PROJECT:

DELIVERY PERFORMANCE ANALYSIS

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INTRODUCTION

kaggle

In today's fast-paced e-commerce landscape, efficient delivery operations are crucial. This project, "**Delivery Performance Analysis**," aims to optimize delivery processes in Brazil by **analyzing** and **improving** food and goods delivery operations. By identifying and addressing inefficiencies,

The project leverages the "**Delivery Center: Food & Goods orders in Brazil**" dataset from Kaggle. This dataset, used solely for educational and reference purposes, provides detailed information on various aspects of delivery operations, such as delivery times, driver data, order statuses, and associated costs. The data is processed and cleaned using **Python** in a **Google Colab** environment to ensure high-quality, ready-to-analyze data. After preprocessing, the data is imported into **Power BI** for visualization and further analysis, enabling insights into delivery efficiency, customer satisfaction, and operational bottlenecks. This process provides actionable recommendations to improve delivery strategies and operational efficiency in the Brazilian market.

Link Kaggle: https://www.kaggle.com/datasets/nosbielcs/brazilian-delivery-center

LINK COLAB

DATA PREPROCESSING

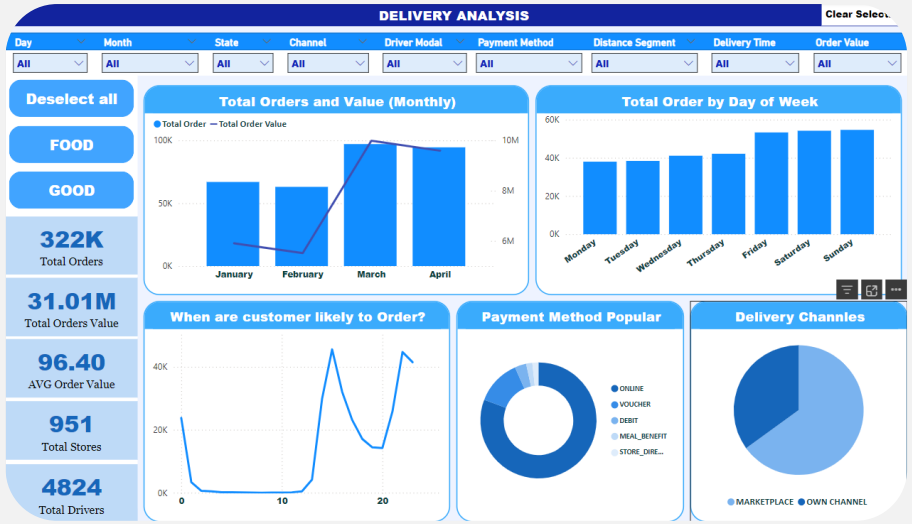
To efficiently process and analyze a massive dataset of over **370,000 rows**, I leveraged the power of **Python** and **Google Colab**. Python's efficiency and the robust **Pandas** library streamlined **data manipulation and analysis**.

