

## DVT Lab 3 – Group 1

The 5 main KPIs we decided to focus on were:

1. Average review score
2. Churn rate of customers
3. Average revenue generated
4. Top 10 products of the top 3 performing states
5. Number of sales

Targets:

1. Store Managers
2. Executive teams

We analysed the yearly trends of these KPIs focusing primarily on the different product categories in a particular state.

### 1. Average review score

Our business must track customer satisfaction to find specific problems our customers are repeatedly experiencing.

Geolocat..	Product Categor..	Order Purchase Timestamp 2018
São Paulo	fashion_bags_ac..	▲104.78%
	sports_leisure	▲77.36%
	baby	▲16.68%
	perfumery	▼-8.25%
	health_beauty	▼-59.89%
	toys	▼-147.11%

There wasn't enough data for reviews scores in 2016 so it's displaying mostly for 2018

*Figure 1 Average Review Scores*

### **Analysis:**

The scorecard above compares the average review scores for five product categories in Sao Paulo. We can observe that baby, fashion\_bags\_accessories, and sports\_leisure categories show increasing. However, perfumery, health\_beauty, and toys in 2018 received lower review scores than review scores in 2017, although the preferred product category for customers is health\_beauty. Furthermore, the average review scores for toys in 2018 resulted in significant decreases as - 147.11%. We found insufficient information in 2016 to analyze historical performance for review scores.

### **Root cause analysis: "5-whys" approach**

**Problem:** There have been noticeable drops in customer review ratings in product categories - Toys, Health\_beauty, and Perfumery in 2018.

Asking why this problem is occurring to analyze as below:

#### **1. Why?**

Answer 1: Some customers are unhappy with the products sold and services provided.

#### **2. Why?**

Answer 2: The products and services they received didn't meet or go beyond customers' expectations.

#### **3. Why?**

Answer 3: We introduced more new products to the categories in response to the product line expansion objective, but according to the scorecard, those products didn't satisfy our customers.

#### **4. Why?**

Answer 4: We were unaware that the suppliers' products didn't meet our quality requirements.

#### **5. Why?**

Answer 5: There were not enough effort done with suppliers to ensure product quality at the stage of purchasing inquiries and shipment received

As online review scores can demonstrably impact our business and brand's reputation, new item purchasing planning with suppliers is crucial at this stage. Also, immediate actions are required to improve product qualities and services for customer satisfaction. Our new focus on customer satisfaction should encourage positive conversations about our new products. For example, we should have a new strategy for more care for our customers and personalized responses so customers' positive reviews and high review scores can bring new customers. Simultaneously, we need to see how our competitors sell products in the same categories and set realistic, achievable,

and time-bound goals for customer satisfaction. We need to take immediate actions with the customers who gave lower scores by communicating with them. Through the communication, we can acknowledge their customer experience, and share what actions we have taken to measure the issues. We can also tell them how valuable their business with us is and ensure improvement in future. Each customer's life-time-value is extremely important, and these actions must be taken promptly whenever it happens. Good

## 2. Churn Rate of Customers

The churn rate of customers denotes how many customers stopped doing business with our company for a particular period. In our case, we are comparing the difference between the yearly churn rate for different product categories in a particular state.







Churn rate of Customers		Aditya Manikantan	
Geolocat..	Product Category N..	Order Purchase Timestamp 2018	
São Paulo	baby		↓ 17.88%
	fashion_bags_acces..		↑ 11.38%
	health_beauty		↓ 13.55%
	perfumery		↑ 6.89%
	sports_leisure		↓ 2.49%
	toys		↑ 16.68%

Figure 2 Churn rate of customers

### Analysis:

The above graph illustrates the change in trend in the churn rate of customers buying the given product in Sao Paulo from 2017 to 2018.

We can see that the churn rate for “toys” increased by 16.68% which could point to the fact that customers are not satisfied with the product and has stopped buying them anymore. On the flip side of this spectrum several categories like “baby”, “health and beauty”, and “sports and leisure” products has seen a negative churn rate of 17.88%, 13.55%, and 2.49% respectively. This significant decline suggests the fact that customers are encouraged to come back time and again for these products in Sao Paolo. Apart from this, “fashion bags and accessories”, and “perfumery” witnessed a moderate increase in the churn rate of customers.

