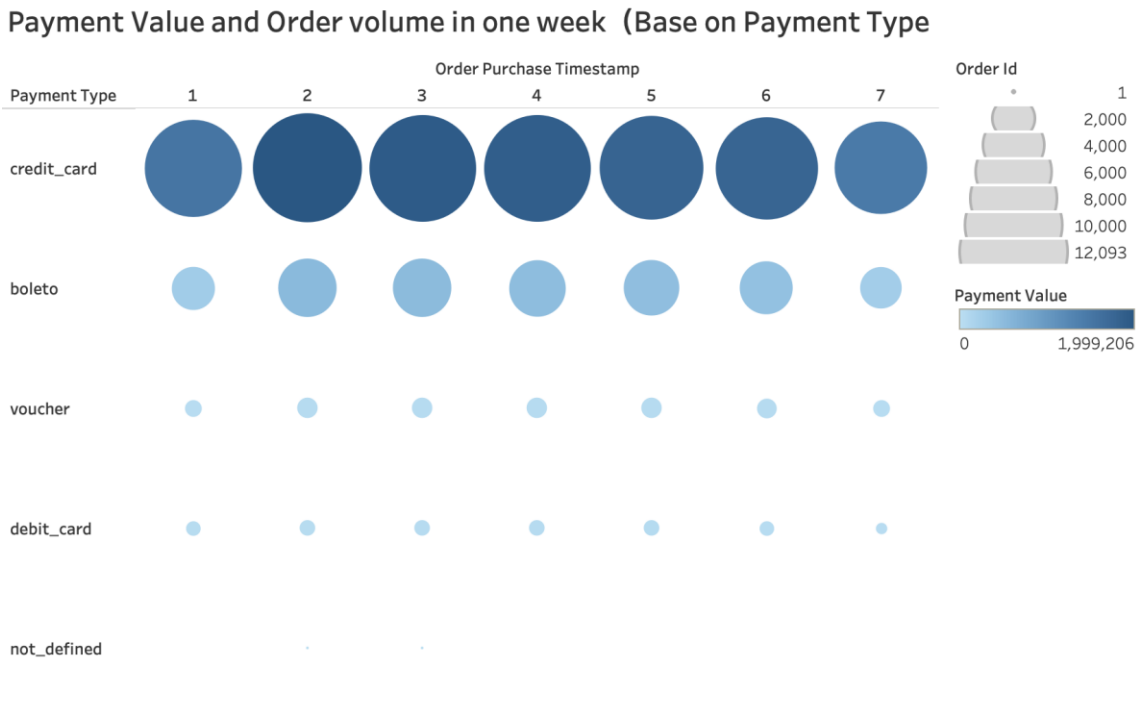


Figure 13. Payment Type

From the Figure 13, we also analyze the payment value and order volume in one week base on payment type. We found that customers prefer to use credit cards. In fact, in average, every people in Brazil have one credit card which can explain why most payment type is the credit card. Customers are more likely to purchase on Tuesday. The second payment type is Boleto which is a kind of purchase platform in Brazil, the full name is Boleto Bancário. Before online banking in Brazil, consumers printed out Boleto (like tickets) and paid at nearby bank branches, ATMs, post offices, supermarkets, and lottery outlets. Now Brazilians have online banking, and many banks have mobile apps that simply scan the bar code or enter it manually to make a payment. Boleto is actually an invoice, which mainly contains the bank, payee information, payer information, payment amount, payment deadline, and other information. the other two payment type has close proportion.

