Brazilian E-Commerce Analysis

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A SQL-Driven Project

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Introduction

Goal: Use SQL to extract business insights from Brazilian E-commerce data

Tools: SQL(PostgreSQL), Excel(Pivot Tables,Charts,Slicers,Maps)

Focus: Sales trends, customer behavior, delivery efficiency

Deliverable: Interactive Dashboard
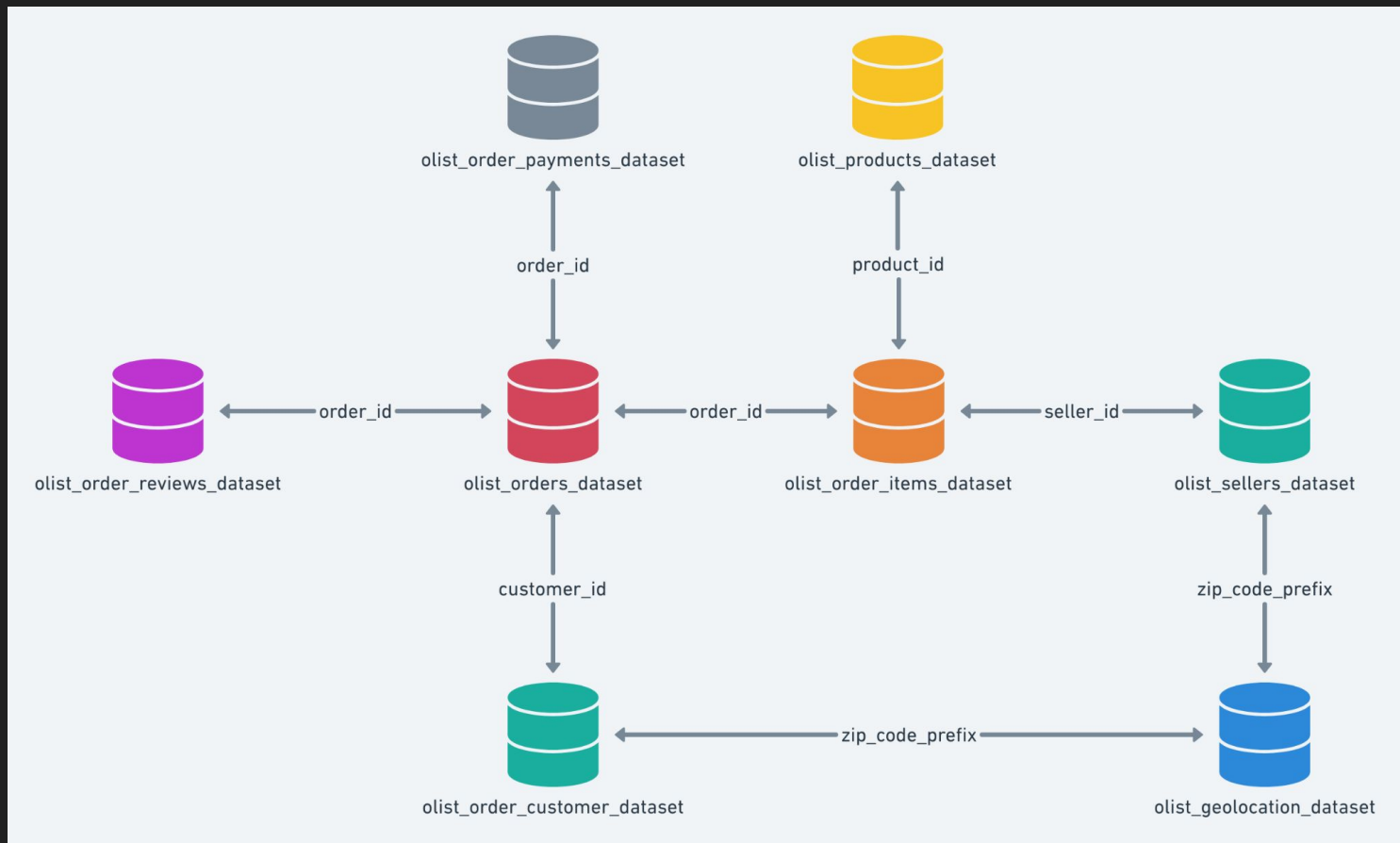
Overview of Dataset