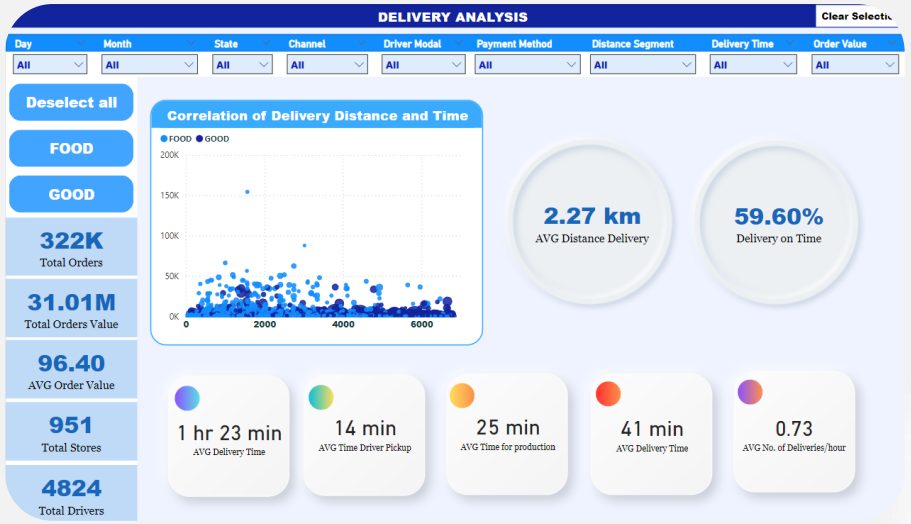
The preprocessing workflow involved several critical steps. I began by **exploring** and i**nspecting** the data to understand its structure, identify **missing values** and **outliers**, and ensure consistency. To address missing data, I employed techniques like dropping incomplete rows and **replacing null** values with appropriate substitutes, such as the **mean**, **zero**, or **mode**. Additionally, I **merged** related tables to handle null values more effectively and retain only valid data. **Outliers** were managed using the **IQR** method to remove unreasonable values.

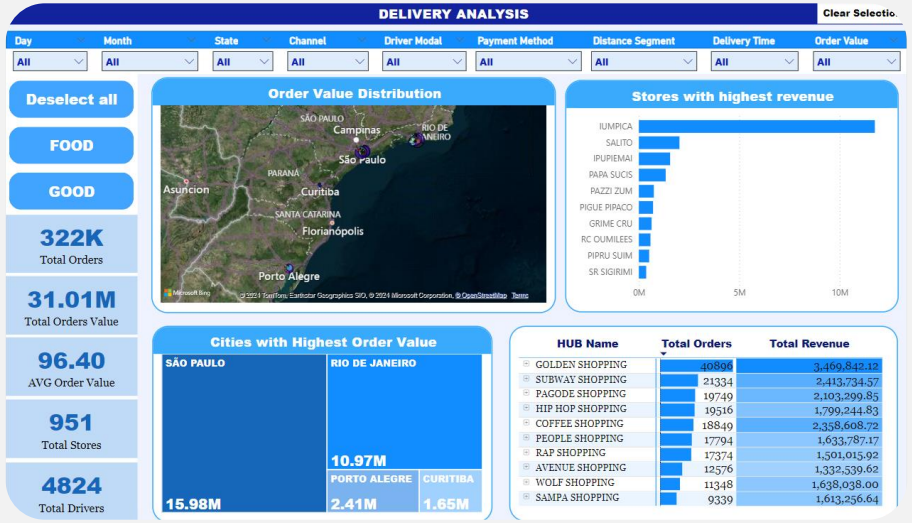
Finally, I prepared the dataset for analysis by resetting indices and ensuring it was clean, consistent, and optimized.

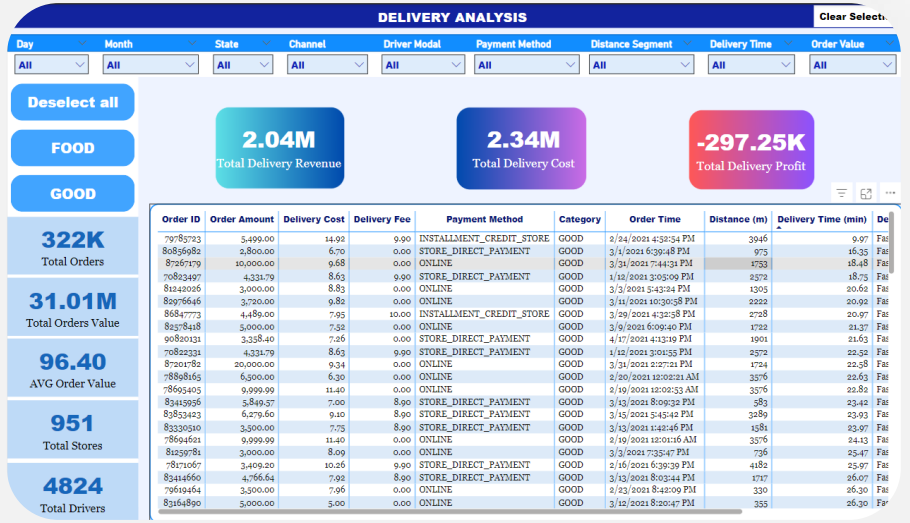
By following these steps, I was able to transform the raw data into a suitable format for **visualization** and **analysis** in **Power BI.**

