Business analysis on Brazilian ecommerce platform - Olist

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Abstract

Olist is a leading Brazilian e-commerce platform that offers a marketplace to connect small and medium-sized businesses to a large marketplace. It was established in 2015. It currently has about 25,000 merchants on its platform. There are more than 96K customers. Currently, Olist has raised Series D round $80 million from Goldman Sachs and SoftBank.

For the business performance, the total sales amount is $16.01M from 2016 Q3 to 2018 Q3 contributed by 99.44K customers. The growth of sales volume is 20% from 2017 to 2018. Sales orders drop from 2018 Q1 to 2018 Q2, and a severe sales drop in the 2018 Q3. The report will further analyse the reason that led to this change. The forecast sales trend on the sales amount will be steady growth in 2019.

Credit cards and Boleto Bancario count more than 76% and 20% of payment methods respectively. Boleto Bancario is also known as Boleto, the only payment method available for the 35% of Brazilian shoppers who do not have a bank account. It is a popular payment method in Brazil. The report will focus on the current payment method to explore the future payment trend.

Nearly 50 subcategories covering 33K product types were sold. The top 3 fastest-growing products are small home appliances (portateis), diapers and hygiene(fraidas) and movies(cine). The top 3 decreased products are security and services(seguros), cds and tablets.

In terms of the customers' distribution, São Paulo (SP) covers 30% of customers, Rio de Janerio (RJ), Minas Gerais (MG) covers 10% customers respectively. São Paulo (SP) and Paraná) maintain a steady and higher growth payment value each year than Rio de Janeiro (RJ), Minas Gerais (MG) and Rio Grande do Sul (RS).

The average delivery days per order are 12.5 days, which is faster than the platform estimated delivery days 24.5 days. The average delivery time of small size products and FMCGs products are more rapid than large size products.

After analysing the review scores(customer satisfaction rating), the average score is 4.07/5, which shows positive satisfaction with Olist's services.

The report covers product categories, sales performance, customers base, logistics, and geographic location to analyse how to improve and leverage the competitiveness to deliver a better customer experience and expand the business.

Methodology

Implementation of Database

We have decided to use SQLite3 as a database client to implement our local database as it is very suitable for a small-scale project and easy to use. A member failed to make a connection at the first time through ODBC Data Source. After some research, we have all successfully connected to Power BI by using connection string directly.

The data source files are provided in csv format and have loaded into a SQLite database with .import method by using SQLite command line tool which was very convenient and quick to make our database right off the bat.
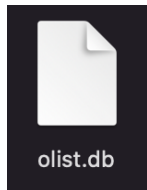

Database Management System: SQLite3
Connection Method: ODBC Driver
Connection String: Driver={SQLite3 ODBC Driver};Database=./.../olist.db

The local database:

Data Analysis

Microsoft Power BI, a powerful and well-known data analytic software is used for loading and transforming data from the local database.
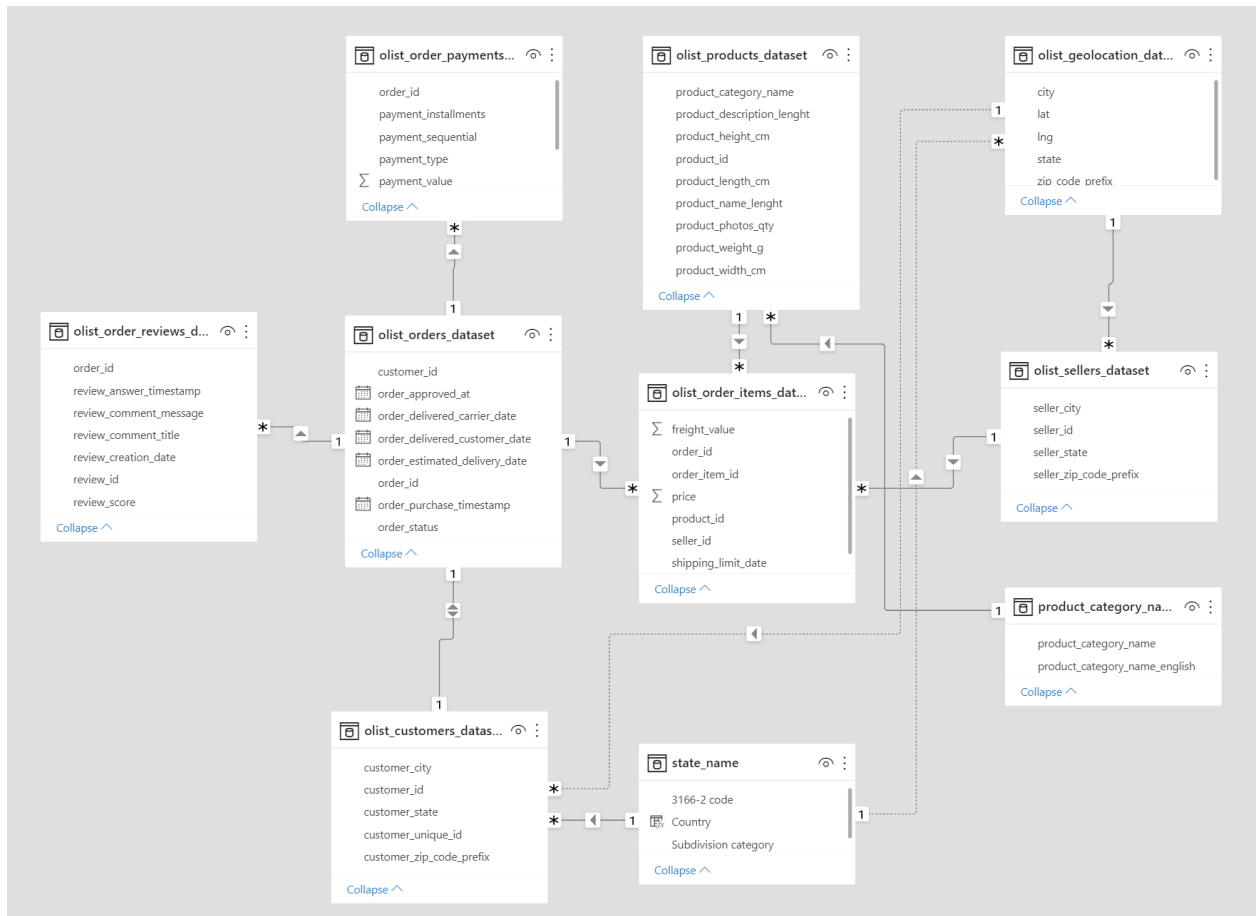