Source: Brazilian E-Commerce Public Dataset by Olist rom

Kaggle - https://www.kaggle.com/datasets/olistbr/brazilian-ecommerce/data

Tables Used: Orders, Order_items, Order_payments, Order_reviews, Products, Product_category_name_translation, Customers

- 100,000 Orders , 9,900+ Customers

Database Schema

Monthly Revenue Trend by Category

Query

```sql
SELECT   DATE_TRUNC('month', order_purchase_timestamp) AS month_start,
         pt.product_category_name_english AS product_category,
         SUM(op.payment_value) AS total_revenue
FROM order_payments op
JOIN orders o USING(order_id)
JOIN order_items oi USING(order_id)
JOIN products p USING(product_id)
JOIN product_category_name_translation pt USING (product_category_name)
GROUP BY month_start,pt.product_category_name_english;
```

Results

|	month_start timestamp without time zone	product_category text	total_revenue numeric
1	2016-09-01 00:00:00	furniture_decor	272.46
2	2016-09-01 00:00:00	telephony	75.06
3	2016-10-01 00:00:00	air_conditioning	4675.43
4	2016-10-01 00:00:00	audio	183.03
5	2016-10-01 00:00:00	auto	2716.70
6	2016-10-01 00:00:00	baby	2344.43
7	2016-10-01 00:00:00	bed_bath_table	2291.71

Monthly Revenue Trend by Category

This line chart shows how monthly revenue varies across different product categories. We can change the specific product data by using the slicer.

Month Start	Product Category	Total Revenue
9/1/2016 0:00	furniture_decor	272.46
9/1/2016 0:00	telephony	75.06
10/1/2016 0:00	air_conditioning	4675.43
10/1/2016 0:00	audio	183.03
10/1/2016 0:00	auto	2716.7
10/1/2016 0:00	baby	2344.43
10/1/2016 0:00	bed_bath_table	2291.71
10/1/2016 0:00	books_general_intere	144.54

Row Labels	Sum of Total Revenue
⊞ Jan	$ 1,560,457.15
⊞ Feb	$ 1,621,267.33
⊞ Mar	$ 1,969,000.51
⊞ Apr	$ 1,979,651.83
⊞ May	$ 2,209,574.20
⊞ Jun	$ 1,886,683.97
⊞ Jul	$ 2,075,882.42
⊞ Aug	$ 2,086,345.67
⊞ Sep	$ 1,005,690.93
⊞ Oct	$ 1,065,750.16
⊞ Nov	$ 1,565,721.40
⊞ Dec	$ 1,022,797.35
Grand Total	$ 20,048,822.92

Sum of Total Revenue

Total Revenue By Month

Months (Month Start) ▼   Month Start ▼

Product Category

- agro_industry_and_commerce
- air_conditioning
- art
- arts_and_craftmanship
- audio
- auto
- baby
- bed_bath_table

