

# Executive Summary

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## Introduction

Olist sales data from over 100,000 online transactions were collected between January 2017 – August 2018. Sales amounts will be the primary focus in this analysis; therefore it is important to have a begin with a simple understanding of the current sales trend over this period.

Total Sales Amount by Month



It is evident that overall sales have increases month over month, with substantial growth in 2017. However, it can also be said that growth has slowed (even declined) in recent months, with no real growth in all of 2018.

This summary will analyze this trend and make several forecasts to learn how these trends may persist several months into the future.

## About Olist

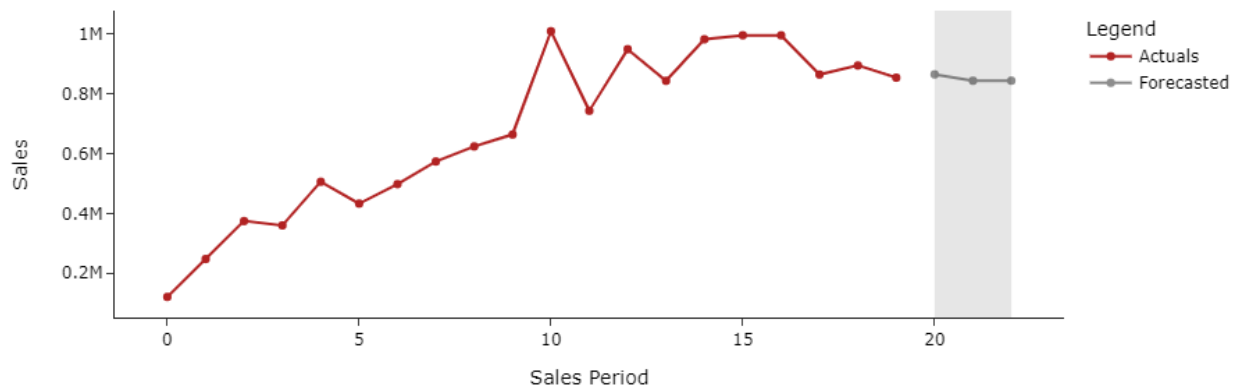
Olist is a Brazilian-based e-commerce site that provides a Software as a Service offering to merchants. Olist empowers its users to connect their products to the primary online marketplaces of Brazil. Olist handles the payment processing and the logistics on-behalf of the merchant, which helps smaller businesses with less resources gain market share across Brazil.

## Analysis 1: A three-month Forecast of Future Sales

The first analysis will focus on the overall sales trend (as seen in the introduction) and three-month forecast of sales; from September 2018 – November 2018. The three-month forecast continues to show a nearly flat growth into the future. The forecasted values are:

- September 2018: \$875,559.26
- October 2018: \$855,117.82
- November 2018: \$867,756.18

3 Month Forecast of Sales, ARIMA(2,1,1)



One aspect that this forecast does not account for is the expected increase in sales amount due in November due to Black Friday. In the previous year, we see a considerable spike in November that is purely due to Black Friday.

**Technical Alert:** A model that accounted for exogenous variables (ARIMAX), with month as a regressor, was tested with a hope of catching this increase in the model. However, the results of that model were less convincing than the one provided in this summary.

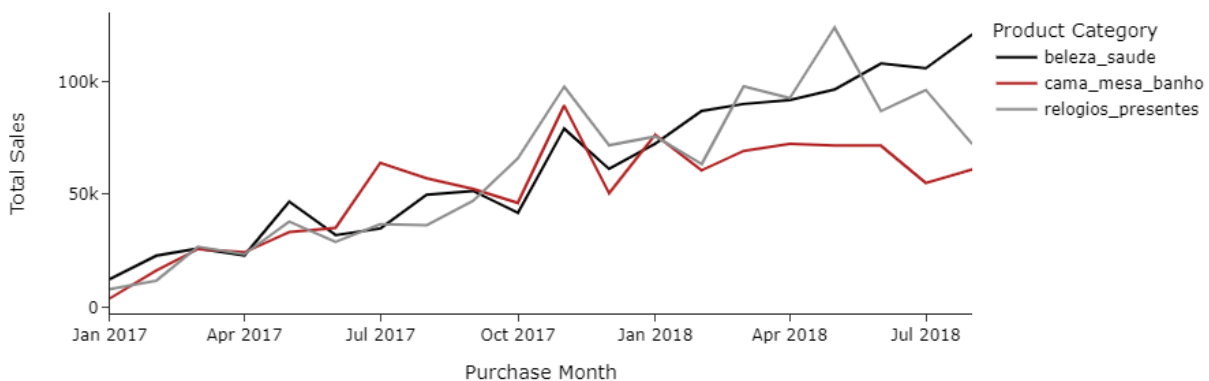
## Analysis 2: Forecasted Growth for the top-three best-selling Product Categories

The three best-selling product categories were determined by total sales over the period. It was calculated that the three best-selling categories are:

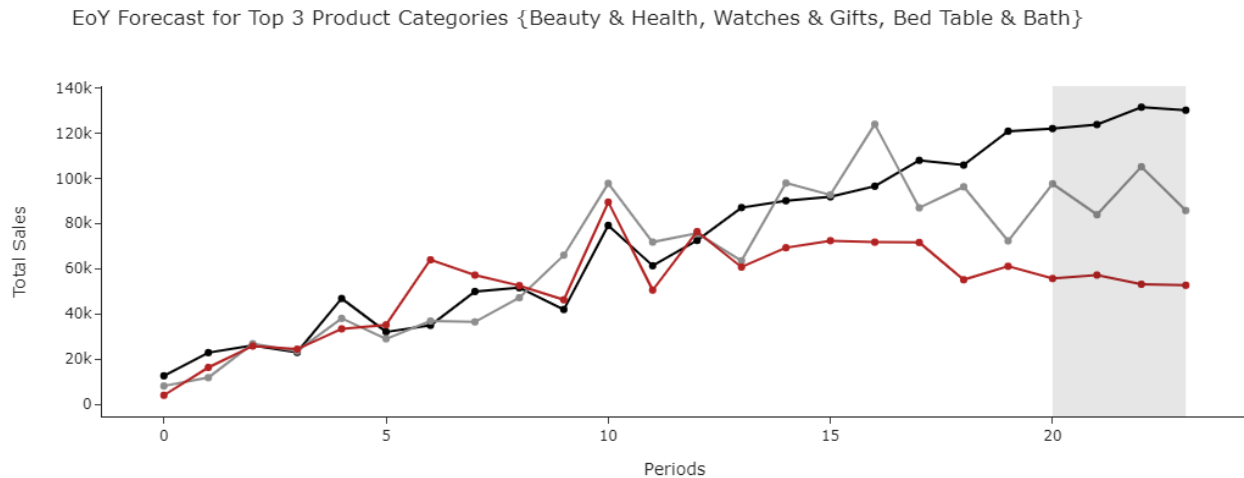
1. Beauty & Health: 1.256M
2. Watches & Gifts: 1.205M
3. Bed, Table, and Bath: 1.037M

Shown below are the sales trends for each of the categories from January 2017 – August 2018.

Monthly Sales of the Top 3 all-time Product Categories



Now that we understand the sales trends for these categories, we are interested in knowing how the growth over the rest of 2018. The plot below presents the forecasts of each product category through December 2018.



#### *Beauty & Health*

- September 2018: 121.96K
- October 2018: 123.74K
- November 2018: 131.43K
- December 2018: 130.08K

#### *Watches & Gifts*

- September 2018: 97.55K
- October 2018: 83.83K
- November 2018: 105.08K
- December 2018: 89.70K

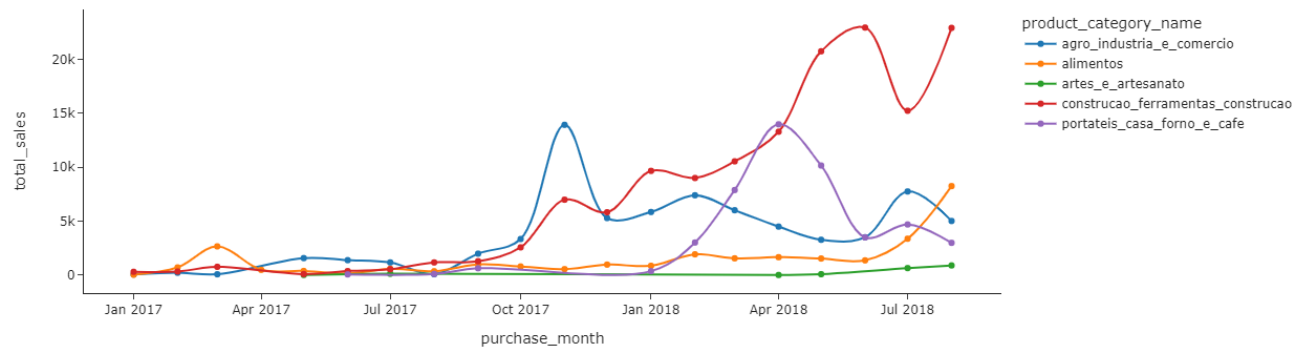
#### *Bed, Table & Bath*

- September 2018: 55.61K
- October 2018: 57.16K
- November 2018: 53.08K
- December 2018: 52.63K

## Analysis 3: Forecasted Growth for the fastest-growing Product Category

In this final analysis, the product category with the fastest growing sale will be determined and forecasted from September 2018 – December 2018. Combining a mathematical approach to calculate the product categories with the highest average monthly growth rate with a visual analysis of sales growth, I conclude that the fastest growing product category is Construction Tools & Construction. The sales trend for this category is shown as the red line in the plot below:

Monthly sales for the top growing categories based on the Median MoM growth rates



Now, forecasting future sales for Product Category - Construction Tools and Construction, it can be seen that sales should continue to increase at a similar rate that has been achieved over the last 12 months. The forecast is shown below:

EOY forecast for Product Category = Construction Tools and Construction