Analytic Software: Microsoft Power BI Desktop

Database Schema

The below image shows the database schema design of Olist. The fact table is olist_orders_dataset and a couple of dimension tables are connected to it in a way of *many to one*. The additional table state_name is added for providing more information.
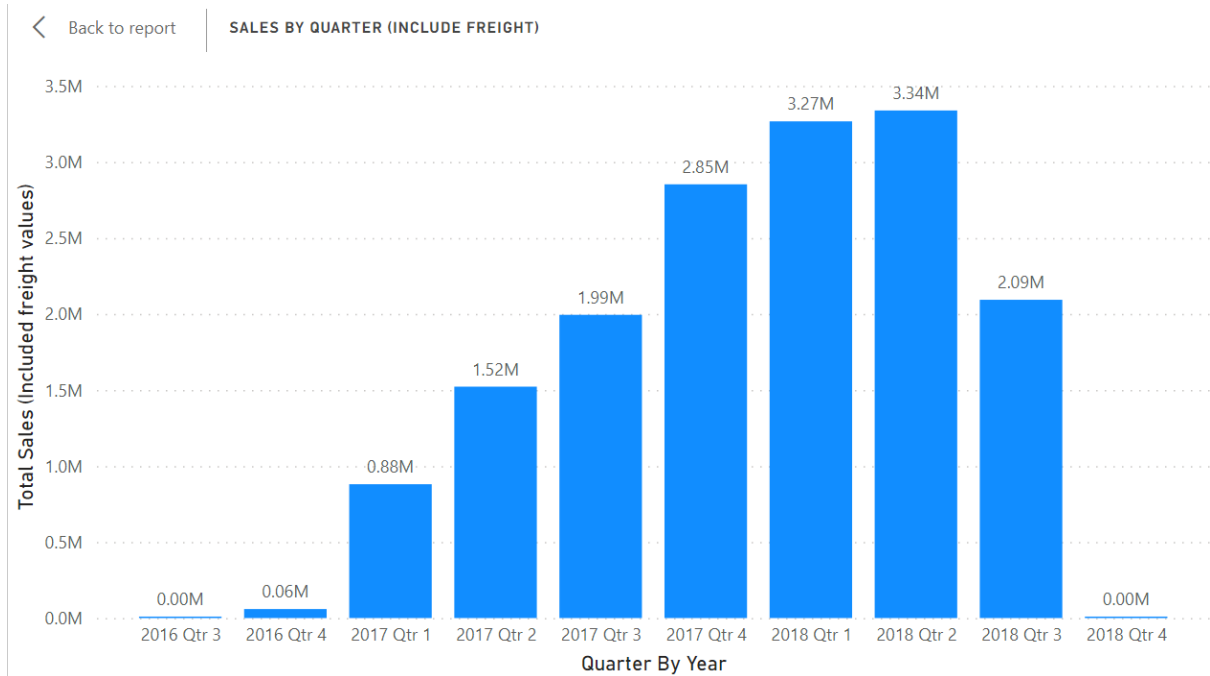
Analysis

Sales performance analysis
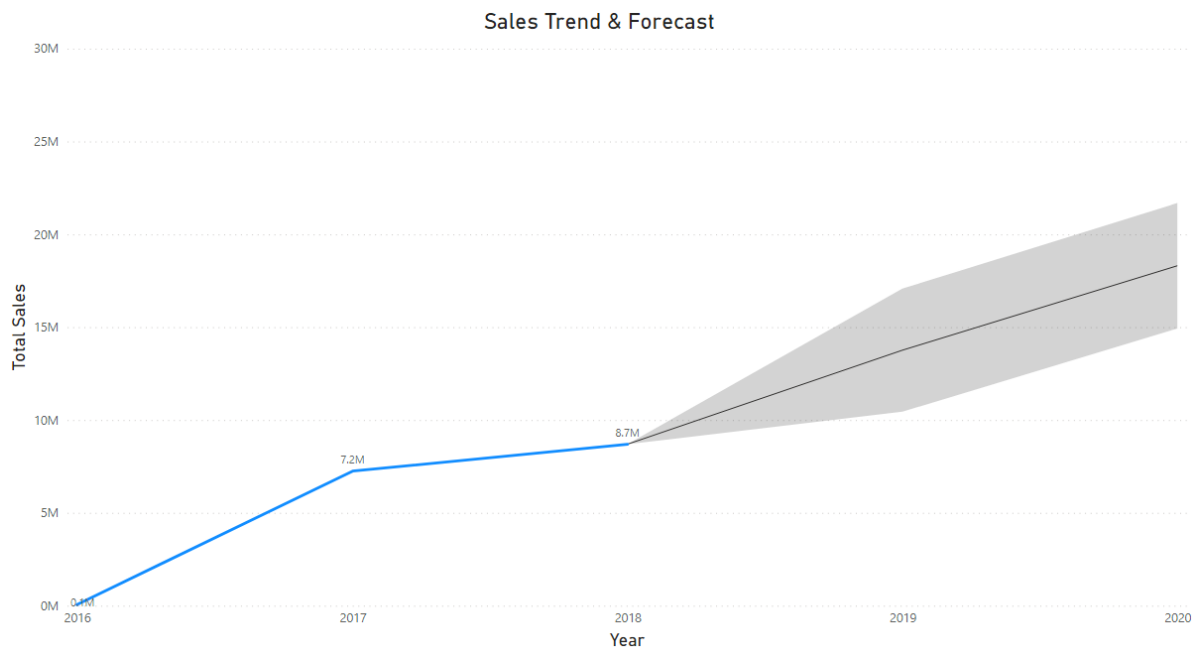

Figure 1.1 Sales By Quarter (Included freight value)
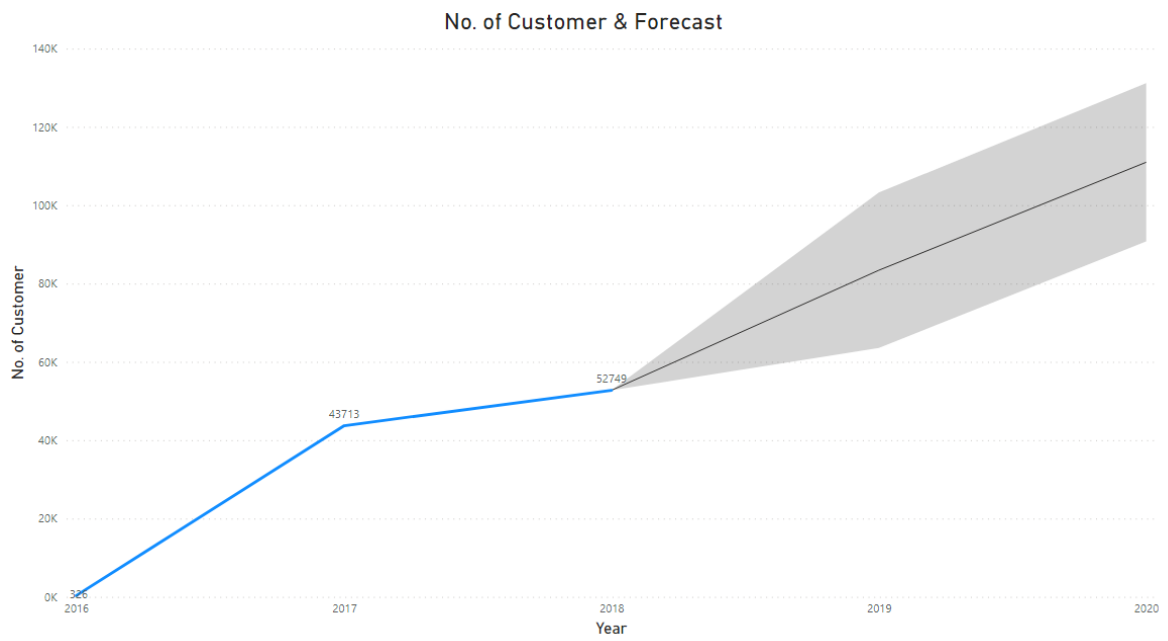