Monthly Revenue for Garden Tools

This chart focuses specifically on the Garden Tools category. There is a strong spike in August. This may be due to seasonal demand or a promotion.
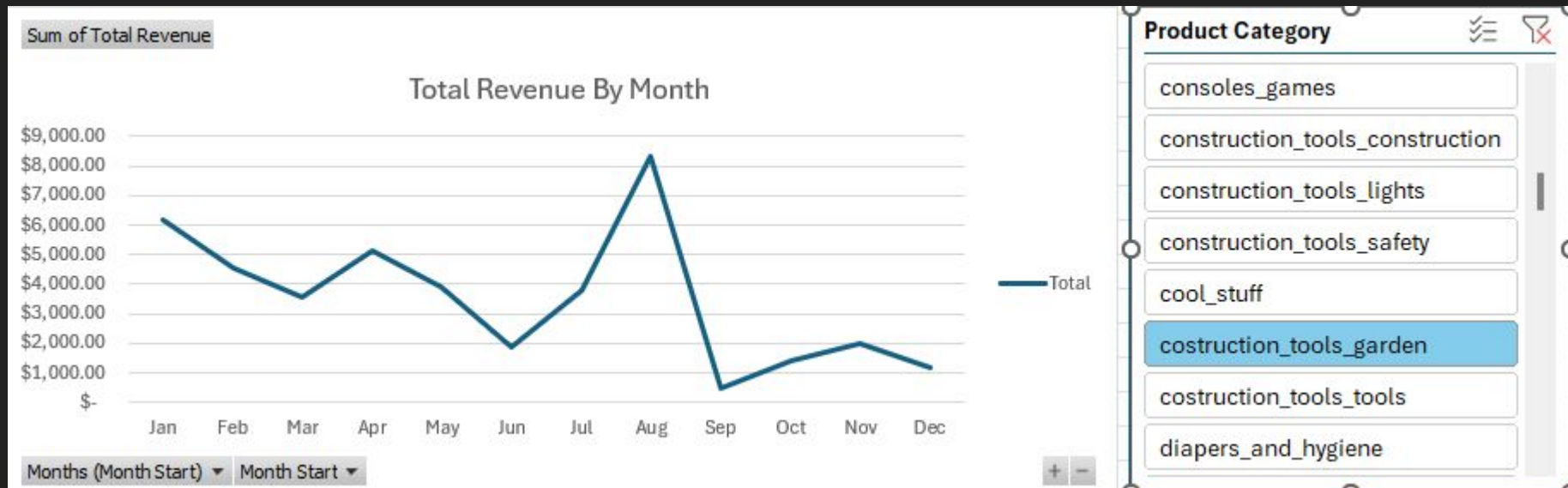
Top 5 Cities By Revenue

Query

```
SELECT c.customer_city AS customer_city,
       SUM(op.payment_value) AS total_revenue FROM customers c
JOIN orders o USING (customer_id)
JOIN order_payments op USING (order_id)
GROUP BY c.customer_city
ORDER BY total_revenue DESC
LIMIT 5;
```

These cities make up 48% of Total Revenue

Results

	customer_city text	total_revenue numeric
1	sao paulo	2203373.09
2	rio de janeiro	1161927.36
3	belo horizonte	421765.12
4	brasilia	354216.78
5	curitiba	247392.48

Top 5 Cities by Revenue

This bar chart highlights the top 5 cities contributing the most to overall revenue. They represent a major portion of sales and could be priorities for campaigns

Customer City	Total Revenue
Sao Paulo	2,203,373.09
Rio De Janeiro	1,161,927.36
Belo Horizonte	421,765.12
Brasilia	354,216.78
Curitiba	247,392.48

Top 5 Cities by Revenue

Best Selling Products

Query

```sql
1   SELECT  pt.product_category_name_english AS Product_Category,
2       SUM(payment_value) AS total_revenue FROM order_payments op
3   JOIN orders o USING (order_id)
4   JOIN order_items USING (order_id)
5   JOIN products p USING (product_id)
6   JOIN product_category_name_translation pt USING (product_category_name)
7   GROUP BY pt.product_category_name_english
8   ORDER BY total_revenue DESC
9   LIMIT 5;
```

Results

	product_category text	total_revenue numeric
1	bed_bath_table	1712553.67
2	health_beauty	1657373.12
3	computers_accessories	1585330.45
4	furniture_decor	1430176.39
5	watches_gifts	1429216.68

Best Selling Products

This chart shows the highest selling products in the dataset

Product Category	Total Revenue
Bed,Bath, &Table	1712553.67
Health & Beauty	1657373.12
Computer Accessories	1585330.45
Furniture & Décor	1430176.39
Watches & Gifts	1429216.68