DATA VISUALIZATION

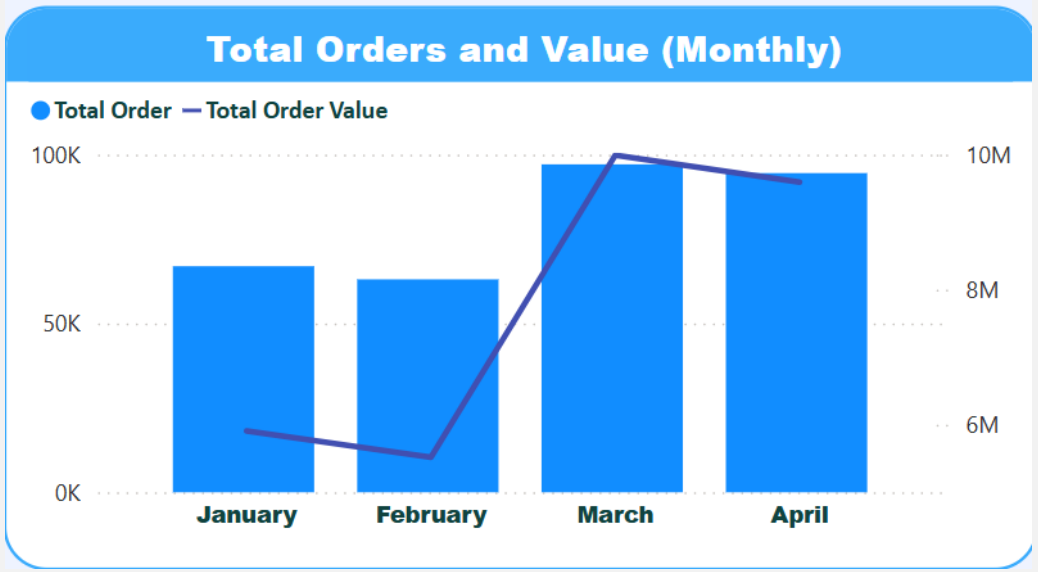








[LINK TO DASHBOARD]



INSIGHT

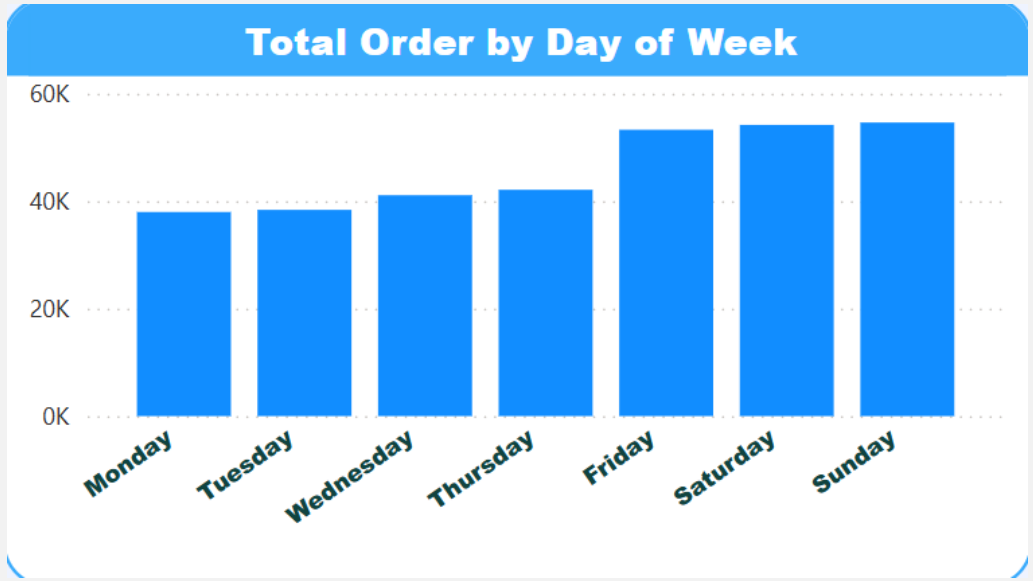
This KPI shows the total number of orders and total order value for each month from **January** to **April**. It provides valuable insight into consumer purchasing behavior and trends across different months. By understanding these patterns, the business can better plan for seasonal fluctuations in demand and tailor strategies to optimize sales.

