Analysis Report: Olist E-Commerce Performance

Project Overview

- **Project Name:** E-COMMERCE SALES PERFORMANCE DASHBOARD – OLIST BRAZIL

- **Objective:** To design an interactive 4-page Power BI dashboard that analyzes Olist's e-commerce sales, profitability, delivery efficiency, and customer satisfaction to support data-driven business decisions.

- **Dataset:** Olist Brazilian E-Commerce Public Dataset (9 CSV files, ~100,000 orders).

Dataset Summary

The dataset consisted of 9 CSV files, providing a complete picture of the e-commerce process, including orders, payments, reviews, customers, products, and sellers.

Key cleaning steps performed in Power Query included:

- Checking data types for all columns, especially date/time fields.

- Assessing key columns (like order_purchase_timestamp) for null values, which was critical for building accurate delivery metrics.

Data Model Overview

Section	Details
Tables Used	orders, order_items, customers, products, sellers, order_payments, order_reviews, geolocation, product_category_name_translation
Relationships	A star-schema-like model was created. orders and order_items serve as the central fact tables. This model is a **Star Schema with minor Snowflake extensions** — often called a **"hybrid schema"**
Key Calculations / Measures	**Total Sales** = SUM(order_items[price]) **Total Freight Cost** = SUM(order_items[freight_value]) **Total Profit** = [Total Sales] - [Total Freight Cost] **Profit Margin %** = DIVIDE([Total Profit], [Total Sales]) **Total Customers** = DISTINCTCOUNT(customers[customer_unique_id]) **Average Review Score** = AVERAGE(order_reviews[review_score]) **Total Validated Deliveries** = CALCULATE(DISTINCTCOUNT(orders[order_id]),orders[order_status] = "delivered",NOT ISBLANK(orders[order_delivered_customer_date])) **On-Time Deliveries** = CALCULATE(COUNTROWS(orders), FILTER(orders, orders[order_delivered_customer_date] <= orders[order_estimated_delivery_date] && orders[order_status] = "delivered" && NOT ISBLANK (orders[order_delivered_customer_date])))

Section	Details
	On-Time Delivery % = DIVIDE([On-Time Deliveries], [Total Validated Deliveries]) **Average Delivery Days** = AVERAGEX(FILTER(orders, orders[order_status] = "delivered" && NOT ISBLANK(orders[order_delivered_customer_date])), DATEDIFF(orders[order_purchase_timestamp], orders[order_delivered_customer_date], DAY))
Notes	The model's accuracy hinges on the Total Validated Deliveries measure, which correctly filters out orders without a valid delivery date. Cross-filter direction was set to "Both" for orders <=> payments and orders <=>order_items to allow filtering from the dimension side.
Diagram	

Analysis & Insights

The 4-page dashboard provided key insights for each target audience.

Page 1: Executive Overview

- **Insight:** The business shows strong sales growth, with sales climbing from 2016 through 2018.

- **Insight:** Sales are highly concentrated geographically. The state of **São Paulo (SP)** is responsible for a significantly larger portion of sales than any other state.

Page 2: Sales Performance

- **Insight:** Product performance is split into two clear types:

  - **High-Value Products:** watches_gifts has the highest *sales* (revenue) but not the highest number of orders.

- o **High-Volume Products:** sports_leisure has the highest *number of orders* (volume) but lower total sales.
- **Insight:** The dashboard's interactivity allows managers to click a state (e.g., "SP") to instantly see the top-selling products and sellers *in that specific state*.

Page 3: Marketing & Customer Insights

- **Insight:** The customer base grew consistently from 2016 to 2018.

- **Insight:** credit_card is the dominant payment method, used in over 76% of all orders. This suggests customers are comfortable with credit, but also presents an opportunity to convert the 24% who use other methods.

- **Insight:** The **"Average Review Score by Category"** chart is a direct guide for marketing, showing clear "winners" (e.g., books, cds_dvds_mus...) to promote and "losers" (e.g., food) to investigate.

Page 4: Operations & Delivery

- **THE KEY INSIGHT:** The dashboard revealed a critical "faster but later" paradox.

  - o **Avg. Delivery Days (Speed):** This has **improved**. Average delivery time dropped from ~20 days in 2016 to ~12 days in 2018.

  - o **On-Time Delivery % (Promise):** This has **worsened**. The on-time rate fell from ~98% to ~90%.

- **Conclusion:** The problem is **not** the delivery speed; the problem is the **delivery estimate**. The company is promising delivery too fast, failing to meet its promise, and creating unhappy customers (as seen in the Avg. Review Score).