Best Selling Products
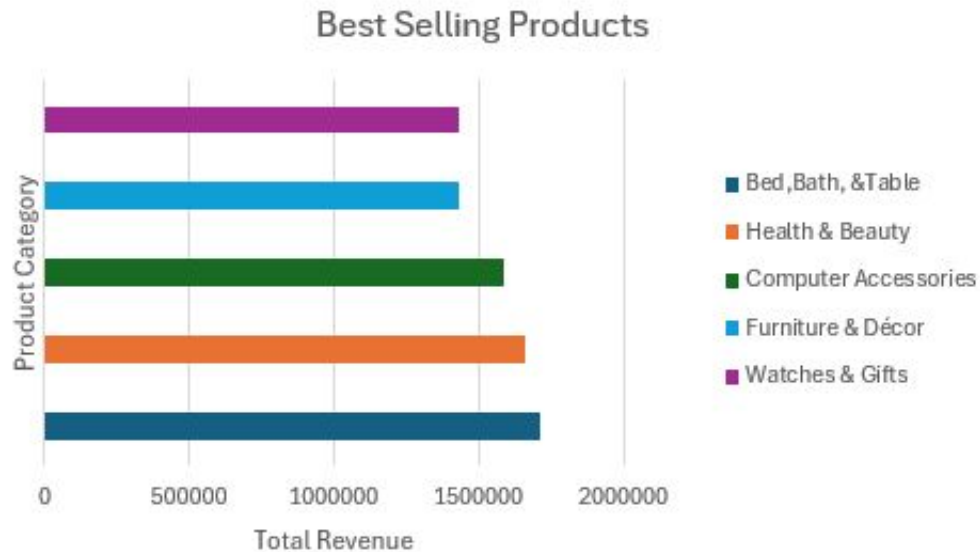
Delivery Performance by Region

Query

```sql
SELECT c.customer_state AS region,
       ROUND(AVG(EXTRACT(EPOCH FROM order_delivered_customer_date - order_approved_at) / 86400), 1) AS delivery_days FROM customers c
JOIN orders o USING (customer_id)
GROUP BY region;
```
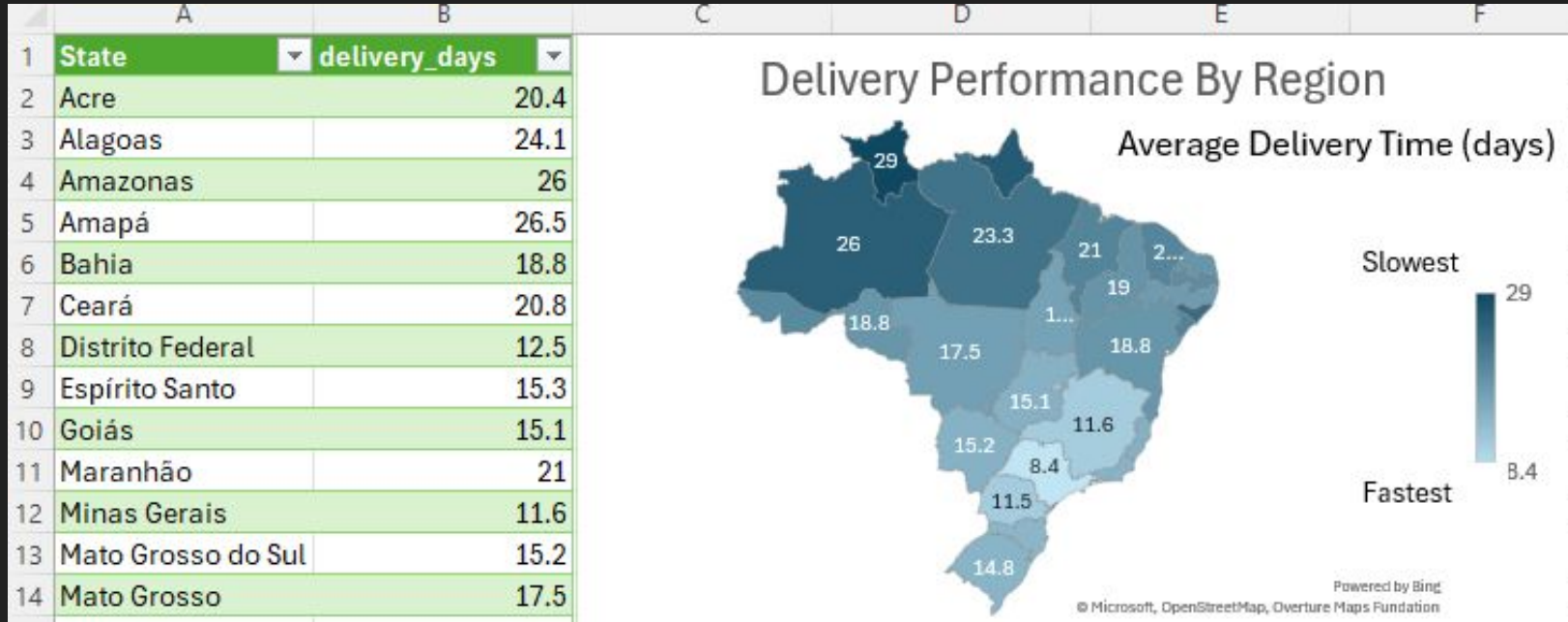
Result