Figure 1.2
Sales Trend in 2016 – 2018

No. of Customer & Forecast

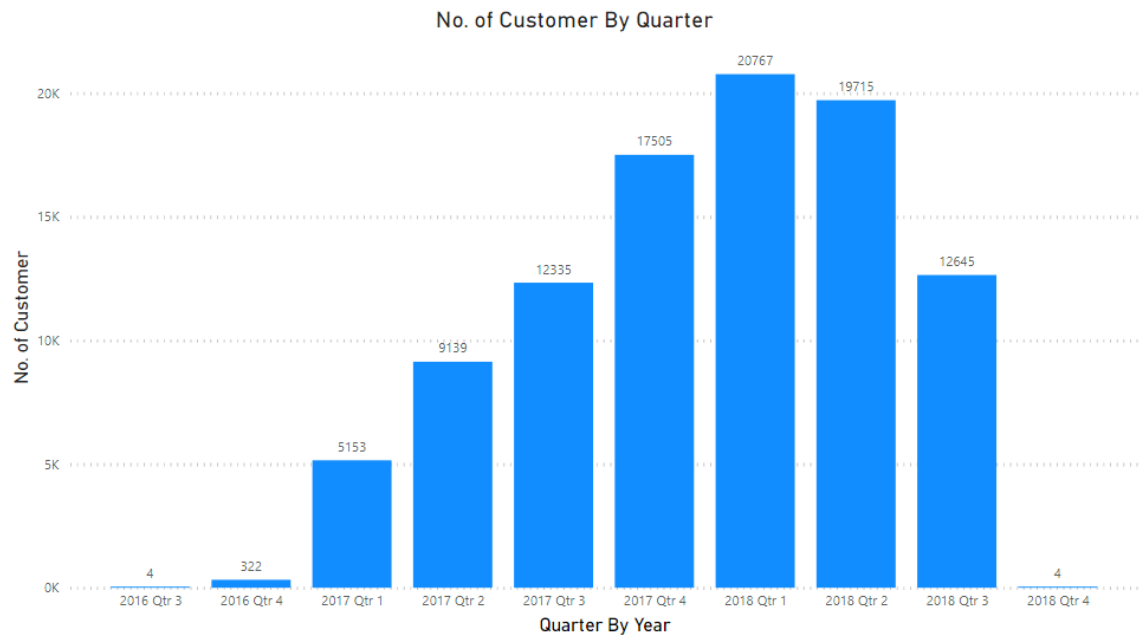Figure 1.3
No. of Customer in 2016 – 2018 & Forecast

Figure 1.4 No. of Customer By Quarter

Figure 1.5 No. of Orders By Quarter

In this section, we would like to find out how the business and sales have flourished over the period. As Olist started the business at the start of 2016, the sales were almost negligible.

It has been observed the sales amount and number of customers of Olist was significant rise from 2017 to 2018 for around 20%. Although it is forecasted there will be a steady increase sales trend in 2019, the sales amount, number of customers and orders was declined slightly in Q2 2018 and dropped sharply in Q3 2018. It is recommended that the company should conduct more promotion campaigns to continue make the made great progress in market penetration. Other than that, the yearly average order per customer is 1.03 means customers seldom ordered than twice. Olist should try to find out the reason and improve this ratio. It is vital because customer retention measures not only how successful a company is at acquiring new customers but also how successful they are at satisfying existing customers. It also increases ROI, boosts loyalty, and brings in new customers.
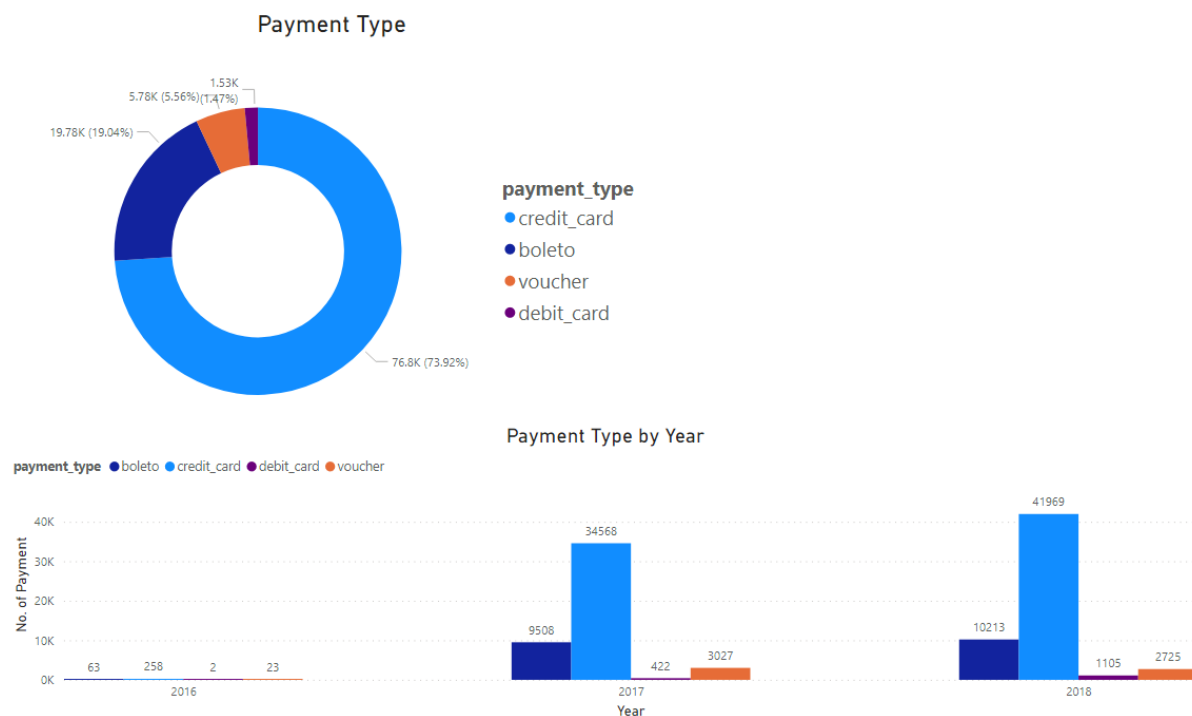
Payment methods analysis

Figure 2.1 Overall variety of payment type distribution

More than 70% of sales were paid by Credit Card which is the main payment method in the market. However, the payment of using Boleto has been slightly increased by 7% and a significant increase of using debit card has been founded. Extra cost might be occurred due to the surcharges by using different payment methods such as the rapidly increasing cost of VISA and Master (1.5%). Therefore, it is vital to control the administrative cost. As there are now more ways than ever to pay, a trend that will continue in the coming decades, merchants including Olist are suggested develop more ways to attract consumer by cooperating with different payment platform such as Boleto which is one of the most popular payment methods in Brazil.

