Data Analysis Report: Key Insights and Process

Data Analysis Process

Steps:

1. **Grasping the Data**:

   o Loaded the data into Power BI and reviewed it to understand the key fields like order_id, delivery_time, customer_state, and product_category.

2. **Data Sanitization**:

   o Created Unique columns to make join with other tables. e.g. customer_state_zip_code_prefix.

   o Removed error data using Power Query, e.g. filter orders with null delivery_expected_date

   o Added some calculated fields, such as "On-Time Delivery Percentage" and "Average Order Value."

3. **Data Associations**:

   o Connected tables for orders, products, customers, review, and payments.

   o Used formulas to calculate important measures like total revenue, average review score, and on-time deliveries.

4. **Building Dashboards**:

   o Developed clearly, interactive visuals like line charts, bar charts, pie charts, and maps.

   o Grouped visuals into five main categories: Deliveries, Customer orders, Sellers, Assortment and Demand, and Product Reviews.

Some Key Insights:

A. Executive Overview
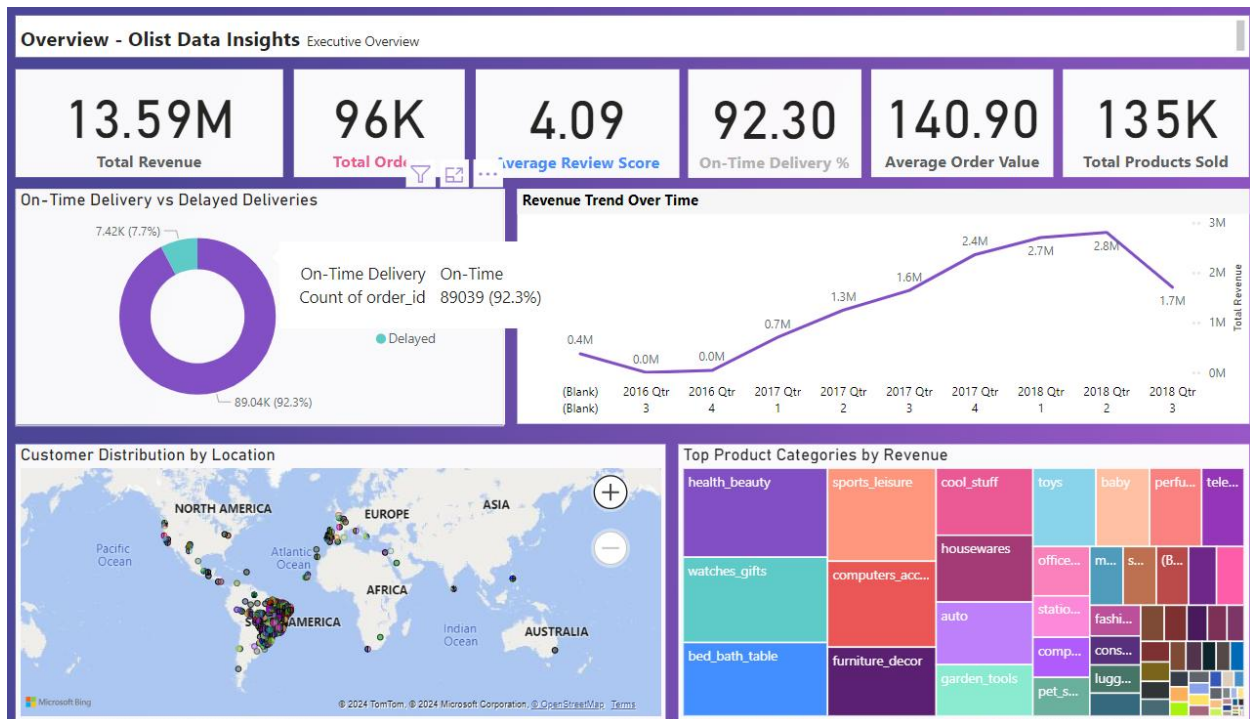
- **Ecommerce Business Performance**:

    - The company earned **$13.59M in total revenue** from **96,000 orders**, highlighting a excellent performance.