Products

Top 10 Sales Products

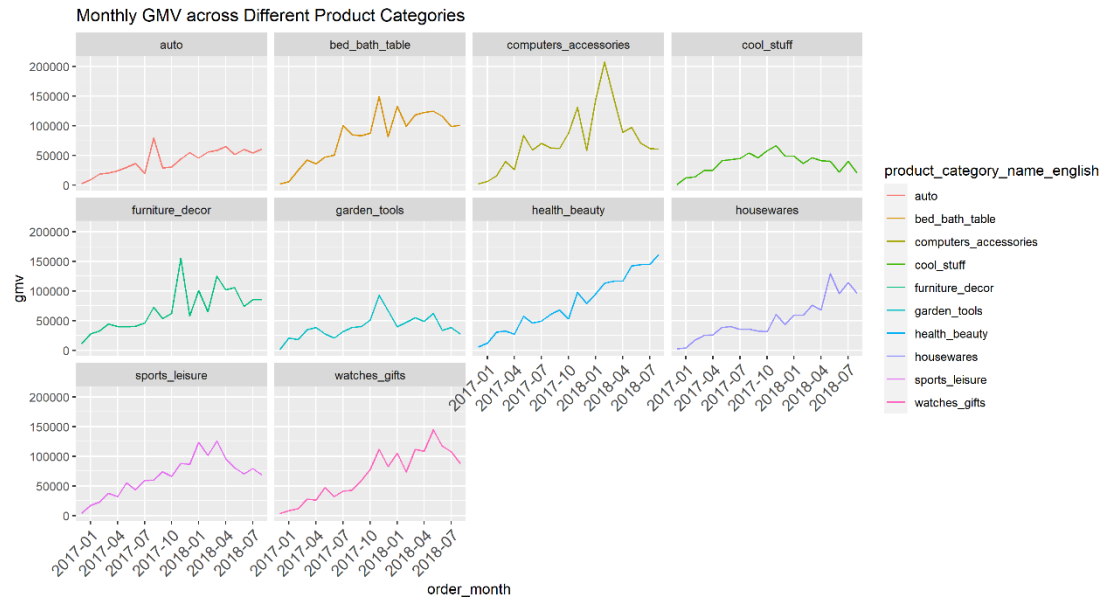


Figure 14. Top 10 Sales Products

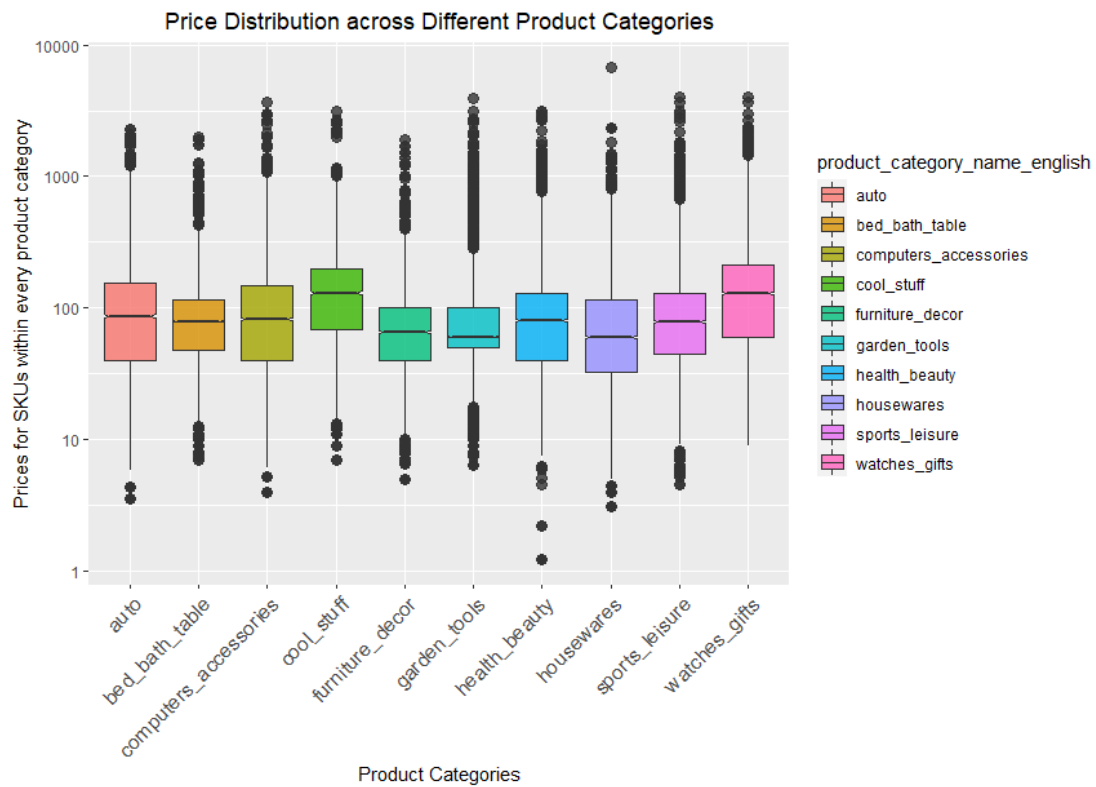


Figure 15. Price Distribution across Different Product Categories with Outliers

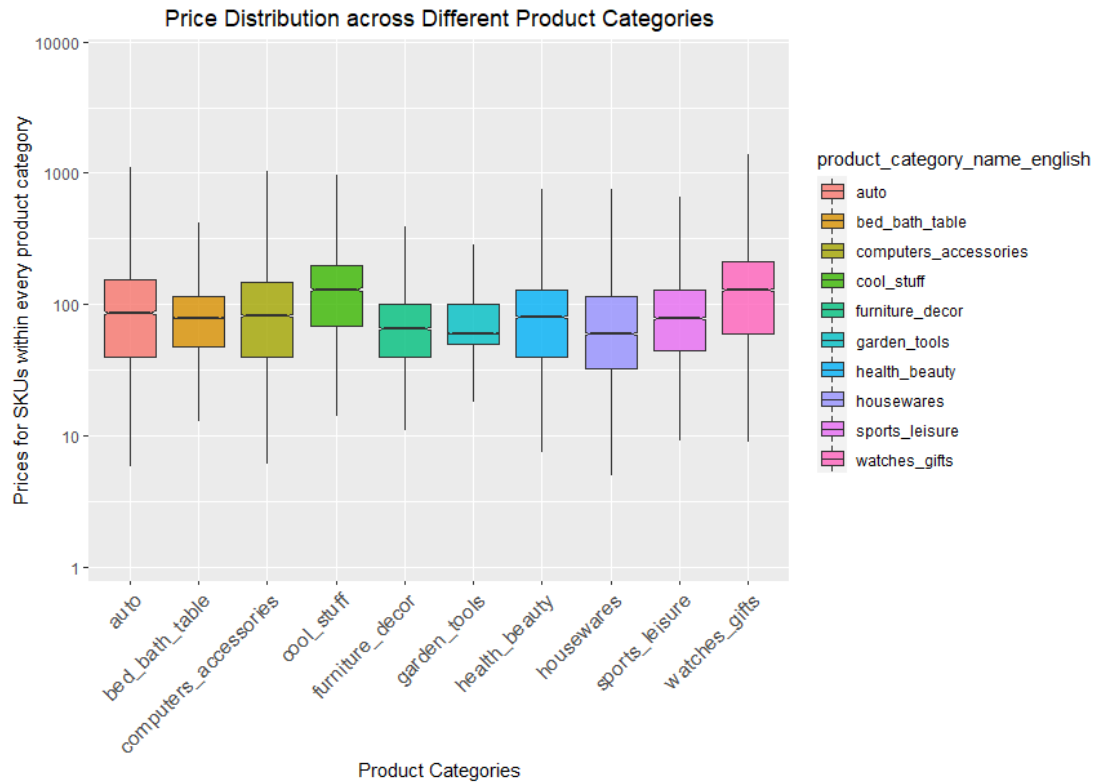


Figure 16. Price Distribution across Different Product Categories without Outliers

Furthermore, the Figure 14, facet charts illustrate Gross Merchandise Volume (GMV) across the top 10 product categories sold by Olist. Among ten facet charts, we can have a better understanding of the sales trend of the top 10 product categories. Five product categories are showing an increasing trend continuously, including auto, bed/bath/table, furniture/decorations, health/beauty products, housewares. Olist should consider putting more effort to search for more suppliers and brands to provide more products for customers.

Among these five product categories, health and beauty products developed rapidly which can show a market trend of the E-commerce industry. We propose Olist should invest more money to launch more events and activities to attract more customers during the celebration day of Brazil. As a consultancy, we also suggest Olist can find and cooperate with more clients to help launch more healthcare and beauty products from different brands. Due to Olist's relatively low reputation compared with other popular E-commerce platforms, Olist should promote products and attract more consumers from other social media platforms.

For computer accessories, sports/leisure products, and gifts, these three categories had a declining trend. Olist should concentrate more on product quality and product abundance. Therefore, Olist

should build connections with more sellers, especially for high-quality brand companies, to raise awareness for Olist platform.

Furthermore, Figure 15 and Figure 16 illustrate the price for the top 10 products. There is little differences between the boxplot with outliers and without outliers, which means the outliers have little influence on the result. There is little difference in the prices of these 10 products, which shows the per capita consumption level of Brazilians. There is not much difference in the money they spend on this daily consumer product. According to a report by Nielsen, a Brazilian consulting and research organization, between 2016 and 2017, the average income of Brazilian households increased by 11% to 3460 reais, while at the same time, the average household expenditure only increased by 1% to 3148 reais. This is the first time in the past three years that the increase in average household income in Brazil has exceeded the increase in expenditure, and it also means that Brazilians are becoming more and more rational in their consumption.