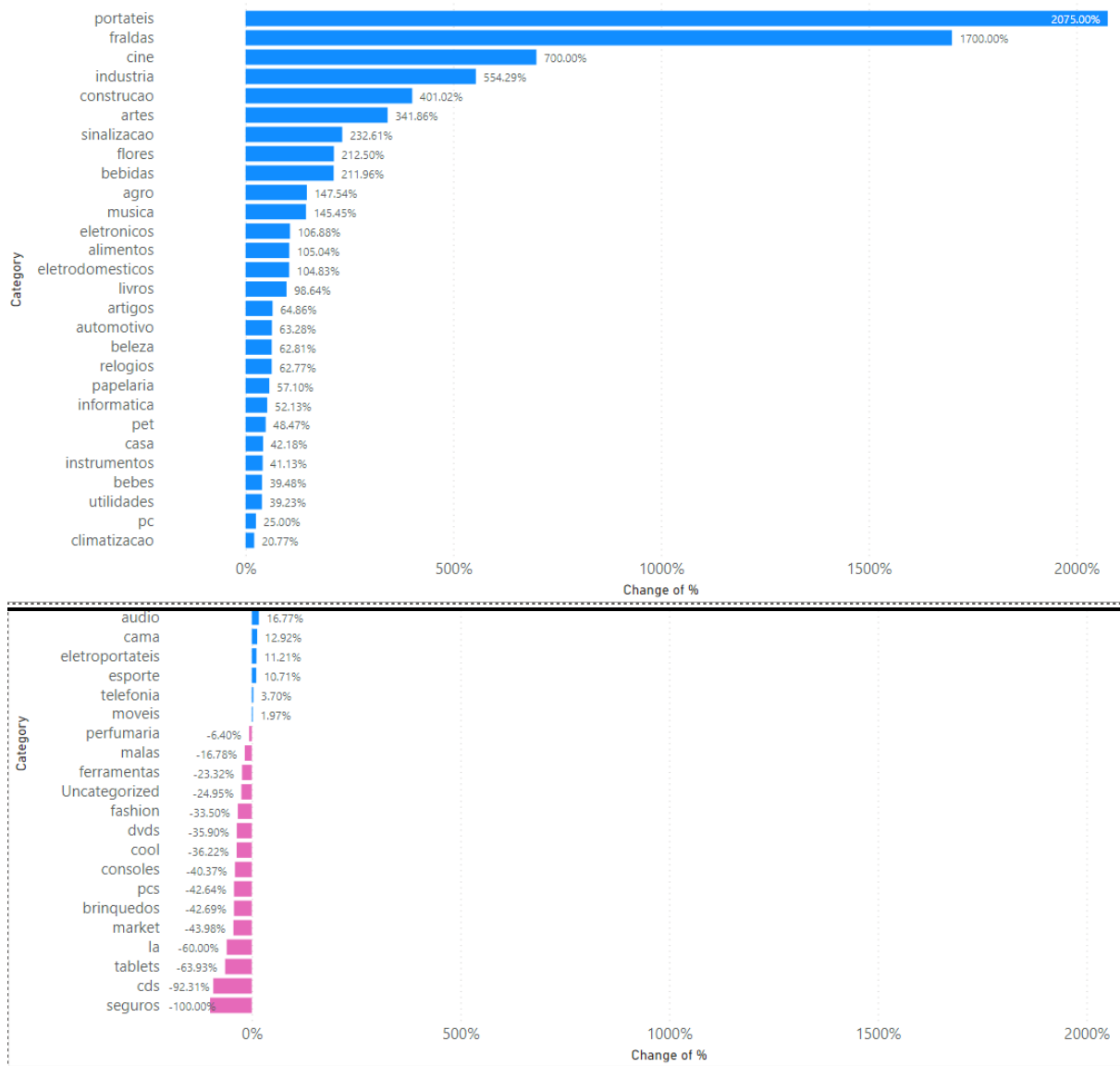Yearly Sales Change by Product Category in 2017 - 2018

Figure 2.2 Yearly Sales Change by Product Category in 2017 - 2018

Figure 2.2 indicates the top 5 popular categories are : movies, cama(bed), esporte(sport), beleza(beauty) & utilidades(utilities); and the least 5 are instrumentos(instruments), eletroportateis(household appliances), alimentos(food), climatizacao(air conditioning) & market. It is suggested to focus more promotion on popular categories and adjust the strategy of selling less popular categories in more effective ways.

It is observed the top 5 growing categories during 2017 to 2018 are: Portateis(Portables) (+2075%), Fraldas (Diapers)(+1700%), Cine (Movies) (+700%), Industria (Industry) (+554.29%), Construcao (Construction)(+401.02%). The lowest growing 5 categories are: seguros (insurance) (-100.00%), cds(-92.31%), tablets(-63.93%), la(-60.00%), market(-43.98%). It is recommended that the company should focus on the customer's reviews and rating so that they can understand the customer's needs and wants.

Customers geography distribution and payment values analysis

Number of Customer by State

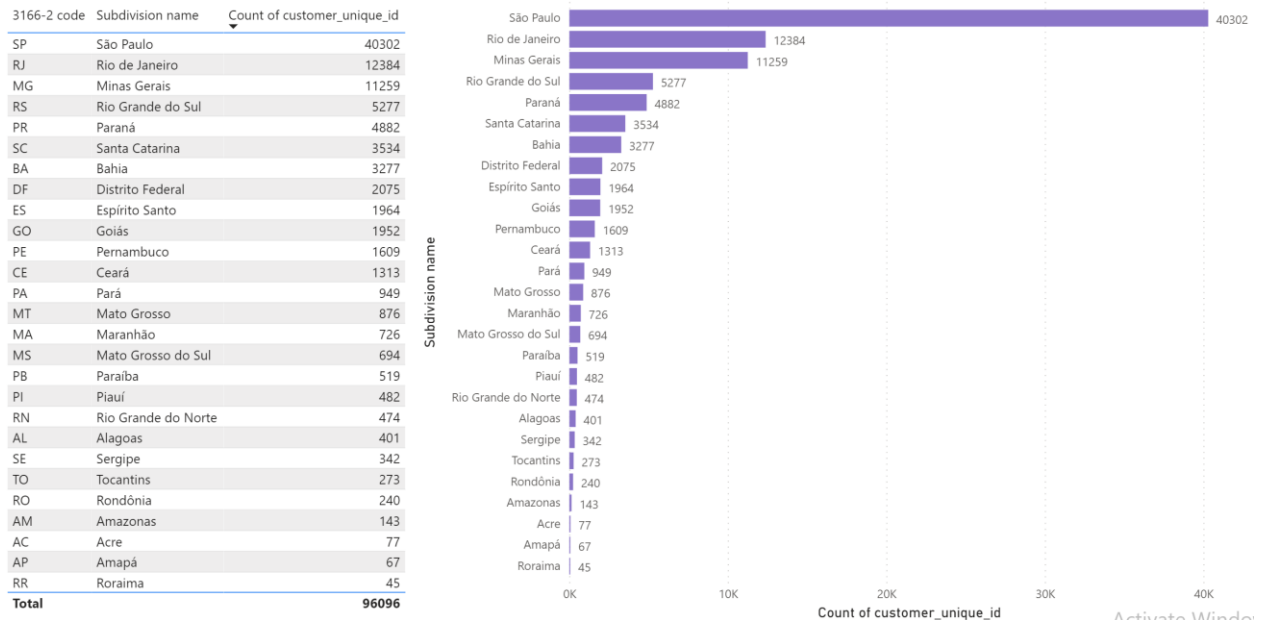| 3166-2 code	Subdivision name	Count of customer_unique_id
SP	São Paulo	40302
RJ	Rio de Janeiro	12384
MG	Minas Gerais	11259
RS	Rio Grande do Sul	5277
PR	Paraná	4882
SC	Santa Catarina	3534
BA	Bahia	3277
DF	Distrito Federal	2075
ES	Espírito Santo	1964
GO	Goiás	1952
PE	Pernambuco	1609
CE	Ceará	1313
PA	Pará	949
MT	Mato Grosso	876
MA	Maranhão	726
MS	Mato Grosso do Sul	694
PB	Paraíba	519
PI	Piauí	482
RN	Rio Grande do Norte	474
AL	Alagoas	401
SE	Sergipe	342
TO	Tocantins	273
RO	Rondônia	240
AM	Amazonas	143
AC	Acre	77
AP	Amapá	67
RR	Roraima	45
Total		**96096**