- **On-Time Delivery**:

    - An striking **92.3% of orders were delivered on time**, indicating good logistics.

- **Revenue Trends**:

    - Revenue increased progressively from **2016 to 2018**, peaking at **$2.8M** in 2018 Q2.

- **Top-Selling Products**:

    - The top-performing categories include **health & beauty, watches & gifts, and electronics.**

B. Order Delivery Insights

Order Deliveries - Insights
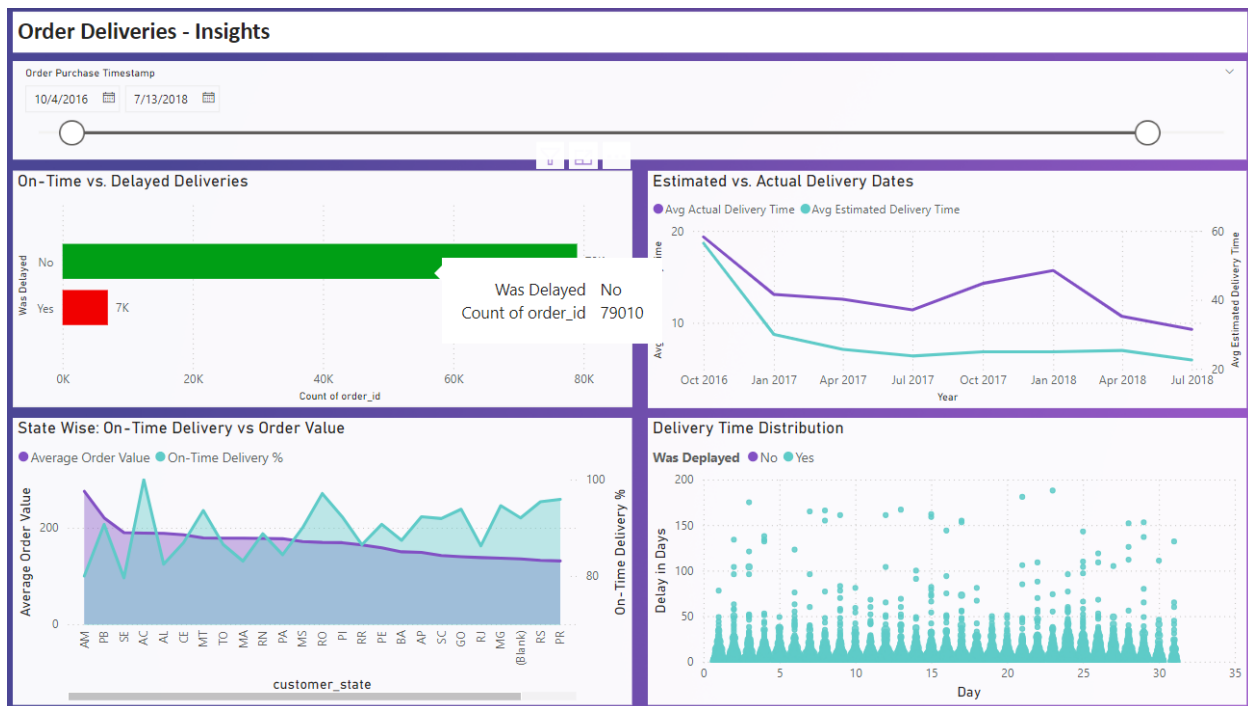
- **Delivery Timeliness**:
  - Out of all orders, **7,000 were delayed**, accounting for **7.7%** of the total.

- **Estimated vs. Actual Delivery**:
  - Delivery times have enhanced over the years, with the gap between estimated and actual dates declining significantly.

- **State-Wise Performance**:
  - States like **SP and MG** create significant revenues but have slightly lower on-time delivery percentages.

- **Delay Analysis**:
  - Most delays arise between **15–30 days**, highlighting areas for shipping improvements.