Brazil is located in the tropics. The hot and humid climate makes Brazilians very rich and frequent outdoor sports. Activities such as mountaineering, swimming, and surfing continue to drive the sales and development of related products. Brazilian consumers like to buy products such as clothing, accessories, sports, shoes and bags, beauty, home appliances, electronic products, online games, toys, etc. They prefer style elements such as bright colors, trendy personality, big-name exaggeration, and distinctiveness, and pursue products In terms of texture and clothing, it is especially the pursuit of tight-fitting and body-shaping effects.

Products Performance

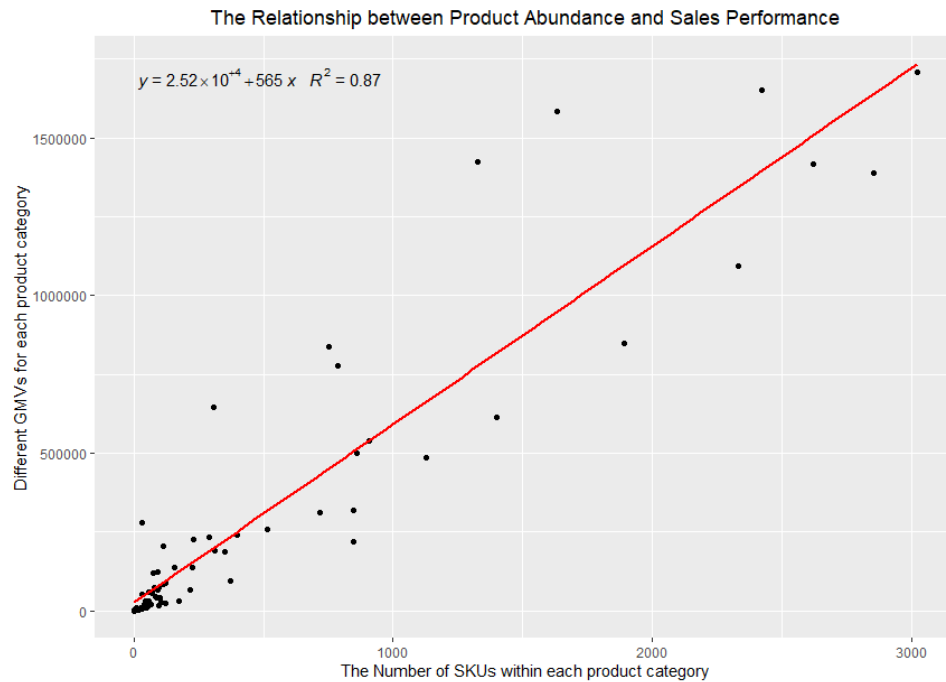


Figure 17. The Relationship Between Product Abundance and Sales Performance

The Figure 17 is a linear regression of y (GMV for each product category) on x (The number of SKUs within each product category) without outliers. The SKUs – known as a stock-keeping unit number – are essentially a string of numbers and letters that represent each product offered by Olist platform. Each point of the figure stands for a product category provided by Olist, representing the number of SKUs within each product category and the GMV for the corresponding product category.