Figure 3.1 Number of customers by state

Figure 3.1 shows the number of customer grouped by state. The total customers is nearly 100K. We found out that São Paulo (SP) contains the most customers and is 3 times more than the second one. It is expected São Paulo has particularly the most order payment value. Either Rio de Janerio (RJ) or Minas Gerais (MG) takes 10% of total customers. This indicates that the top 5 states contributes 80% of total customers. It could be a treat when there is another e-commerce merchants who also get strong connections with sellers and consumers in these states as it may seize the market share of Olist sharply. Olist is recommended to expand sales network to more states and make it diversified to keep its sustainability in the future.
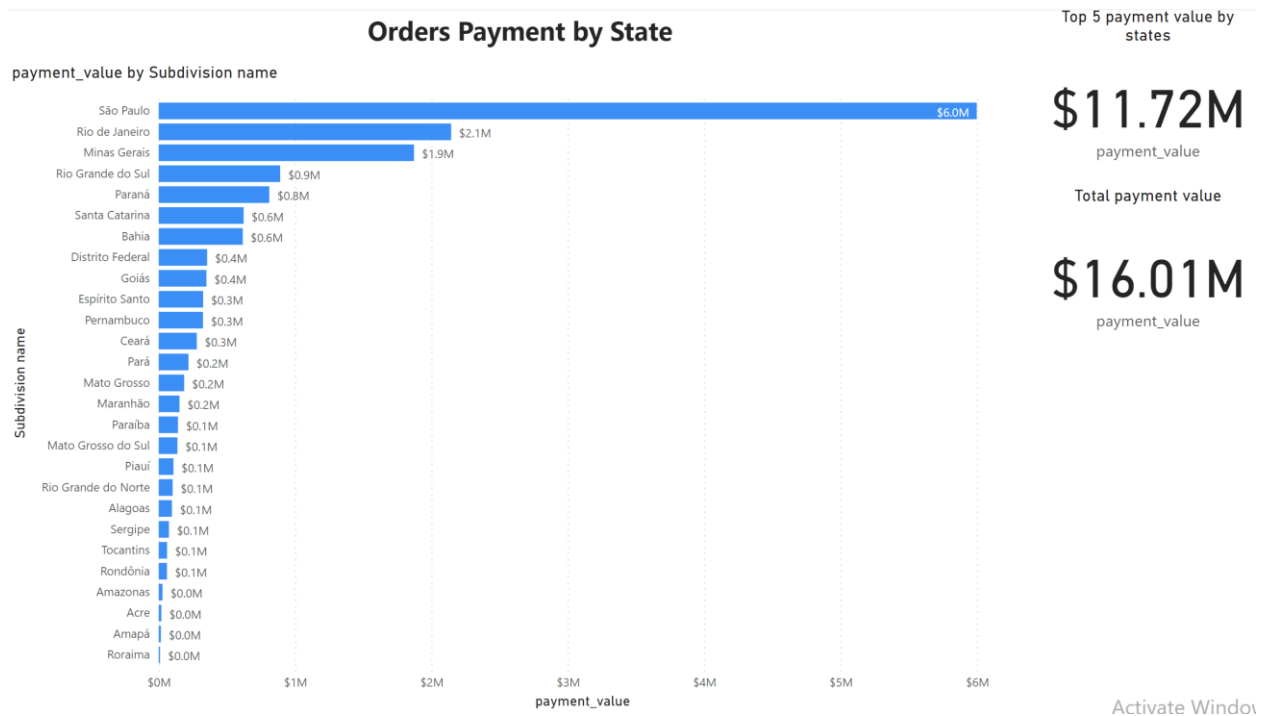
Orders Payment by State

payment_value by Subdivision name

Top 5 payment value by states

$11.72M
payment_value

Total payment value

$16.01M
payment_value

Subdivision name	payment_value
São Paulo	$6.0M
Rio de Janeiro	$2.1M
Minas Gerais	$1.9M
Rio Grande do Sul	$0.9M
Paraná	$0.8M
Santa Catarina	$0.6M
Bahia	$0.6M
Distrito Federal	$0.4M
Goiás	$0.4M
Espírito Santo	$0.3M
Pernambuco	$0.3M
Ceará	$0.3M
Pará	$0.2M
Mato Grosso	$0.2M
Maranhão	$0.2M
Paraíba	$0.1M
Mato Grosso do Sul	$0.1M
Piauí	$0.1M
Rio Grande do Norte	$0.1M
Alagoas	$0.1M
Sergipe	$0.1M
Tocantins	$0.1M
Rondônia	$0.1M
Amazonas	$0.0M
Acre	$0.0M
Amapá	$0.0M
Roraima	$0.0M

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Figure 3.2 Orders payments by state

Figure 3.2 shows as expected in the previous figure, São Paulo (SP) is the top 1 in this aspect of orders payment. The more customers they are, the more payment value it tends to be. Just as the state in which the top 5 customers are exactly mapped to the top 5 payment value. However, the top 5 payment takes around 70% of total payment value which is lower than the % of the total customers. It may have some higher order payment value in other states.

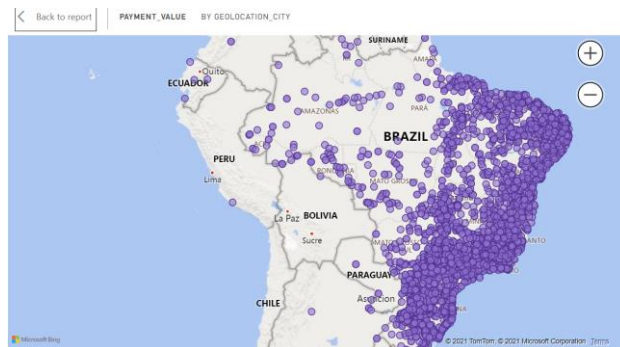Figure 3.3 Sellers' location distribution by seller_city