ANALYSIS

Based on the chart data, we can observe that the total number of orders and the total order value **peak** in **March** and dip to the **lowest** in **February**. In the first two months of the year, consumers tend to spend less due to the high expenses in **December** with major holidays like **Christmas** and **New Year**, as well as significant promotional campaigns. In **March** and **April,** consumers begin to resume spending for themselves and their families, preparing for the upcoming summer vacation plans.

RECOMMENDATIONS

Stimulate demand in slow months: Use discounts, post-holiday promotions, and loyalty rewards.
Optimize labor costs: Adjust staffing during low-demand months.
Prepare for peak seasons: Ensure sufficient inventory and resources for high-demand months.



INSIGHT:

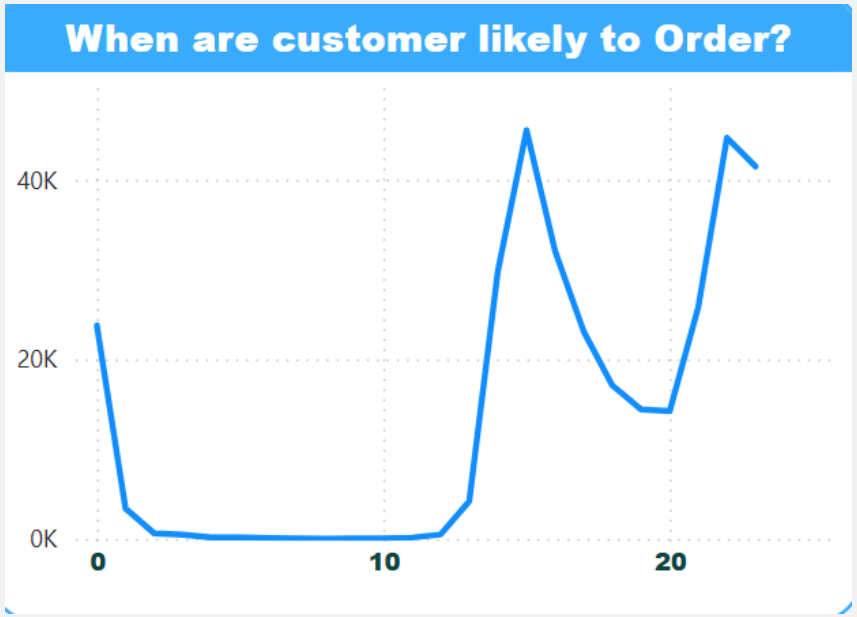
This KPI shows the total number of orders placed on each day of the week.