	region text	delivery_days numeric
1	AC	20.4
2	AL	24.1
3	AM	26.0
4	AP	26.5
5	BA	18.8
6	CE	20.8

Delivery Performance by Region

This map shows how delivery times vary by region. Regions with longer average delivery times could signal areas for improvement.

	A	B
1	**State**	**delivery_days**
2	Acre	20.4
3	Alagoas	24.1
4	Amazonas	26
5	Amapá	26.5
6	Bahia	18.8
7	Ceará	20.8
8	Distrito Federal	12.5
9	Espírito Santo	15.3
10	Goiás	15.1
11	Maranhão	21
12	Minas Gerais	11.6
13	Mato Grosso do Sul	15.2
14	Mato Grosso	17.5

Delivery Performance By Region

Average Delivery Time (days)

29
26 23.3 21 2...
19
18.8 1...
17.5 18.8
15.1
11.6
15.2 8.4
11.5
14.8

Slowest
29

Fastest
8.4

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Dashboard
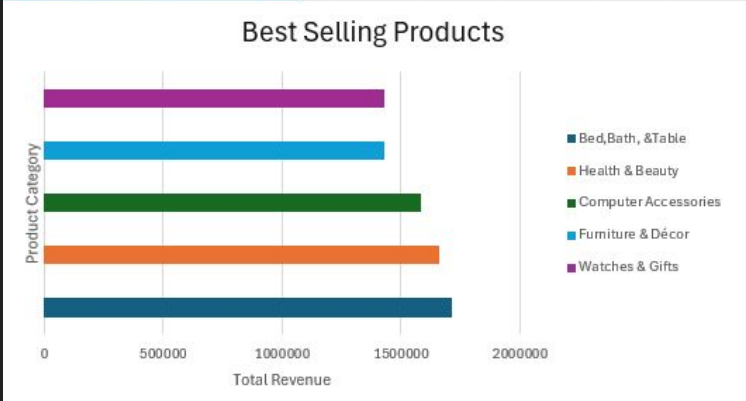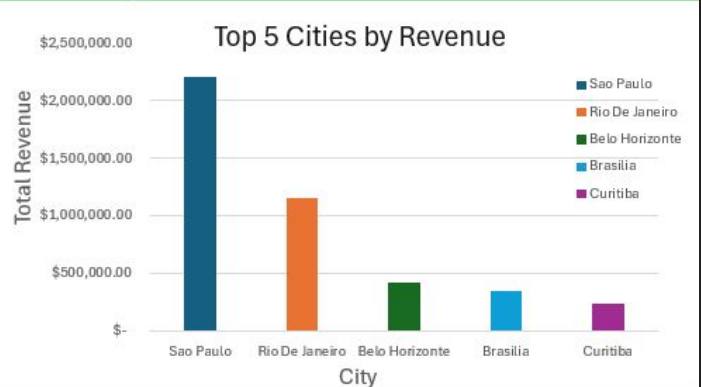
Key Insights Summary

- Revenue by category shows seasonal trends. This helps with timing promotions.
- The top 5 cities make up 48 percent of revenue. These regions are key for focused marketing.
- The top-selling product categories suggest customers prioritize home comfort, self-care, and tech. These areas could be key for future product expansion or targeted advertising.
- Delivery times differ by region. Some areas may need more support like Roraima.

Reflection

- Learned to structure efficient SQL queries across multiple tables

- Gained insight into real business KPIs using raw transactional data

- Practiced turning SQL output into interactive, visual reports