To explore the relationship between product abundance for each category and corresponding sales performance, we drew a fitted line to analyze the effect of SKUs number within a product category on sales performance. From the formula, it can be concluded that the GMV will increase by 565 units when SKU number increase by 1.

```

Call:
lm(formula = sales_sum_each_cate ~ num_of_products, data = products_each_cate)

Residuals:
    Min       1Q   Median       3Q      Max
-286137  -42684  -25984   -2070   650802

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   25177.53    23113.93   1.089   0.28
num_of_products    565.44      26.81  21.088 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 165700 on 69 degrees of freedom
Multiple R-squared:  0.8657,    Adjusted R-squared:  0.8637
F-statistic: 444.7 on 1 and 69 DF,  p-value: < 2.2e-16

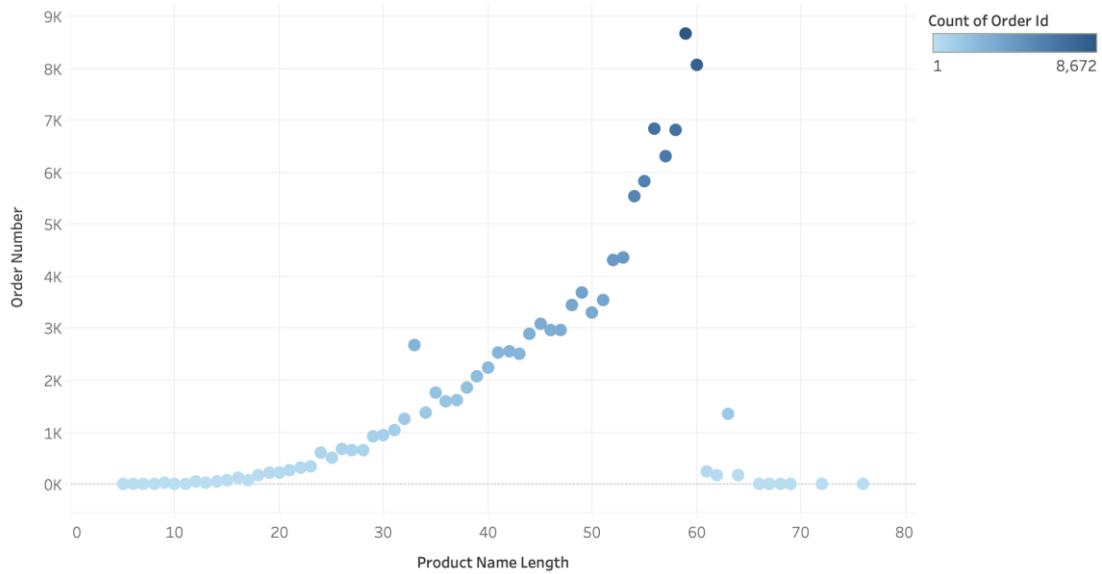
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Figure 18. The Result of Linear Regression Model

To test the significance of the above linear regression model, we summarized the result of our linear regression model. We can conclude that the coefficient of X (Number of SKUs within one product category) is significant at the 1% level. Also, the R squared is 0.8657 meaning that the X can explain about 87% of y (GMV within each product category). From our single linear regression model, our consultancy recommends that Olist should enrich SKU numbers within each product category in order to boost sales for the whole platform. One method to enrich SKU numbers is to reach out to more sellers so that Olist can provide more products to the customers and have a better sales performance in the long term.

Products Description

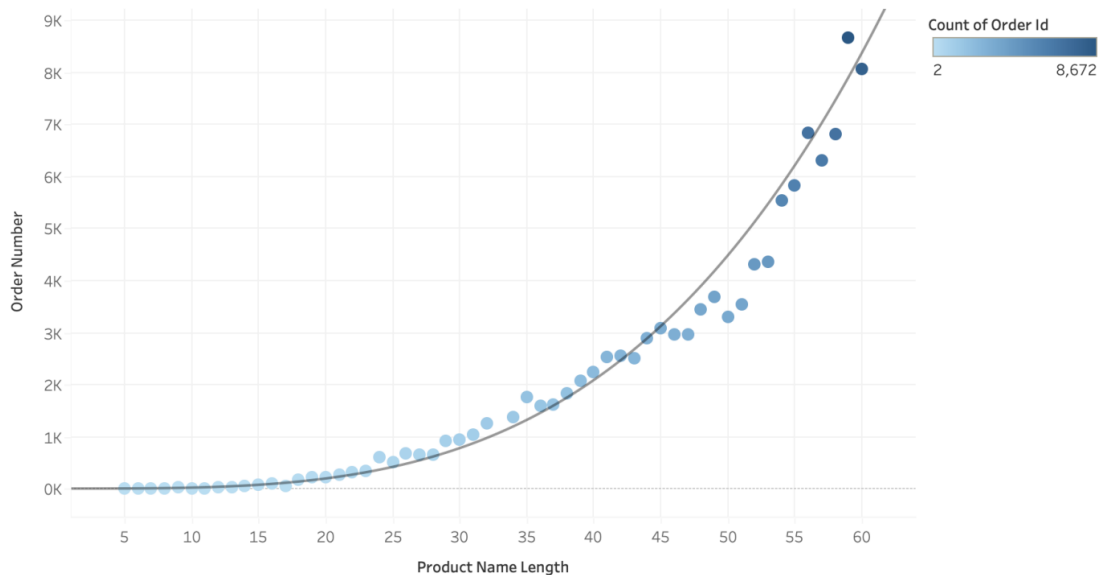
Order Number & Product Name Length



The plot of count of Order Id for Product Name Length. Color shows count of Order Id. The view is filtered on count of Order Id and Product Name Length. The count of Order Id filter ranges from 1 to 8,672. The Product Name Length filter ranges from 5 to 76.

Figure 19. Order Number & Product Name Length with Outliers

Order Number & Product Name Length



The plot of count of Order Id for Product Name Length. Color shows count of Order Id. The data is filtered on Product Name Length, which keeps 55 of 66 members. The view is filtered on count of Order Id and Product Name Length. The count of Order Id filter ranges from 1 to 8,672. The Product Name Length filter ranges from 5 to 76.

Figure 20. Order Number & Product Name Length without Outliers

From the Figure 19, we can see there are some outliers in the graph. The product name is too long.

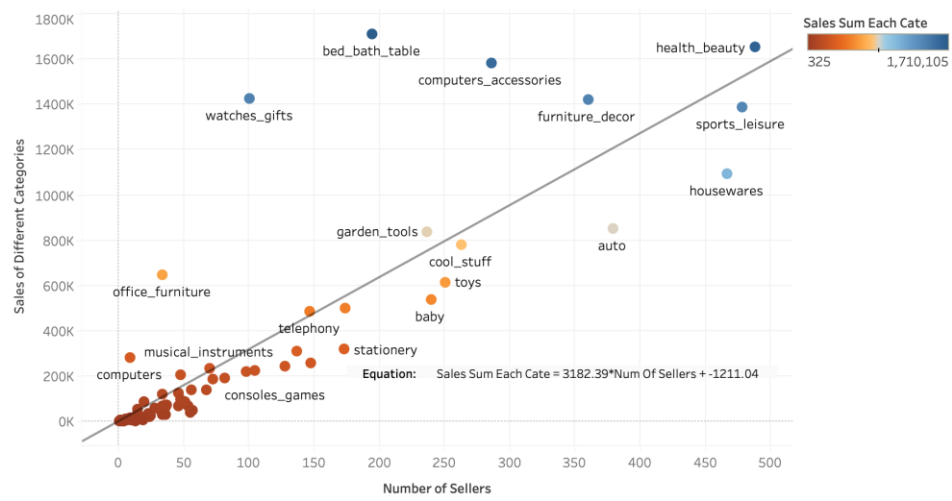
On the one hand, it may be because there are few businesses with too long name. On the other hand, it may be because the name is too long, which will also cause consumers to be unable to clearly distinguish the product. From the Figure 20, it is clear that the longer the names of products, the higher the order number. It illustrates the importance of product name length on consumers.

From the buyer's shopping experience, Olist's products are too large and category navigation is limited, mainly relying on search. For the same product, everyone's calling habits are different. In order to ensure that people with different habits can search for the product, You need enough headline length. From the perspective of the seller's experience, it is also because the products are too large and require enough placements, and search is the most important source of traffic, and a sufficiently long title is also required. If it is just for the seller to optimize the search and get more display opportunities, then the buyer does not search for so many words, and the title is too long to be a waste, so in general, it is still the buyer's existing demand. Olist is mainly for the convenience of the buyer. Sellers need to cater to buyers' needs.

Product names need practicality, not art, and do not need aesthetics. The role of the name is to help customers find the goods they need in the first time. For example, there is only a hoodie in your product name, but the customer is searching for a sweater. Although the two are the same thing, the result is that you can't find your product at all. For example, if your product name is a polo shirt, but the customer searches for a striped polo shirt, then the product with a striped keyword will appear first in the search results. Your product may be ranked after dozens of pages, and no one will browse it.

Sellers Impact on Products

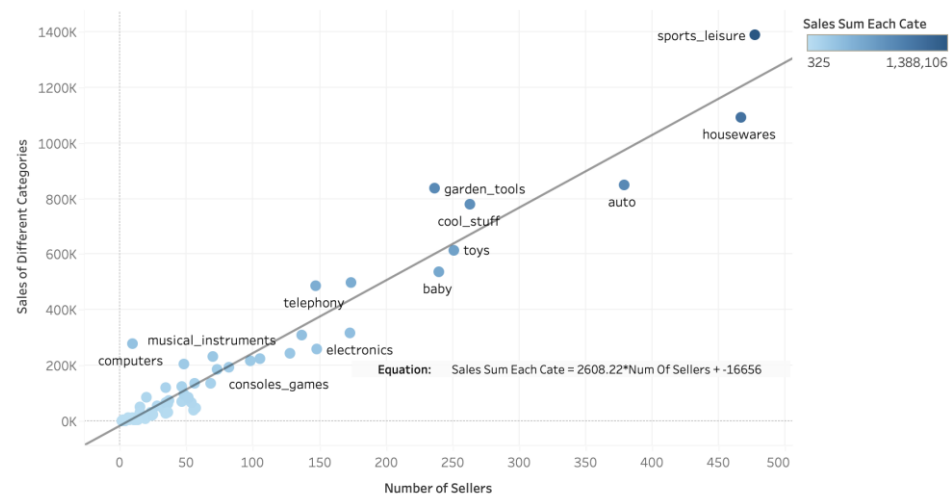
Sales of Different Categories & Number of Sellers



The plot of sum of Sales Sum Each Cate for Num Of Sellers. Color shows sum of Sales Sum Each Cate. The marks are labeled by Product Category Name English. The view is filtered on sum of Sales Sum Each Cate, which ranges from 325 to 1,710,105.

Figure 21. Sales of Different Categories and Number of Sellers with Outliers

Sales of Different Categories & Number of Sellers