Figure 3.4 Customers' distribution by city

Figure 3.4 shows the best sales location distribution is similar with sellers' location distribution(figure 3.3), it can conclude that there is a co-relationship in the distance between seller and customer. The logistics cost increases because distance has a significantly positive effect on freight costs while sales amount is in negative effect. In order to improve the sales performance of states which are far from sellers , is it recommended to build logistics centers between them.
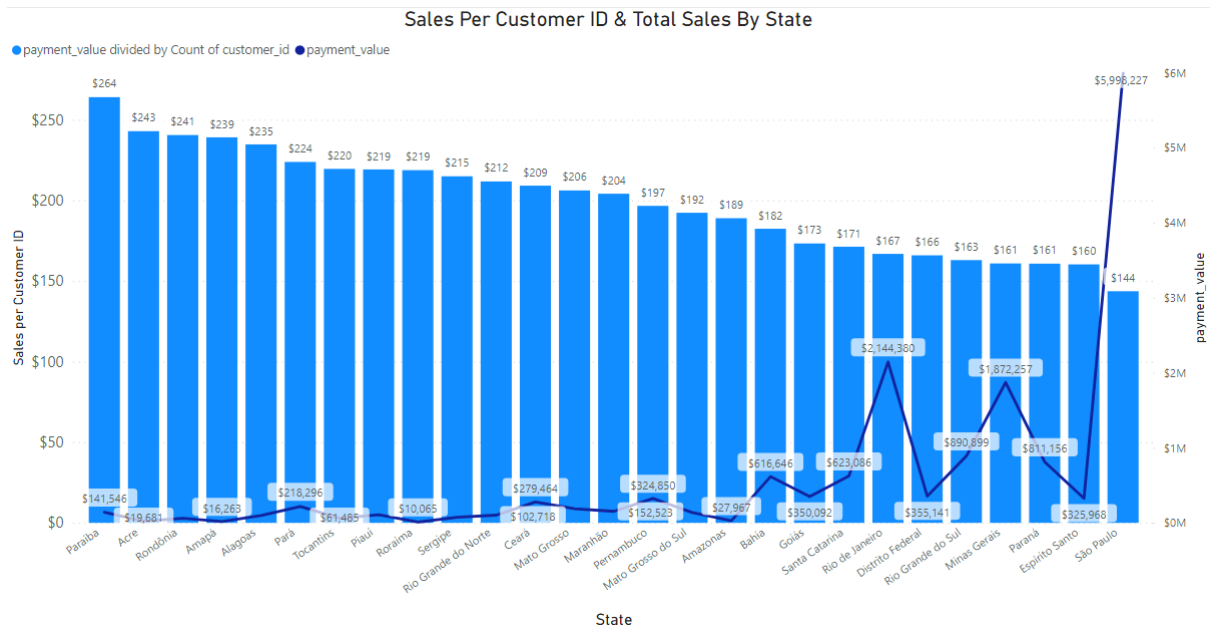
Figure 3.5 Sales Per Customer ID & Total Sales By State

Figure 3.5 indicates that São Paulo (SP) becomes the least one in average payment. There are invert relationship between average payment value by state and total payment value by state.
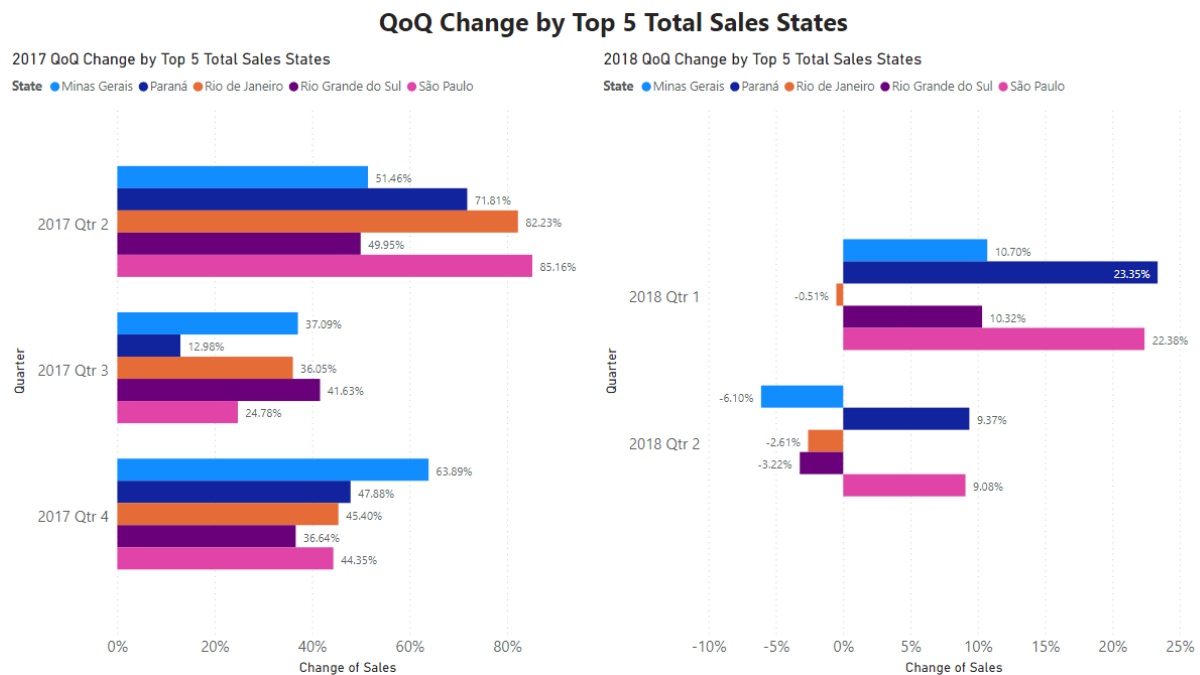
Figure 3.6 Top 5 payment value variation cities by year

Figure 3.6 shows the payment value QoQ% by state by the top 5 payment value. Since the range of the order purchase date in olist dataset is from 4/9/2016 to 17/10/2018. For complete comparison between quarters, QoQ is captured from 2017 Qtr 2 to 2018 Qtr 2.

From the figure, 2017 Qtr 2 has the most significant growth. Paraná (PR) has a substantial drop in 2017 Qtr 3 and recover in Qtr 4. The first negative growth occurs in 2018 Qtr 1 beginning in Rio de Janeiro (RJ) and expand to Minas Gerais (MG) and Rio Grande do Sul (RS). The last Quarter has the worst performance among them. Olist should be alert on the sales drop amount in these states as there might be a new competitor who shared the market or focus on the comment and reflection from these locations to understand customers' needs.