### Root cause analysis:

On analysing **Figure 1**, we can see that the average review score for “toys” witnessed a sharp decline of -147.11% in 2018. From this, we can assume that there could be an inverse correlation between the review scores and the churn rate since the churn rate for “toys” saw a growth in 2018. So, to improve the customer retention in these sectors we could either improve the quality of toys we provide or improve the services related to them.

### 3. Average revenue generated:

The average revenue is a simple calculation taking the total of the sales divided by the total amount of the states. This indicator helps us to see which states rise above the average of the sales by quarter.

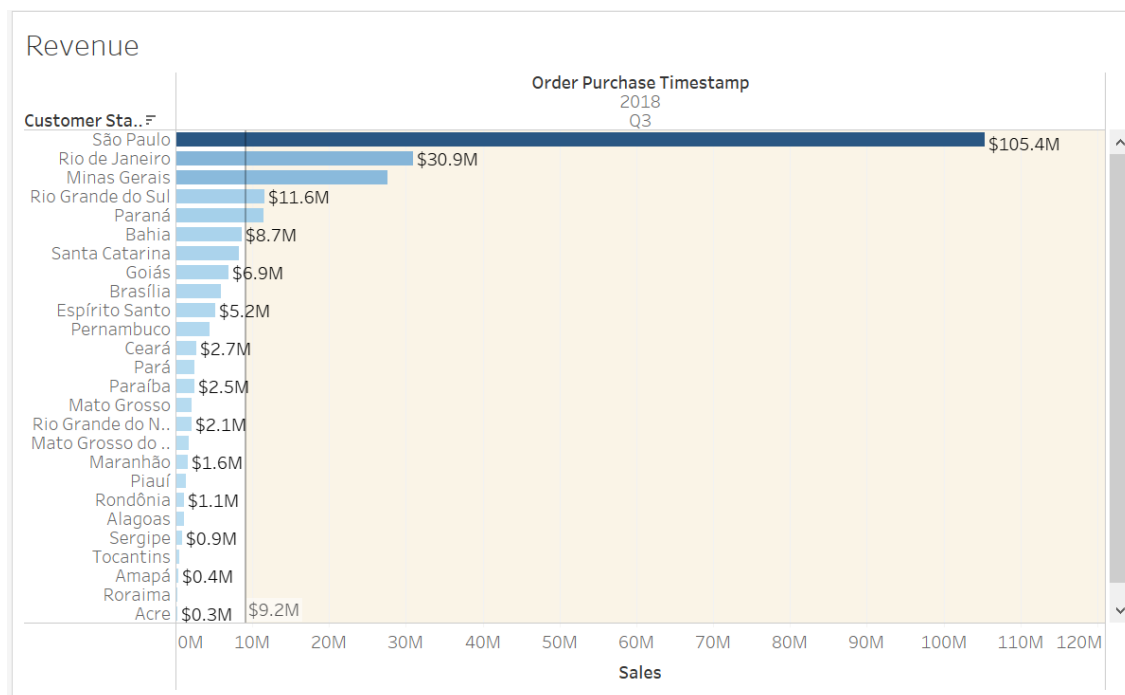


Figure 3 Average quarter sales by State

### Analysis

The above graphic depicts the total sales by states in a quarter period in 2018. The yellow shadow is shown to represent the states that have surpassed, met, or failed to meet the average quarter sales. There is a noticeable contrast between the customer states that rise above the average quarter sales, Rio de Janeiro, is such example, with a sale of \$30.90 M in the quarter selected. On the order hand, Bahia, with a sale of \$8.7 M, failed to meet and surpass the quarter average sales. Furthermore, it is evident that Sao Paulo, with a total sale of \$105.4M in the selected quarter has the greatest number of total sales in the period selected. The reasoning behind these statistics can suggest that Sao Paulo, as a largely populated state would attract a greater number of sales in comparison to other less populated states such as Acre, whose sales only compiled to the lowest total value of \$0.3 M.

### Root cause analysis:

The statistic shown above can suggest that the reasoning behind such contrast in sales between states such as Sao Paulo and Acre ultimately can be relied upon the large difference in population

and tourism statistics. Sao Paulo and Rio de Janeiro are states that represent a much larger population, among them a larger percentage of potential customers. In addition, it can be suggested that due to these factors among others, there are more stores accessible to the population attracting more sales. A possible solution to improve the sales in other states that fail to meet the average include expanding their stores to these other locations with less sales and improving in marketing strategies, including more advertisement.