The plot of sum of Sales Sum Each Cate for Num Of Sellers. Color shows sum of Sales Sum Each Cate. The marks are labeled by Product Category Name English. The view is filtered on sum of Sales Sum Each Cate and Exclusions (Num Of Sellers, Product Category Name English). The sum of Sales Sum Each Cate filter ranges from 325 to 1,710,105. The Exclusions (Num Of Sellers, Product Category Name English) filter keeps 65 members.

Figure 22. Sales of Different Categories and Number of Sellers without Outliers

P-value: < 0.0001				
Equation: Sales Sum Each Cate = 2608.22*Num Of Sellers + -16656				
Coefficients				
Term	Value	StdErr	t-value	p-value
Num Of Sellers	2608.22	83.0416	31.4086	< 0.0001
intercept	-16656	10599	-1.57147	0.121083

Figure 23. The Result of Linear Regression Model

Focus on Figure 21 and Figure 23, we can see the linear regression model, which indicates that how the change of the number of sellers in different product categories affects the sales of each category. This linear regression line shows that with the increase of the number of sellers in each product category, the number of sales also increases, which aligns with our econometrics expected sign. And both statistically significant and economically significant.

At the same time, we can see that most of the dots accord with the line, but some of them, the categories like watches_gift, bed_bath_table, computer accessories, right on the top of the model, without many sellers, but still got great sales and way higher than the other category within the same range of the number of sellers. We can assume that these kinds of the category are good so whether many businesses are selling them, they are all attractive enough to get more concentration of customers.

Otherwise, we estimate that in this category, some of the sellers are big companies with a really good reputation so the customers would trust them. Buyers like to choose these firms when it comes to the needs of these products like software, furniture, and watches.

We can conclude that the selling scale is really important for sales since the left bottom gathers a lot of categories with few sellers and certainly with bad sales. However, along with the regression line, the sales volume obviously increase, especially the classes on the top right corner. In conclusion, we need to bring more good quality sellers to help boost the sales. For the categories already in a good sale situation, it is significant to keep good customer relations with those big companies who attribute the most orders.

Sales

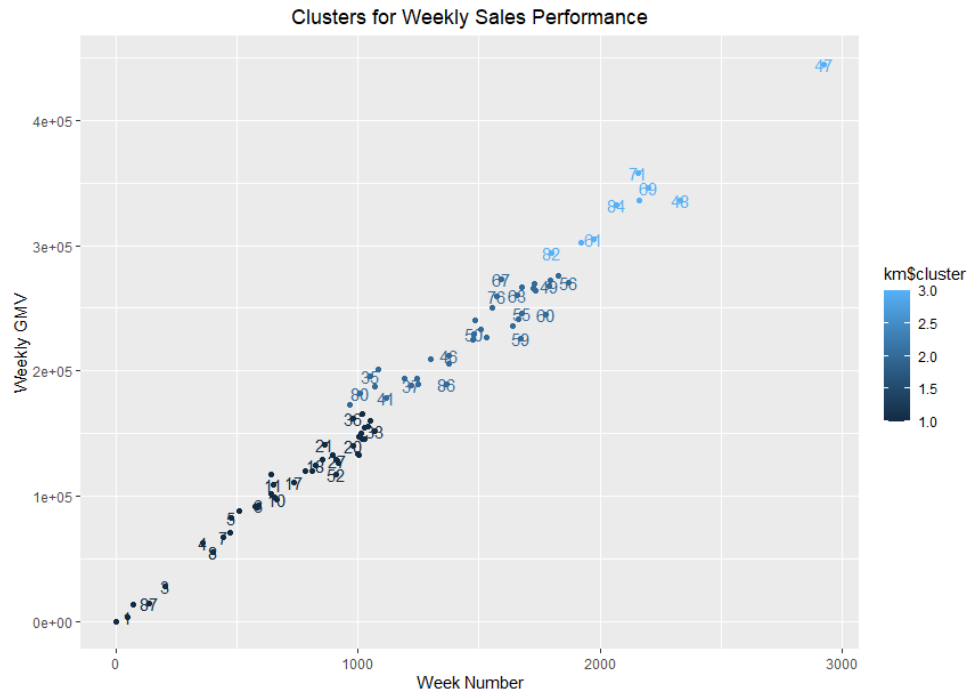


Figure 24. Cluster for Weekly Sales Performance

The Figure 24 draws three clusters for sales performance across various weeks using K-means methods. The x-axis stands for weekly sales volume from January 2017 to August 2018, the y axis stands for the weekly Gross Merchandise Volume (GMV) for the corresponding week. Each point of the figure represents weekly sales performance for a specific week, which is labeled with the ordinal number of the corresponding week. With the help of K-means, we distinguish the points into three parts based on sales performance. Firstly, the dark blue weeks are those with poor sales performance. From the label beside the points, it can be seen that the ordinal number of the weeks with poor sales performance are mainly smaller than 20. The phenomenon shows that Olist did not have excellent performance at the beginning 5 months of 2017.

Additionally, the blue points in the middle are the weeks with intermediate sales performance. The ordinal numbers which perform intermediately are between 35th to 80th week which shows the increase of sales during the second half of 2017 and 2018 compared with sales within the first half of 2017. Better sales performance represents an expanding trend in the second half of 2017 and the whole year of 2018.

Last but not least, the light blue points represent the week with outstanding sales performance. For those seven weeks (47th, 48th, 61st, 69th, 71st, 82nd, 84th week), the Olist platform had excellent Sales Volume and GMV. During these weeks, there are some celebration festivals during which

customers were attracted by some marketing activities launched by Olist. Our consultancy suggests that Olist should pay more attention to specific festivals within a year in the future years by launching some marketing campaigns and activities to attract more customers.

Additional Data Sources

Population

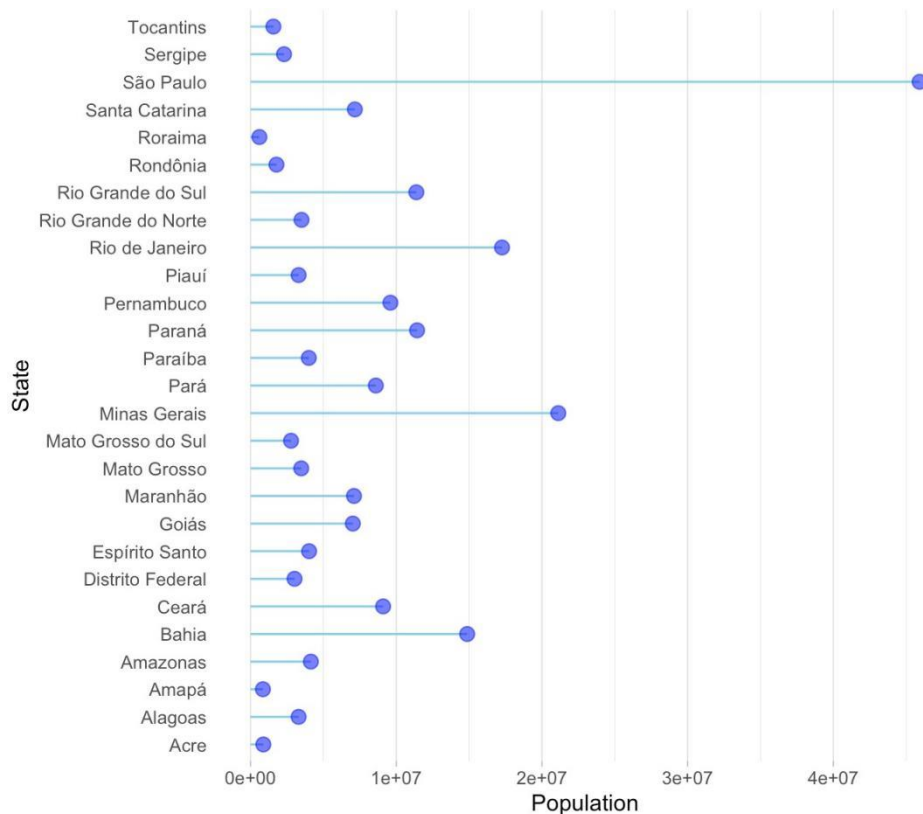


Figure 25. Population of Brazil

Brazilians are the general term for Brazilian residents in South America, mainly living in Latin America. There are mainly Indians, blacks and whites mainly of European descent, as well as all kinds of mixed races after the three intermarried. Due to historical reasons, the ethnic composition of the Brazilian population is very complicated. The Atlantic coast is densely populated and the inland areas are relatively sparse. The ethnic and cultural differences are significant. According to 2010 data, about 47.3% of the Brazilian population are white, 43.1% are mixed races, 7.6% are blacks, 2.1% are Asians, and the rest are Indians and other yellow races.