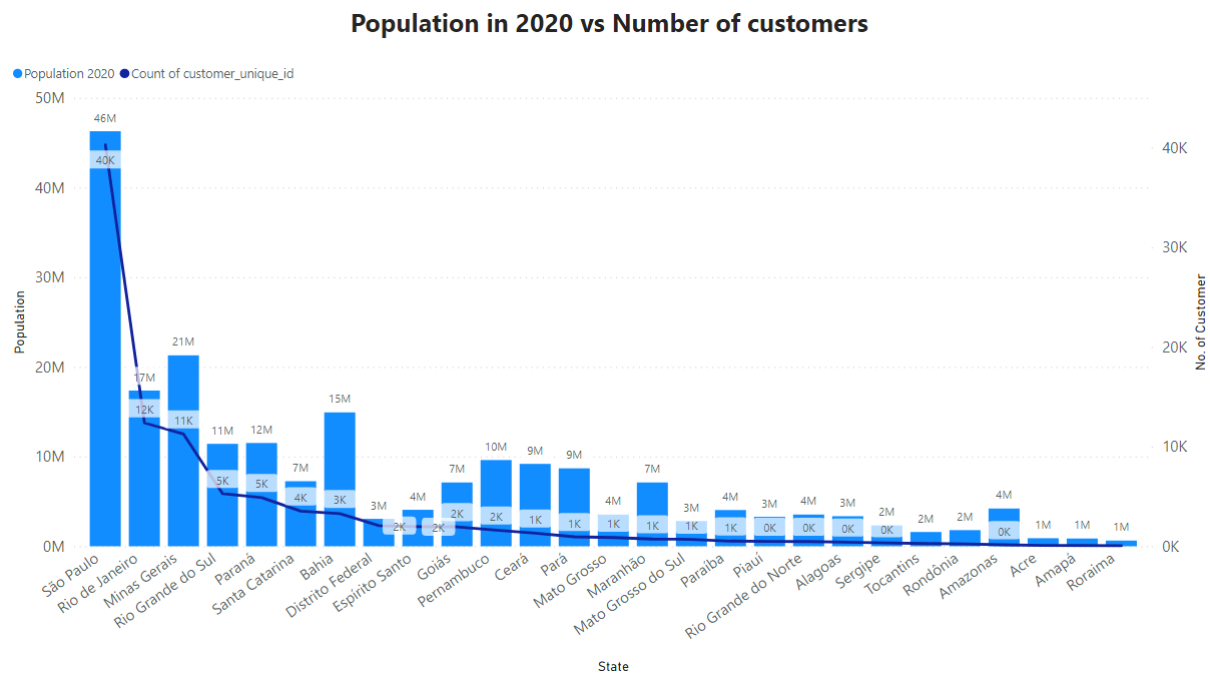**Population in 2020 vs Number of customers**

Figure 3.7 Number of 2020 population vs Number of customers

According to the chart above, the following state: Minas Gerais (MG), Bahia (BA), Pernambuco (PE), Ceará (CE), Pará (PR) and Maranhão (MA) which have relative lower percentage of customers by population. So it is expected the potential of ability to purchase is relatively higher than the others. Therefore they should be first focused on to increase the numbers of customers.

To let those people know Olist services as quickly as possible, TV and online advertising should be considered. Besides, Olist should perform sales promotion and coupon distribution for these specific states. This would end up driving sales quickly and hence increasing the total market share with a significant growth.
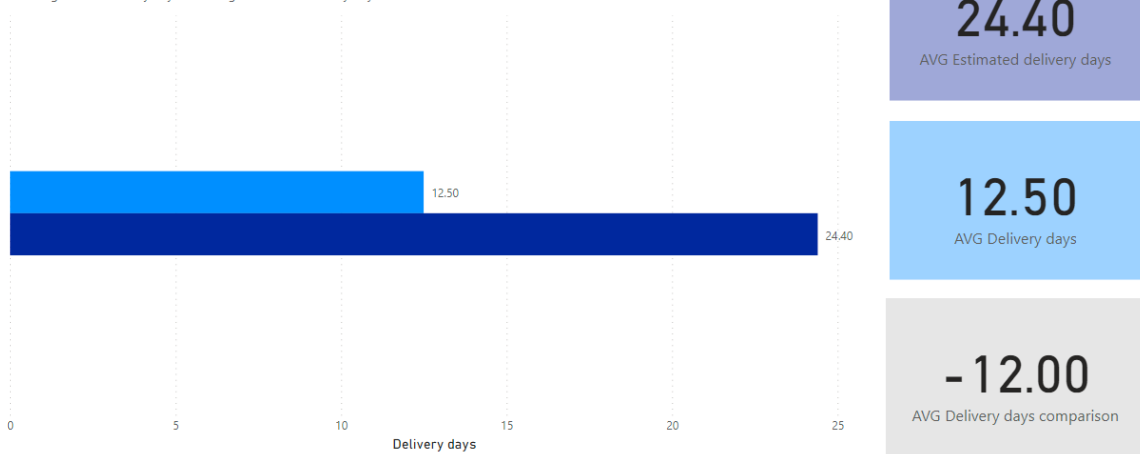
Delivery duration analysis

Figure 4.1 Comparison of actual delivery days and estimated delivery days

Figure 4.1 indicates that Olist's estimated average delivery time is 24.4 days. In fact, according to the data, the actual delivery time is 12.5 days, which is 12 days faster than expected. It would help to manage the customers' expectations. The customers would obtain the products under the committed time.
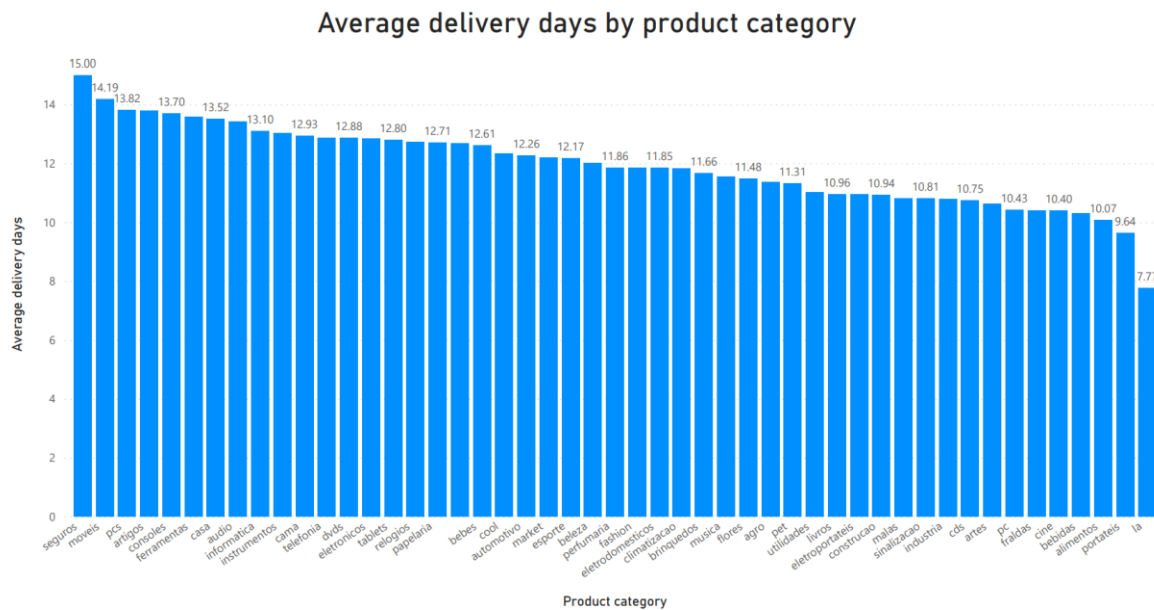
Figure 4.2 Average delivery days by product category

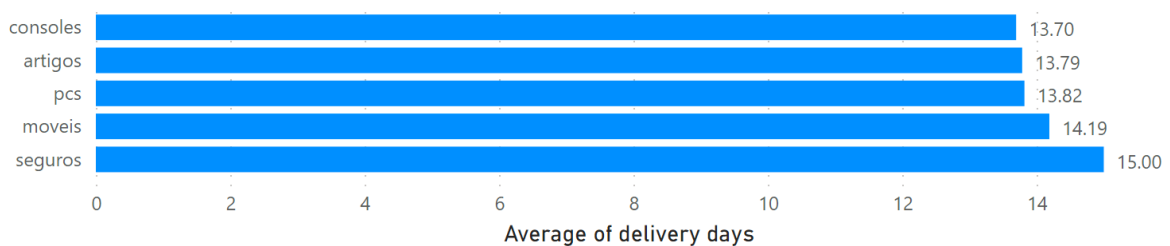Figure 4.3 Top 5 fastest delivery time of product category

Figure 4.4 Top 5 slowest delivery of product category

Figure 4.3 shows that the 5 shortest delivery product categories are La Cuisine(la), small appliance(portateis), food(alimentos), drinks(bebidas), camera(cine) and diapers & hygiene(fraldas). La Cuisine, which is a renowned kitchen brand, the average delivery day is 7.7 days. Small appliance, F&B, camera and diapers' delivery days are very close, around 10 days. It could be summarized that the logistics time of FMCG products are relatively faster than other categories.