ANALYSIS:

The highest number of orders occurs on **weekends** (Friday, Saturday, and Sunday), with **Friday** leading at orders .This indicates customers have more free time, preparing for the **weekend** or taking advantage of promotions. Early in the week, orders are lower as customers focus on work, but the order volume starts increasing from **Thursday** onward, possibly as they plan for the **weekend.**

RECOMMENDATIONS:

Promote early-week sales: Offer special deals and mini-game events to engage customers.
Adjust staffing: Increase staff on weekends and optimize for early in the week to reduce costs.
Plan weekend promotions: Boost marketing and operational support (order handling, customer service, and delivery) during peak weekend days to ensure quick service and avoid delays.



INSIGHT:

This KPI shows the specific times of day when customers tend to place the most orders.

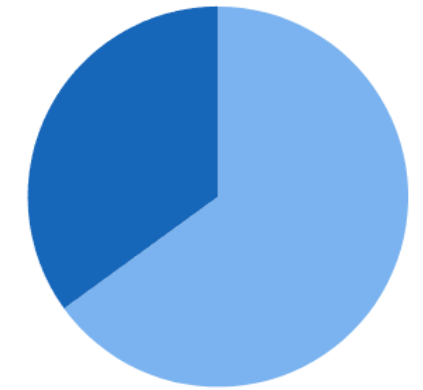
ANALYSIS:

Customers place the most orders during two **peak times: 3 PM** and **10 PM**. These times likely align with when customers have most **free time** — either **after work** or during **evening relaxation**. Additionally, evening hours often feature more **promotions, vouchers, and sales, encouraging shopping.**

RECOMMENDATIONS:

Target peak hours: Use flash sales and promotions between 8 PM and midnight to drive sales during these high-demand periods.
Optimize staffing: Ensure sufficient staff during peak hours and streamline delivery processes to meet customer expectations.
Encourage off-peak shopping: Create incentives for customers to shop during lower-demand times to balance order distribution.

Delivery Channles



DELIVERY

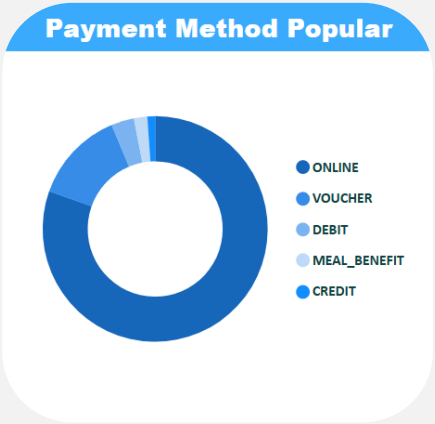
ANALYSIS:

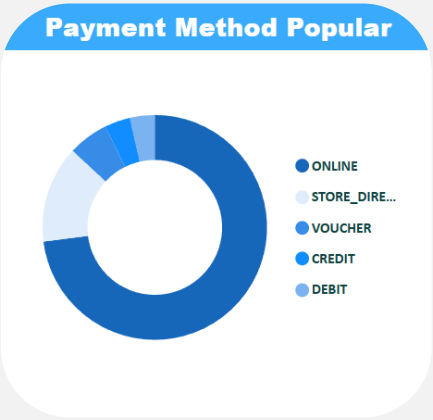
The **Marketplace** channel accounts for **65%** of total orders, indicating that 65% of the company's sales come from intermediary platforms. The **Own Channel** contributes **35%** of total orders. This suggests that while the company relies heavily on third-party platforms for distribution, it still retains a notable portion of sales through its own direct channel.

RECOMMENDATIONS:

Develop or partner with reliable distribution platforms: Strengthen the Own Channel by either developing it internally or collaborating with trusted partners.

Create exclusive advantages for Own Channel: Offer exclusive products, discounts, or services to customers who order through the direct platform to boost its market share.





ANALYSIS:

The chart shows that online payment methods dominate, accounting for 80.4% of food orders and 77.21% of goods orders, indicating a strong preference for these methods, which are becoming the dominant trend in the delivery industry.