C. Customer Insights
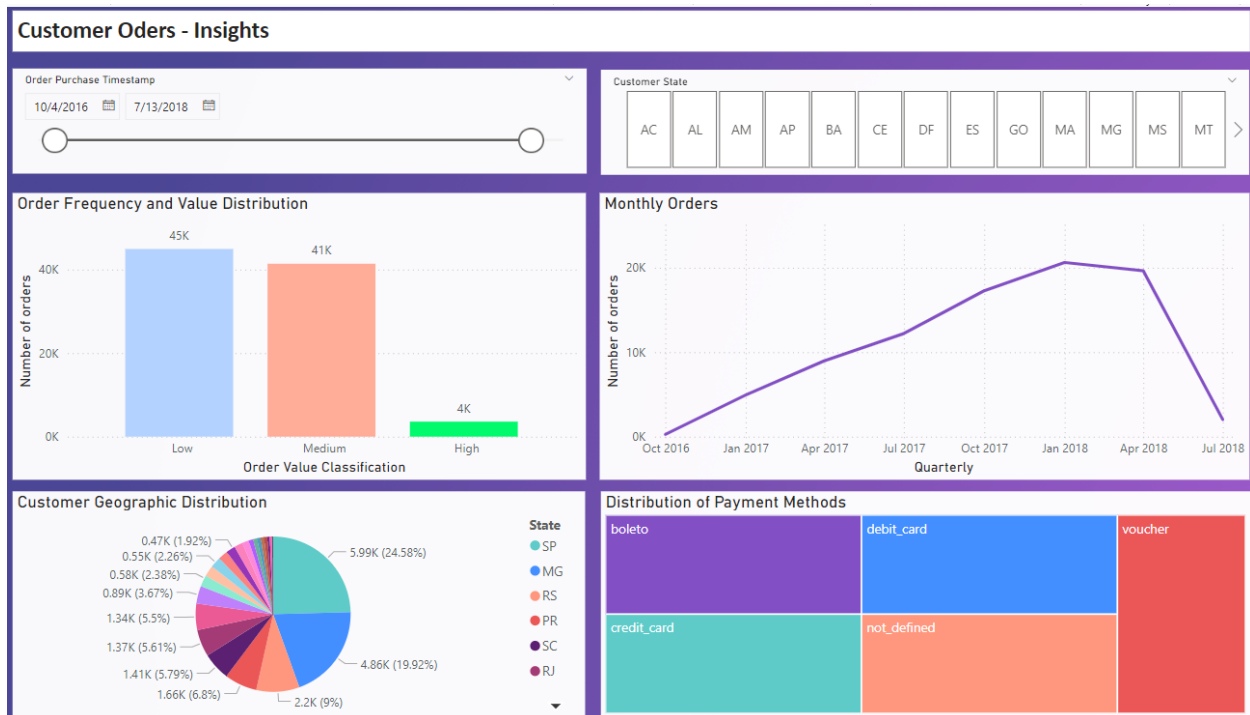
- **Order Value and Frequency**: (Orders are classified as **Low** if the payment is less than 100, **Medium** if it's between 100 and 500, and **High** if it's above 500)

  - Most orders are **low-value (45K)**, while **high-value orders (4K)** make up a smaller percentage.

- **Geographical Insights**:

  - **SP and MG** states have the maximum order volumes, adding to almost **45% of total orders.**

- **Payment Methods**:

  - **50% of customers use credit cards**, followed by **boletos** and debit cards.

- **Monthly Trends**:

  - Orders gradually grew until early 2018, matching with the revenue peak.