- **Insight:** The **"Seller Report Card"** table clearly identifies the specific sellers who are consistently late, have low review scores, and are hurting the platform's reputation.

Conclusions

1. The Olist platform is growing, but this growth is creating operational stress that is damaging customer satisfaction.

2. The single most critical business problem identified is the **inaccuracy of delivery estimates**, which is driving down the on-time delivery rate despite faster actual shipping.

3. A small number of low-performing sellers are responsible for a large share of delivery delays.

Recommendations

1. **Operations: Immediately review and adjust the delivery estimation logic.** It is better to promise delivery in 15 days and deliver in 12 (high satisfaction) than to promise in 10 and deliver in 12 (low satisfaction).

2. **Seller Management:** Use the **"Seller Report Card"** on Page 4 to **review the bottom 10% of sellers**. Provide warnings, retraining, or delist sellers who consistently fail to meet on-time targets.

3. **Marketing:** Use the **"Average Review Score by Category"** chart on Page 3 to guide marketing spend. **Double down on promoting high-rated categories** like books and watches_gifts and stop promoting low-rated categories until their quality/fulfillment issues are resolved.

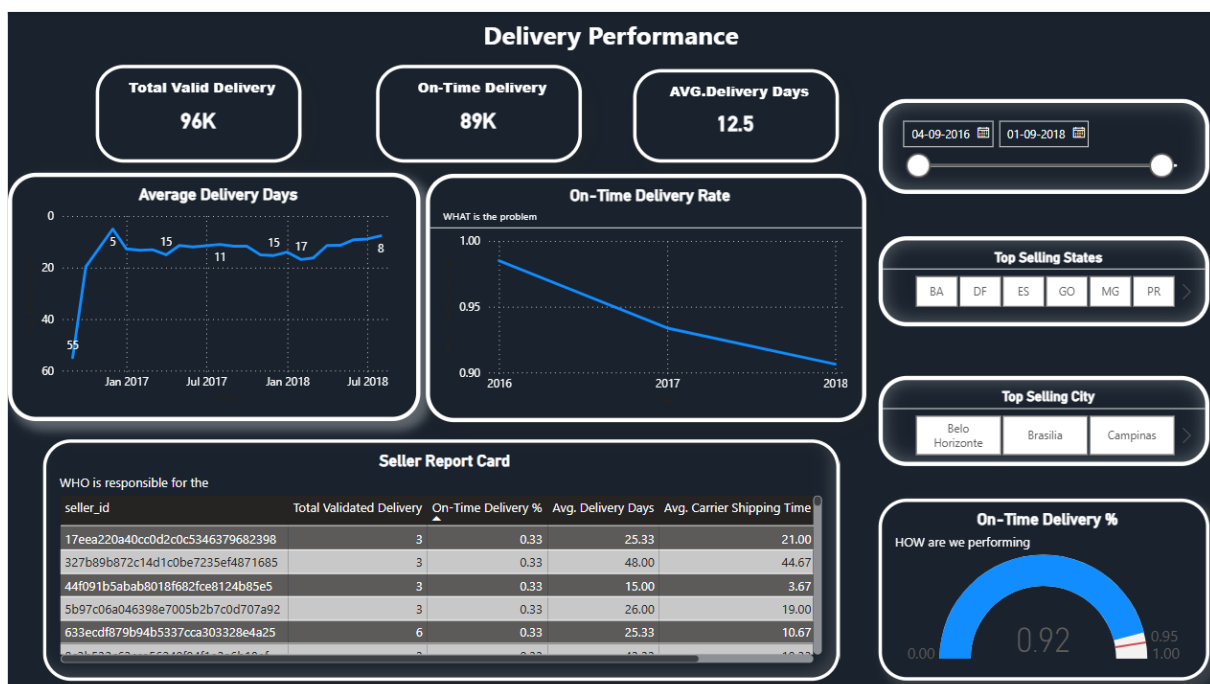**Dashboard Overview**

- Page 1: Executive Overview

- Page 2: Sales Performance

- Page 3: Marketing & Customer Insights

- Page 4: Operations & Delivery

Notes / Limitations

- **Profit Definition:** "Profit" is calculated as Total Sales - Total Freight Cost Since the dataset does **not include product cost** (the cost of making or buying each product), I can't calculate *true profit*.
  So instead, a **simplified version**:Profit = Total Sales − Total Freight Cost

- **Data Accuracy:** All delivery metrics are based only on confirmed deliveries (with actual delivery dates). This ensures accuracy and avoids counting incomplete or missing data.