In the picture above, you can see that the number of people living in São Paulo is very large. Brazil's cities and population are mainly distributed along the southeast coast. The population distribution of Brazil varies greatly from region to region. Few people in the north, central and west. Ninety percent of the people live in the southeast coastal zone, of which the southeast is particularly densely populated, and large cities are also concentrated in this area. This area has convenient maritime transportation. European colonists and the blacks they trafficked from Africa

first arrived in this area to grow sugar cane, coffee and mine minerals. In addition, the population has increased greatly due to intermarriage. Other places are forest wasteland during the period when only a few Indians are scattered, and many places are still no man's land.

The terrain of Brazil is mainly divided into two parts, one part is the Brazilian plateau above 500 meters above sea level, distributed in the southern part of Brazil, and the other part is the plain below 200 meters above sea level, mainly distributed in the northern Amazon basin and the western part of the Amazon plain. The largest plain in the world has a tropical climate in most areas, and a subtropical climate in parts of the south. The average annual temperature in the Amazon Plain is 25-28 degrees, and the average annual temperature in the southern region is 16-19 degrees. Due to temperature, the population of Brazil is mainly distributed on the Brazilian plateau rather than the plains.

Approximately 37% of Brazil's self-reliant population are engaged in agriculture; the residents of southern and western regions are mainly animal husbandry; some people are engaged in forestry and fishery. The industry is relatively developed, and the concentration of production is high.

General Portuguese has absorbed a lot of Indian and African vocabulary to form Brazilian Portuguese. Believe in Catholicism. There are many churches, churches and monasteries, which have a great influence on politics and social life. Most festivals originated from Catholic religious festivals. The Brazilian culture is mainly produced on the basis of the combination of European culture, Indian culture and African culture. Folk creations are rich and colorful. Brazilians love music, can sing and dance, and are popular in collective dance. Every year in February and March, the city will hold a three-day and three-night carnival, men, women and children dressed in gorgeous festive costumes, allure, all night to dance popular samba, performances, disguise parade, Brazil The famous carnival body painting. Rio de Janeiro has the largest carnival. Blacks and Indians also retain certain traditional ethnic programs. Due to the influence of these economic environments and cultures, in the analysis process of Brazilian e-commerce, we can also see changes in sales driven by purchases of goods and festivals.

Consumption Level

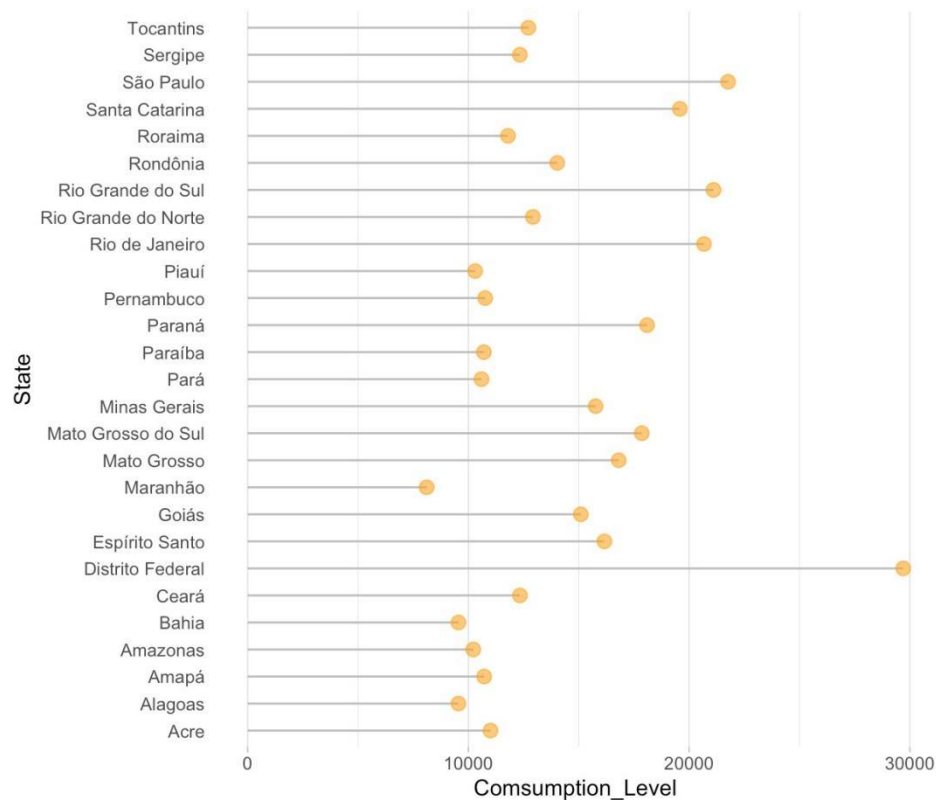


Figure 26. Consumption Level of Brazil

According to a report by Nielsen, a Brazilian consulting and research organization, between 2016 and 2017, the average income of Brazilian households increased by 11% to 3460 reais, while at the same time, the average household expenditure only increased by 1% to 3148 reais. This is the first time in the past three years that the increase in average household income in Brazil has exceeded the increase in expenditure, and it also means that Brazilians are becoming more and more rational in their consumption.

"Consumers in Brazil have now learned to purchase in a planned way, save money by managing expenditures and buy cheap goods through other channels, and are more willing to buy consumer goods for daily necessities."

With a population of about 200 million, Brazil is currently the ninth-largest e-commerce retail market in the world, the only Portuguese-speaking country and the largest country in South America, and the only country in Latin America that ranks among the top 10 retail e-commerce markets in the world. According to the latest report released by Brazil's online consumer behavior

research company E-Bit, Brazilian domestic online purchases reached 41.3 billion reais (11.62 billion U.S. dollars) in 2015, a year-on-year increase of 15.3%; average online purchases increased by 12% compared to 2014. Reached 388 reais (109.2 US dollars); the number of online shoppers increased to 39.1 million, an increase of 3% over 2014; the total number of orders also increased by 3%, reaching 106 million.

Brazil's e-commerce revenue in 2016 was 16.579 billion U.S. dollars (approximately 111.719 billion yuan); and by 2021, the annual growth rate of Brazil's e-commerce revenue will reach 11.9%, and the market transaction volume will reach 29.06 billion U.S. dollars (about 11,719 million yuan). 1958.49 in RMB); in addition, Brazil's e-commerce's most popular product is fashion, with a market transaction volume of US\$5.618 billion (approximately 37.86 billion RMB) in 2016; and Brazil's e-commerce user penetration rate in 2016 Around 38.2%, it is expected to surge to 55.7% in 2021.

Relationship between Consumption Level and Payment in Olist

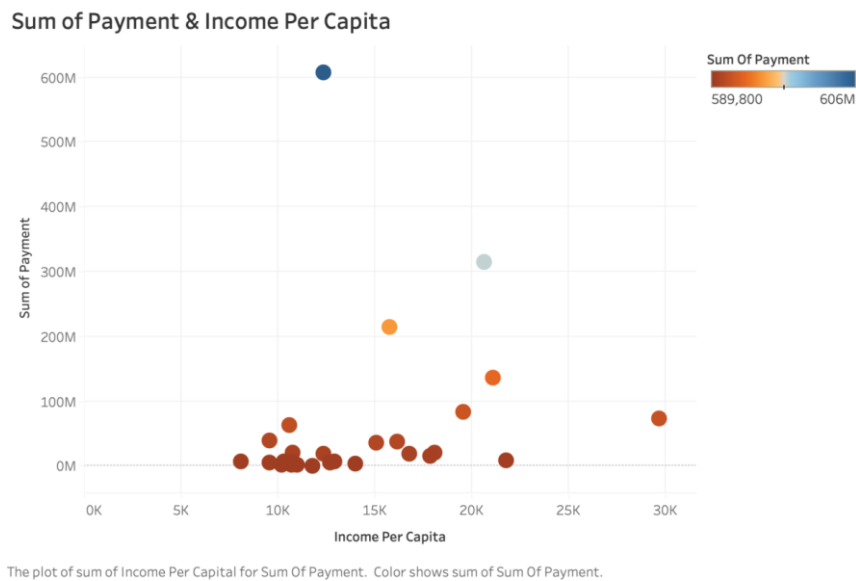


Figure 27. Sum of Payment & Income Per Capita with Outliers