Figure 4.4 illustrates that the 5 longest delivery product categories are console games(consoles), party related suppliers(artigos), computers(pcs), furniture(moveis), and security & services(seguros). Those products involve complex logistic arrangements like

furniture's scale and reassure that the delivery address may take time to process. The electronic products also take more time to finish the delivery process. This may be related to the high demand on the product and suppliers need more time to process the logistics than other products. Olist could invest more resources on improving the logistic time on large-size products and high-value electronics products. They could further discuss the logistic arrangement with those suppliers to work out a better solution.
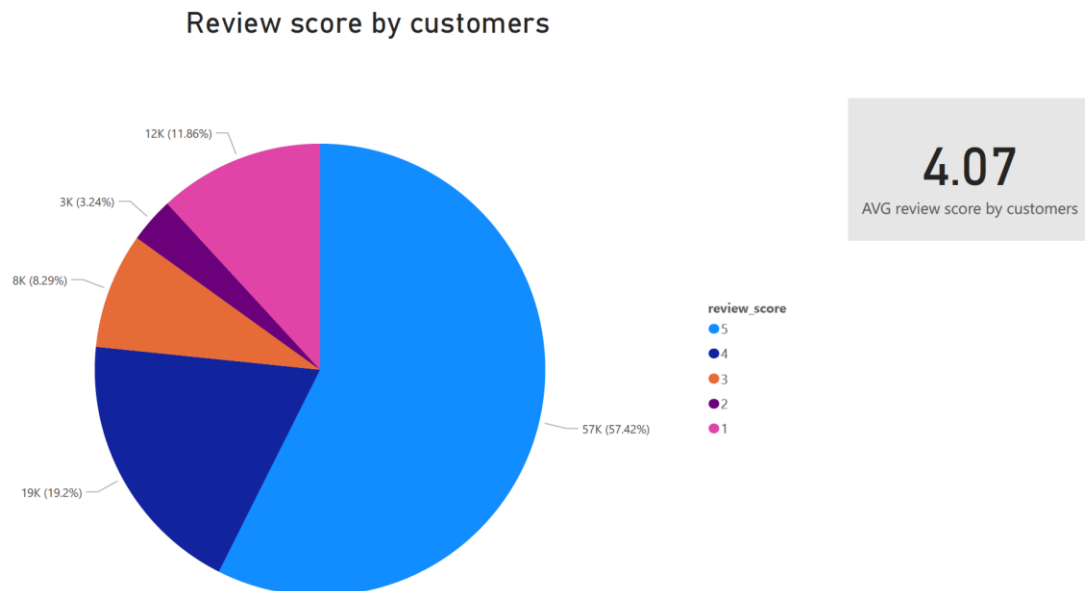
Customer satisfaction review analysis

Figure 5.1 Review score by product category

The figure shows the distribution of the review score by customers. The average score is 4.07/5, which is a high score. 57% of customers gave 5 marks, nearly 20% of them gave 4 marks. 5 marks and 4 marks are more than 77% of overall customers. This is a crucial indicator to reflect that most Olist's customers are satisfied with the product and the service.

Olist needs to be pay attention is the lowest mark and second-lowest mark. Although they count around 15% of the overall customers, these customers who are not satisfied with the product or service may change to other e-commerce platforms.

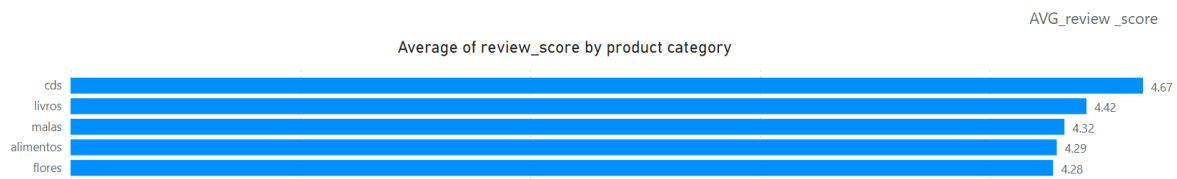Figure 5.2 Overall product categories review score by customers

AVG_review_score

Average of review_score by product category

Category	Score
cds	4.67
livros	4.42
malas	4.32
alimentos	4.29
flores	4.28

Figure 5.3 The 5 highest review score of product category

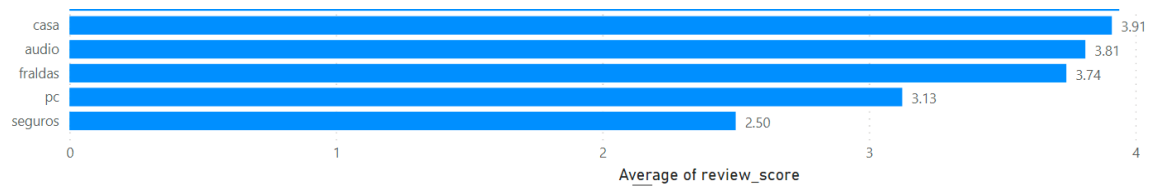| Category	Score
casa	3.91
audio	3.81
fraldas	3.74
pc	3.13
seguros	2.50

Average of review_score

Figure 5.4 The 5 lowest review score of product category

Figure 5.4 indicates that the highest review scores of product categories are cds, book(livros), luggage(malas), food(alimentos) and flowers(flores).

The figure 5.3 shows that the 5 lowest review scores of product categories are casa, audio, diapers and hygiene(fraldas), pc, and security & services(seguros). The precious figure xx mentions that computers and security & services take a long time to deliver. It could be the critical factor to determine the review score by customers.

Recommendation

Olist should focus on those categories with more than average delivery time and shorten the delivery time to compete with other e-commerce platforms such as mercadolivre.com.br, olx.com.br and americanas.com.br. For the long delivery days product categories, security & services(seguros) and furniture(moveis) could target the delivery days from more than 15 days to to 13 days. Target computers(pcs), party related suppliers(artigos) and console games(consoles) delivery days from around 14 days to 12 days. If not, 15% of customers may switch to other platforms. Customers are the core part of e-commerce. The customer base will have a higher probability of driving more sales amounts and help the company to expand the business overseas.

The customers' review score is limited to the score but lacks different aspects of review. It is difficult to identify the score based on which part of the service, it could be product, delivery arrangement, product quality, etc. Olist should set the review score survey based on product's pricing, quality, delivery arrangement and customer service aspects. It would help to build a comprehensive score review.