#### 4. Revenue generated by products of top 3 performing states

Top 10 products of the top performing states

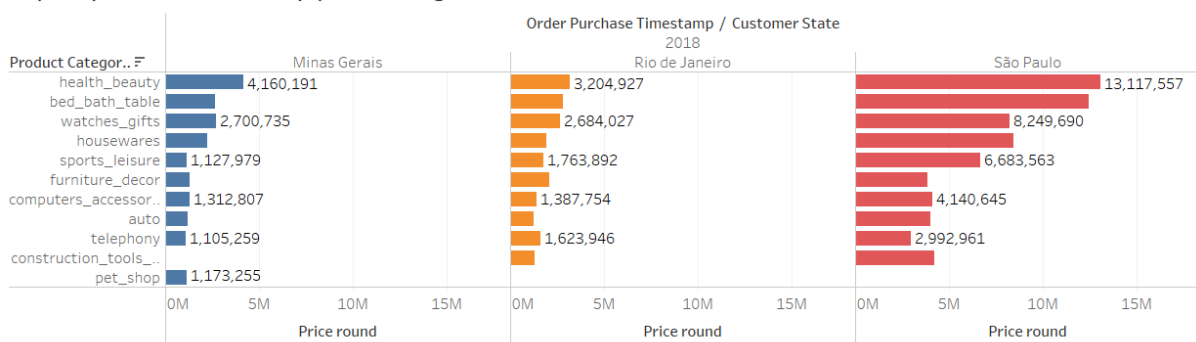


Figure 4 Average revenue sales contribution by different product categories

Here we look at the top 3 performing states according to the average revenue generated which is being showed by the Trend line in 4<sup>th</sup> point of “Average Revenue growth”.

#### Analysis

In figure 3, we looked at the top performing states based on the sales revenue that they generated at Q3, 2018. Here in Figure 4, we went much deeper, and we selected different product categories of top 3 performing states and we analysed their contribution to the overall Revenue generation. We can see that the product categories like bed bath table, computer accessories, health beauty are the top performers in terms of revenue generation for different cities while product categories like cine photos, book imported, CDs DVD musicals are the least contributing ones.

#### Root Cause Analysis -

The graph suggests how much, people living in these cities are inclined toward products, meanwhile not being interested in others. These low revenue generating products can be improved by creating awareness among the local public residing in these cities, moreover, by pushing more money into Advertisement and marketing section can lead to increase in sales of these specific products. If the sales are still not increased, we can limit the inventory size according to the demand of the public.

#### 5. Relative Change in Number of Orders

In the plot below we have shown how orders for different categories changed from 2017 to 2018. For this analysis we did not consider data from 2016 as there were a number of missing values in the 2016 data. Overall the number of orders increased by 111,794 across all categories from 2017 to 2018.

### Event Correlation

In line with our previous analysis the majority of the increased orders came from the “health and beauty” and other similar types of categories. In fact, “health and beauty”, “watches” and “sports leisure” categories overall had an increase of >100k in the number of orders. A similar increase was observed in other related categories. This observation is also shown in the diagram below.

Geolocalization	Product Category	Order Purchase Timestamp	
		2017	2018
São Paulo	health_beauty	100k	162.14k
	sports_leisure	100k	131.86k
	watches_gifts	100k	190.99k

Figure 5 Number of Orders

On the other hand, the Toys category saw a significant hit in the number of orders from 2017 to 2018. For the toys category the number of orders decreased by 94,260k. This category was most significantly hit when going from 2017 to 2018.

### Analysis

We can see from the data that categories which saw a significant increase in the number of orders were closely related. For e.g., “health and beauty”, “watches” and “sports leisure” categories have a similar customer segment. These product categories are usually popular amongst teenagers and young adults. On the other hand, categories which saw a significant downturn in the number of orders are categories which are popular in middle-aged and older households, e.g. “home

construction", "baby". This can have some correlation to the fact that Brazil's GDP fell when going from 2017 (1.7T) to 2018(2T).

From these observations we hypothesize that the product demand increased significantly amongst younger customers. To build upon this demand we can focus on products which are popular amongst teen and young adults.