We can see that most states' per capita income is concentrated in the range of 10k to 20k, and with this range of per capita income, the total payments are very low, about close to 0. But there's an outlier which is the state SP, with over 600 payments. That's wired because SP is also at this interval, why would its payment be such a high number. We consider it in two possible situations.

First, maybe the per capita income is low, but this region has a very high population density. Therefore, per capita income multiplies a high population can get high payment. This is reasonable because we conclude before that SP does have the most population in Brazil, which is over ten million. Therefore, we consider the factor of population difference among different states.

Second, the high payment of single orders from high-income groups probably causes this result. There are too many people's earnings that are at a low level depress the average income level. We can see this from the order payment value distribution. The highest price products or services cannot be afforded by people who earn only 10k-20k per month, and they're all one-time payments, not payment by installments. Since most of them use credit cards to pay the order, and they still need to pay for other living expenses, there's a definite limit for their single payment value. Besides, we can see from the arrange of product category rank by payment, the first category is fixed telephone, which should be services ordered by a company. In this perspective, we can assume that there are several companies located in SP that also make orders from Olist, and they purchase long-term services like hardware such as fixed telephone or software computers accessories for work in the office.

From this analysis, we can get a new view of our clients. That is except for users of citizens, it is important to build a long-run relationship with firms. They need a convenient way to order some long-term and steady services, which is a business chance we need to grasp.

Summary

Customers

Through the analysis of users with RFM model, we can get a result of customers' value category. We lost 24.43% of users, and about 1/4 of users are losing. The status of users is very unsteady. It's a hint for paying more attention to maintaining users.

With the timeline, we found that in 2017, user and transaction are both growing faster, but in 2018, towards a good cardinal number of customers, the increasing rate becomes low. We consider that as two potential factors.

First, users in this area have reached saturation point. What needs to be adjusted is the user structure. We can find that the users amount basically equal in 2017 and 2018, but this kind of non-change comes from the balance of acquisition of new users and the loss of original users. This is an unhealthy condition which states that the user experience is not good. Therefore, we need to focus on the existing users and products themselves. For consumers and sellers, the company should be aware of their needs, leading by demand orientation.

When we are looking at the product value and the average transaction amount, we should have an answer to this query. Through calculate the average amount spent per purchase, we can see that we keep few high-consumption groups. Most of our customers are low-income individuals and they won't have the capacity to afford those expensive goods. Even in the capital, we can't find a stable group of users who used to pay for higher-priced products. Whereas the low-price commodity always has bad quality, and then this could have a negative influence on the user experience of evaluation of product and the impression of the platform. So most people became 'disposable customers'. This requires the department to control product quality and screen merchants strictly to ensure the product quality and try to encourage higher consumption.

Certainly, if we look at distributions of geographic location, customers who lived in a state like CE, MT, TO AL, AP always gave more than 80% of positive feedback, which indicates the conclusion we got above that the purchasing capacity comes with a salary, income or the per capacity disposable income affect the user feedback. People who earn more could buy more quality products and give more praise.

Second, it is possible that other competitors maybe taking the remaining market away. So Olist cannot find more users. But according to the situation we got, there are no other similar platform

in Brazil, so we tend to hold that the key point is still in the operation inside the company. From this part, we might need to calculate conversion rate of every link in the next report so as to analyze which part has the problem. On the other hand, we will do some deeper analyzing to see the expansion trends of user, sales and transaction supporting our result.

Third, by analyzing the payment Value and Order volume in one day, we found that the payment value reaches the maximum at 2:00 p.m. Payment value reaches the minimum at 5:00 a.m. and has a rapid growth after 6 a.m. It goes down fast after 10 p.m. The order volume has the same trend as the payment value, but it reaches the maximum at 4:00 p.m. The minimum payment value and order volume are obviously because of rest time. Customers in Brazil prefer to start shopping on Olist after 10 a.m. In the daytime, the payment value and order volume keep at a high level. Then it goes down after dusk. To help Olist extend the purchase period in a day, we suggest Olist have a sales promotion in the evening. For example, the order after 11 p.m. can get a 5% refund; the order after 11 p.m. can get extra gifts. Those selling methods can stimulate customers to spend more time on Olist.