- **For food** : Vouchers (13.39%) are the second most popular payment method, suggesting that promotional programs via vouchers are effective.
- **For goods**: Store direct payments (13.08%) indicate that a significant number of customers still prefer to shop and pay directly at the store. Voucher usage is low (4.32%) but can still be leveraged to enhance customer loyalty.

Other payment methods, such as Debit and Credit cards, account for a very small proportion, indicating that these are not preferred by customers.

RECOMMENDATIONS:

Develop online payment methods: Ensure smooth, easy, and fast payment processes for customers. Integrate popular payment services to expand market reach.
Expand potential payment methods:
Vouchers: Build a loyalty program and promote voucher offers to encourage repeat customers.
Store direct payments: Ensure quick and simple payment processes in-store and offer incentives for customers who pay directly.
Benefit meal: Consider partnerships with companies to integrate this payment method into employee benefit programs.

1 hr 23 min
AVG Delivery Time

14 min
AVG Time Driver Pickup

25 min
AVG Time for production

41 min
AVG Delivery Time

0.73
AVG No. of Deliveries/hour

ANALYSIS:

The average delivery time from when a customer places an order to when they receive the product is **1 hour and 23 minutes**, which could **negatively** impact customer experience if perceived as **too long**.

Preparation time: The average time from when the business receives an order until the product is ready for delivery is approximately **25 minutes.**

Pickup time: Each driver spends about **14 minutes** to reach the pickup location after receiving an order.

Delivery time: Drivers spend around **41 minutes** to complete a delivery from pickup to customer delivery.

Efficiency: Each driver completes about **73%** of a delivery within one hour, meaning it takes roughly **1.36 hours** to complete one full delivery cycle. This indicates relatively low delivery efficiency.