D. Sellers

Sellers insights

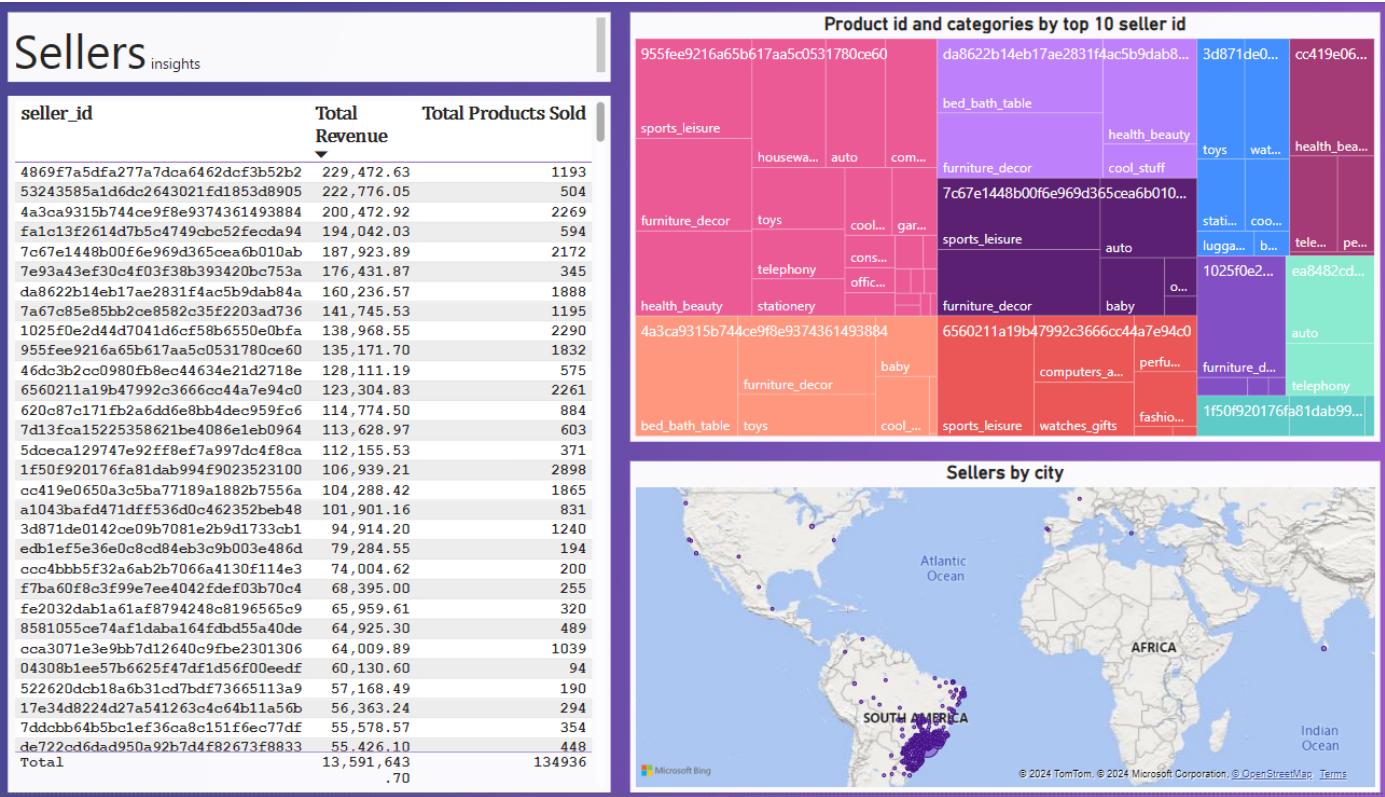| seller_id	Total Revenue	Total Products Sold
4869f7a5dfa277a7dca6462dcf3b52b2	229,472.63	1193
53243585a1d6dc2643021fd1853d8905	222,776.05	504
4a3ca9315b744ce9f8e9374361493884	200,472.92	2269
fa1c13f2614d7b5c4749cbc52fecda94	194,042.03	594
7c67e1448b00f6e969d365cea6b010ab	187,923.89	2172
7e93a43ef30c4f03f38b393420bc753a	176,431.87	345
da8622b14eb17ae2831f4ac5b9dab84a	160,236.57	1888
7a67c85e85bb2ce8582c35f2203ad736	141,745.53	1195
1025f0e2d44d7041d6cf58b6550e0bfa	138,968.55	2290
955fee9216a65b617aa5c0531780ce60	135,171.70	1832
46dc3b2cc0980fb8ec44634e21d2718e	128,111.19	575
6560211a19b47992c3666cc44a7e94c0	123,304.83	2261
620c87c171fb2a6dd6e8bb4dec959fc6	114,774.50	884
7d13fca15225358621be4086e1eb0964	113,628.97	603
5dceca129747e92ff8ef7a997dc4f8ca	112,155.53	371
1f50f920176fa81dab994f9023523100	106,939.21	2898
cc419e0650a3c5ba77189a1882b7556a	104,288.42	1865
a1043bafd471dff536d0c462352beb48	101,901.16	831
3d871de0142ce09b7081e2b9d1733cb1	94,914.20	1240
edb1ef5e36e0c8cd84eb3c9b003e486d	79,284.55	194
ccc4bbb5f32a6ab2b7066a4130f114e3	74,004.62	200
f7ba60f8c3f99e7ee4042fdef03b70c4	68,395.00	255
fe2032dab1a61af8794248c8196565c9	65,959.61	320
8581055ce74af1daba164fdbd55a40de	64,925.30	489
cca3071e3e9bb7d12640c9fbe2301306	64,009.89	1039
04308b1ee57b6625f47df1d56f00eedf	60,130.60	94
522620dcb18a6b31cd7bdf73665113a9	57,168.49	190
17e34d8224d27a541263c4c64b11a56b	56,363.24	294
7ddcbb64b5bc1ef36ca8c151f6ec77df	55,578.57	354
de722cd6dad950a92b7d4f82673f8833	55,426.10	448
Total	**13,591,643.70**	**134936**