Payment value and order volume in one week show that: the payment value is higher on workdays and is lower on weekends. It reaches the maximum on Tuesday. The order volume is similar to the payment value. Cellist customers prefer to shop in the mid of the week. They purchase less on Monday and Sunday. According to the fact that Brazilian have a vacation on Saturday and Sunday, they spend more time on other things rather than shopping on Olist. To help Olist increase payment value on Saturday and Sunday, we suggest Olist have a sales promotion on the weekend. It can help then to attract customers.

Transaction Amount and Order Quantity

When we look at the transaction amount and order quantity in 2017, we can know that the peak shows in November, and concrete to date, it's Nov.24 which makes the whole of November got the highest amount. We can see that the most of transaction amount and order quantity come from Sao Paulo in SP. And from the previous analysis, we know that sellers or merchants mainly stay in SP, PR, and MG, for almost 80% of all, and SP takes first place in it with 64%. Sao Paulo has the greatest proportion in transaction amount, containing over 3000000 BRL.

Compare transaction amount with time in 2017 and 2018, the increase of transaction amount is intensive in SP. This proves that we did a good job in publicity in SP, and the shopping festival did active consumers enthusiasm of purchase.

Payment Value Distribution

From the payment value distribution of states. MG, RJ, BA, PR, SC, RS, in terms of high payment value are all radiated by SP, and the position provides quicker access to ports, which benefits the development. We can speculate that people in more developed states have higher incomes, and they pay more on products, so the order payment value can be positively associated with the development level. These five states surrounding Sao Paulo within the southeast coast have a great advantage in prosperous degree. Actually, in terms of this natural advantage, I think the next priority in our development strategy should be paying more attention to north-eastern Brazil and other areas around Brazil in South America.

In 2017, the gross merchandise volume had been increasing steadily. Only there was a boom in November, Brazil is a country with a majority of immigrant people. 88% of Brazilian people believe in Catholicism. So we can assume that several festivals such as Thanksgiving, Halloween, Christmas pushed the explosive growth of GMV. Besides, shopping festivals like Black Friday also contributed to this increase.

From this angle, we find that the external shopping culture has a great effect on Brazilian people. Though this kind of influence brings a lot of sales and margins for List, it's very brief and totally depends on external factors, which results in a horrible situation that if the system stability shatters in the North American market, Olist will be impacted sharply. Therefore, it is significant for Olist to build its own special shopping culture to prevent itself from being hit. There is a lot successful case like 'double eleven' shopping festival in Taobao and Tmall and 'Black Friday'.

Logistics Situation

Olist may also face changes in corporate organization management, production operation management, and product marketing management in the e-commerce era. Logistics as a new source of profits for enterprises, its management innovation should rely on the network and e-commerce, through intensive modern management, to achieve zero inventory and low inventory of merchants, reduce product operation cycle, in order to meet the needs of e-commerce enterprises.

First of all, the development of the logistics industry is the guarantee for the development of e-commerce. From the perspective of enterprises, an efficient logistics system can bring less logistics costs and higher service levels; from the perspective of customers, the final delivery of most product entities must be completed through the logistics system. If the logistics operation

efficiency is low, then the many advantages of e-commerce cannot be reflected. Without the support of the logistics industry, e-commerce can only become a castle in the sky and cannot function.

Secondly, the development of the logistics industry has greatly promoted e-commerce. Logistics can improve customer satisfaction and loyalty, and can expand the business scope of an enterprise and bring new market opportunities. For example, for some remote areas, because the volume is not large and the delivery is difficult, the general express company is unwilling to do it, but Olist can solve the distribution problem in some remote areas by subsidizing the express company, which not only expands its business scope, but also increases The revenue of the express delivery company has been reduced, thus achieving a win-win situation.

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