1 hr 23 min
AVG Delivery Time

14 min
AVG Time Driver Pickup

25 min
AVG Time for production

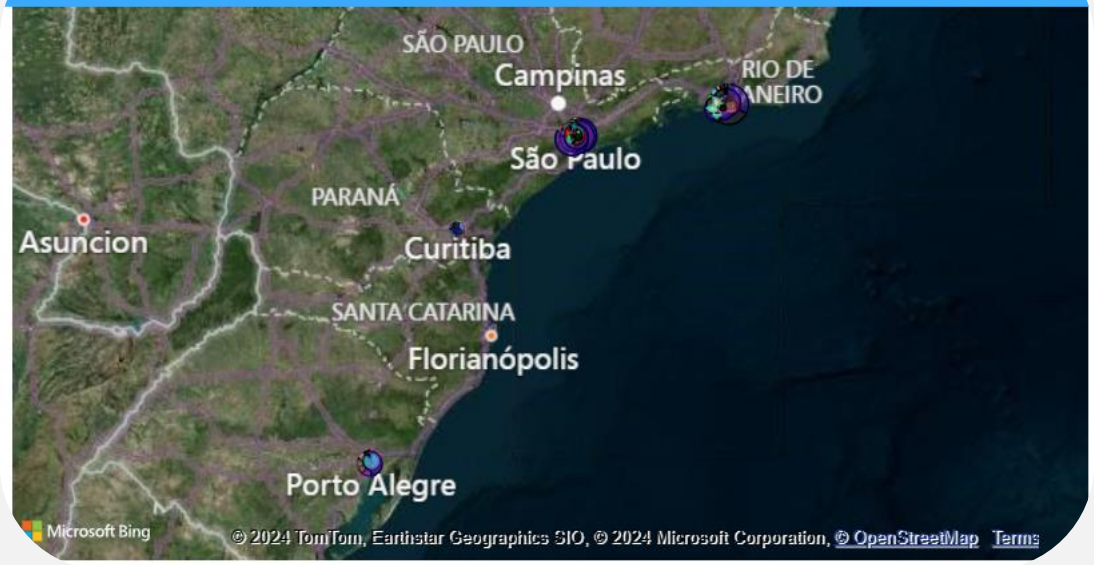
41 min
AVG Delivery Time

0.73
AVG No. of Deliveries/hour

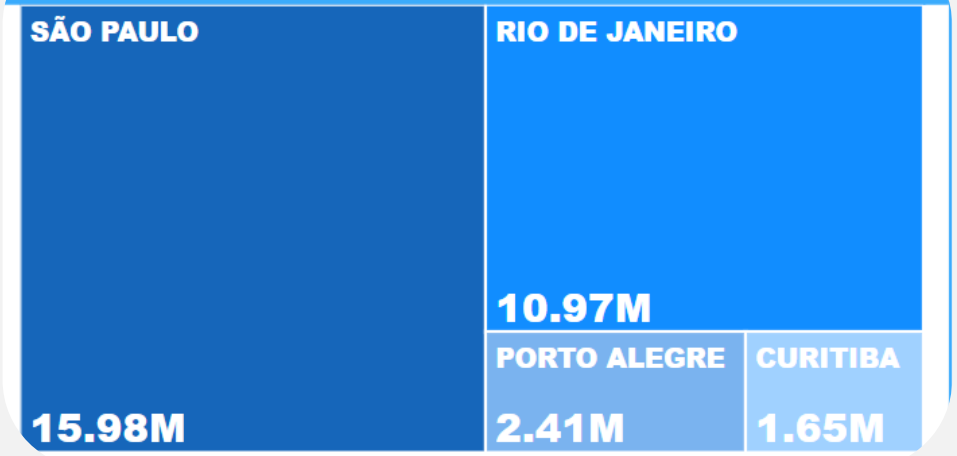
RECOMMENDATION

Optimize order processing: Streamline and **automate** the ordering system to save time and improve efficiency.
Improve delivery processes:
Increase the **number of drivers** and **assign** them **efficiently** to different areas to reduce delivery time.
Utilize GPS technology and route optimization to ensure drivers take the fastest and shortest routes, **avoiding traffic** and **delays.**
Driver training: Train drivers on selecting optimal **routes, handling road situations,** and improving customer communication to enhance customer satisfaction during longer wait times.
Incentivize drivers: Implement a **reward system** for drivers based on **fast** and on-time deliveries to **motivate** them to work more efficiently

Order Value Distribution



Cities with Highest Order Value



ANALYSIS:

The cities **Sao Paulo** and **Rio de Janeiro** have the **highest** concentration of stores with high sales figures. These two major cities in Brazil are considered the country's most developed urban areas, with large, modern populations and thriving economic and trade activities.

RECOMMENDATIONS:

For stores in Sao Paulo and Rio de Janeiro: Focus on **retaining** current customers and investing resources in **acquiring** potential new customers in these cities.

For stores in Porto Alegre and Curitiba: Conduct research to develop products and services that appeal to local consumers and **expand** the business to surrounding areas to drive growth.

CONCLUSION

Project Summary:
My analysis of the provided dataset yielded valuable insights into **customer behavior**, **order patterns**, **delivery performance**, and **payment preferences**. We identified key **trends**, such as **peak order times**, **popular payment methods**, and **areas for delivery optimization**. By leveraging Power BI, we transformed raw data into actionable insights to guide future strategic decisions.

Key Takeaways
Customer Behavior: Understanding peak order times and popular payment methods allows for targeted marketing and optimized operations.
Delivery Performance: Improving delivery efficiency can enhance customer satisfaction and reduce costs.
Payment Preferences: Prioritizing popular payment methods aligns with customer expectations and market trends.

Next Steps
Strategic Marketing: Implement targeted campaigns during peak periods to maximize sales.
Delivery Optimization: Enhance delivery processes by optimizing routes and increasing driver efficiency.
Payment Options: Continue developing and integrating new payment methods.

By implementing these data-driven strategies, the business can drive growth, **improve customer satisfaction**, and **increase operational efficiency.**

THANKS