Table 1: Here we can clearly distinguish sellers by Total revenue and total products sold by them.

Product id and categories by top 10 seller id: This will help to find important sellers what they are selling.

Sellers by city: Here we can see the number of sellers in a given city.

E. Assortment & Demand Insights

product_category_name_english	Total Revenue	Total Products Sold
bed_bath_table	1,036,988.68	13665
furniture_decor	729,762.49	11540
health_beauty	1,258,681.34	11081
sports_leisure	988,048.97	9932
computers_accessories	911,954.32	9874
housewares	632,248.66	9051
watches_gifts	1,205,005.68	6594
garden_tools	485,256.46	5874
telephony	323,667.53	5161
auto	592,720.11	4881
toys	483,946.60	4445
cool_stuff	635,290.85	4077
perfumery	399,124.87	3785
baby	411,764.89	3427
stationery	230,943.23	2805
office_furniture	273,960.70	2538
pet_shop	214,315.41	2276
musical_instruments	191,498.88	766
small_appliances	190,648.58	745
computers	222,963.13	235
Total	11,418,791.38	112752

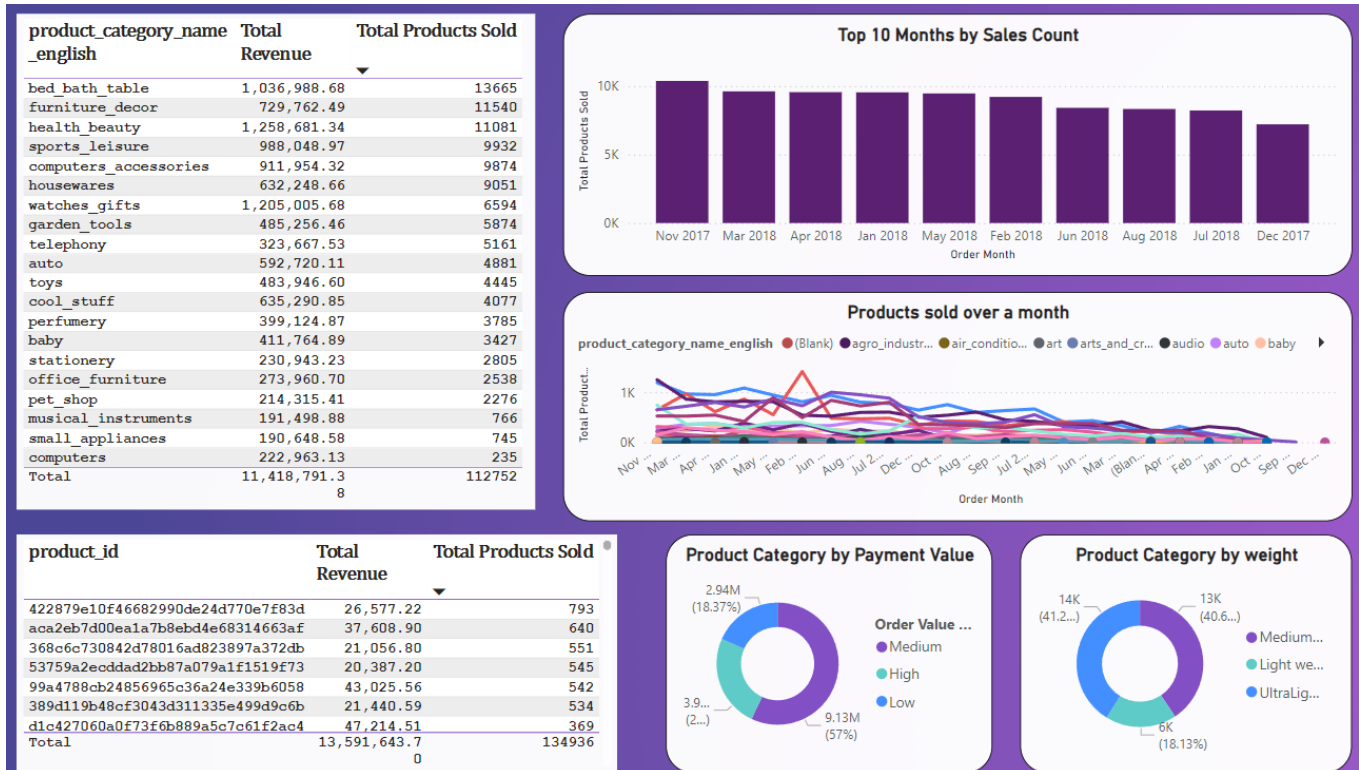| product_id	Total Revenue	Total Products Sold
422879e10f46682990de24d770e7f83d	26,577.22	793
aca2eb7d00ea1a7b8ebd4e68314663af	37,608.90	640
368c6c730842d78016ad823897a372db	21,056.80	551
53759a2ecddad2bb87a079a1f1519f73	20,387.20	545
99a4788cb24856965c36a24e339b6058	43,025.56	542
389d119b48cf3043d311335e499d9c6b	21,440.59	534
d1c427060a0f73f6b889a5c7c61f2ac4	47,214.51	369
Total	13,591,643.70	134936

Table 1: Here we can see (top 10) that the demand of the products by category name. Here we can see that cama_mesa_banho was sold 13665 units and it's the most demanding category of products followed by moveis_decoracao and Beleza_saude by 11540 and 11081 units respectively.

Table 2 : Here we can see that the number of units sold i.e demanded by product_id.

Top 10 Months by sales count: Here we can see that the top 10 months by sales count. Here in the above figure we can see that in November 2017, the sales was on the top.

Products sold over a month : Here we can see that the demand of product over a period of month by product categories.

Product category by payment value: Here we can see that the payment value is distinguished in three parts
low = (less than 100)

Medium = (more than 100 but less than or equal to 500)

High = (more than 501)

Product category by Weight : Here we can see that, I had categorized products by their weight.
Ultralight weight = (upto 500 gram)

Light weight = (from 501 to 999 gram)

Medium weight = (from 1000 grams)

F. Product Reviews Insights

Cards : Here card shows total product sold, Total review, review rate, average review score and review message count.

Revenue by review: Here we can see the total revenue by each rating score.

Reviews over total: Here we can see the same total reviews but in gauge.

Review distribution: Here we can see the distribution of reviews in three different aspects i.e. positive negative and neutral.

Reviews count by year and month: Here we can see the count of reviews given over in each month.

Sales count by review score: Here we can see the total sales count by review score.

Recommendations

- **Improve Delivery Speed**:

  o Concentrate on eliminating delays in regions with lower on-time delivery rates.

- **Boost Product Sales**:

  o Boost marketing for top categories like **health & beauty** and **electronics.**

- **Expand in High-Potential Areas**:

  o Put fund in improved logistics and marketing for regions like **SP and MG** to drive more sales.

- **Encourage High-Value Orders**:

  o Introduce loyalty schemes or discounts to customers placing high-value orders.