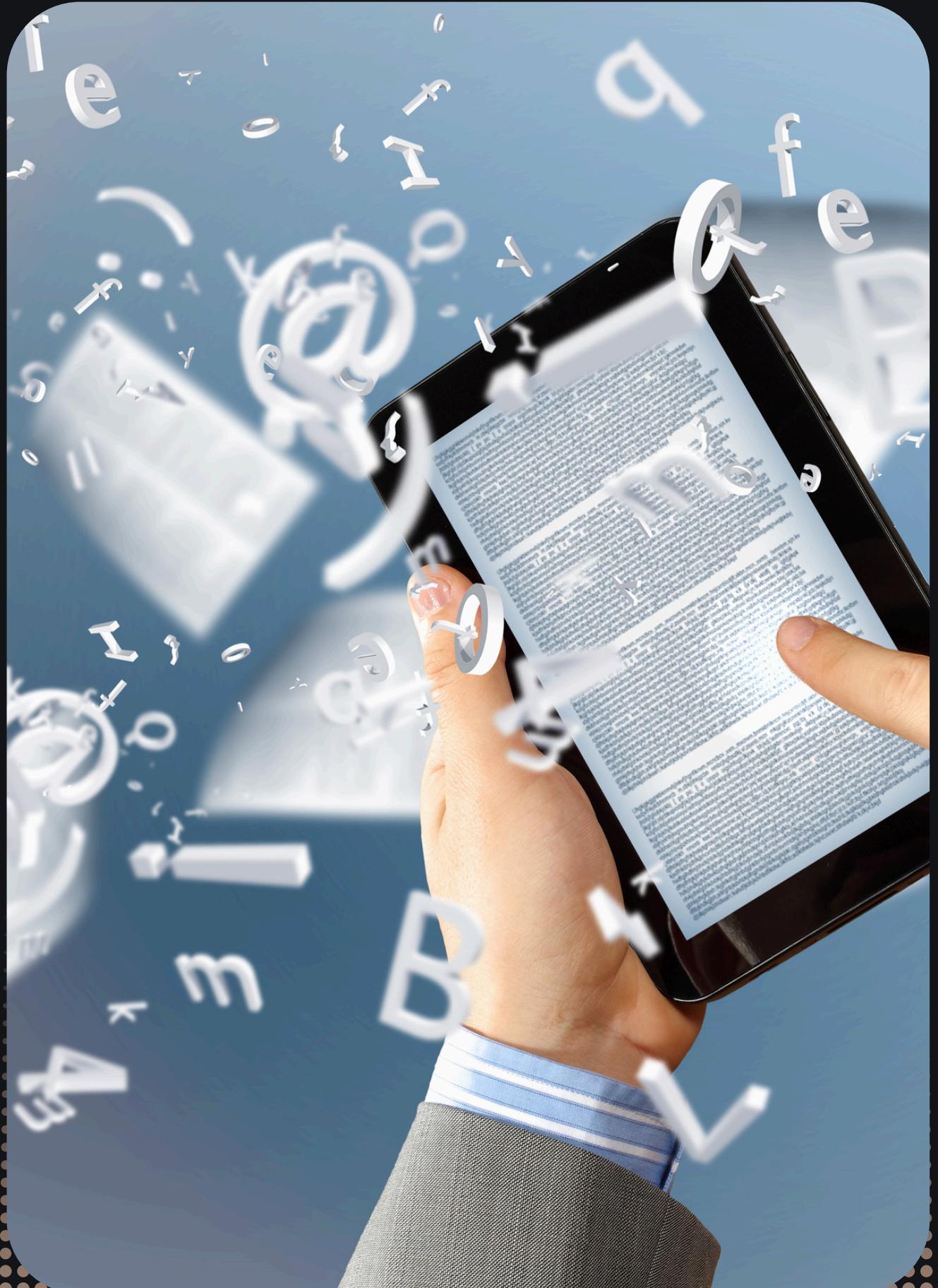


E-Commerce Analytics: Customer Behavior and Business Performance

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Discussing trends and future opportunities





Current E-Commerce Trends

E-commerce continues to grow rapidly, driven by **shifting consumer behaviors** and technological advancements.

Introduction

This project analyzes a comprehensive e-commerce dataset from Kaggle to uncover insights about:

01 Customer purchasing behavior

02 Order fulfillment efficiency

03 Payment preferences

04 Product performance

05 Geographic and seasonal patterns

01 What are the key factors that influence customer purchase behavior and order value?

02 How efficient is the order fulfillment process, and what impacts delivery performance?

03 Which payment methods is the most impactful in business growth?

04 Which product categories drive the highest revenue?

05 How do seasonal trends affect order volumes and customer acquisition?

Scope Data Analytics Project

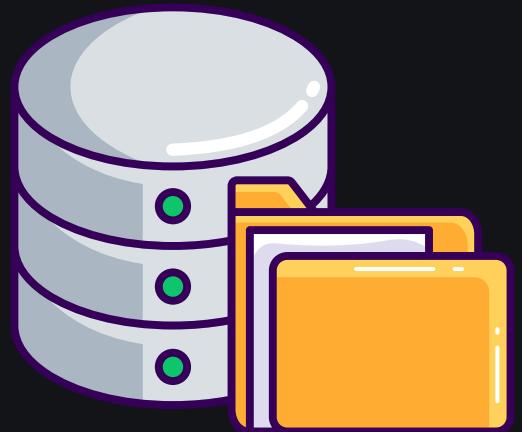
Goal :

Provide actionable recommendations for improving customer satisfaction, optimizing delivery, and maximizing revenue growth.

Sources of Data



Dataset Overview



Dataset from Kaggle E-commerce Database

Tables used:

- Orders (**timestamps, status**)
- Order Items (**price, shipping, product_id**)
- Customers (**city, state, zip**)
- Payments (**type, installments, value**)
- Products (**category, dimensions, weight**)

- Orders: ~99k rows
- Customers: ~100k rows
- Order Items: ~112k rows
- Products: ~3.7k rows (cleaned & deduplicated)
- Payments: ~103k rows

Period Covered: Sep 2016 - Sep 2018

Total Period: ~2 years

Dataset Variable Definitions

orders		order_items		customers	
Variable	Definition	Variable	Definition	Variable	Definition
order_id	Unique identifier for an order, acting as the primary key.	order_id	Unique identifier for an order.	customer_id	Unique identifier for a customer, acting as the primary key.
customer_id	Unique identifier for a customer. This table may not be unique at this level.	order_item_id	Item number in each order, acting as part of the primary key along with the order_id.	customer_zip_code_prefix	Customer's Zip code.
order_status	Indicates the status of an order (e.g.,delivered,cancelled,processing, etc.).	product_id	Unique identifier for a product.	customer_city	Customer's city.
order_purchase_timestamp	Timestamp when the order was made by the customer.	seller_id	Unique identifier for the seller.	customer_state	Customer's state.
order_approved_at	Timestamp when the order was approved from the seller's side.	price	Selling price of the product.		
order_delivered_timestamp	Timestamp when the order was delivered at the customer's location.	shipping_charges	Charges associated with the shipping of the product.		
order_estimated_delivery_date	Estimated date of delivery shared with the customer while placing the order.				

Dataset Variable Definitions

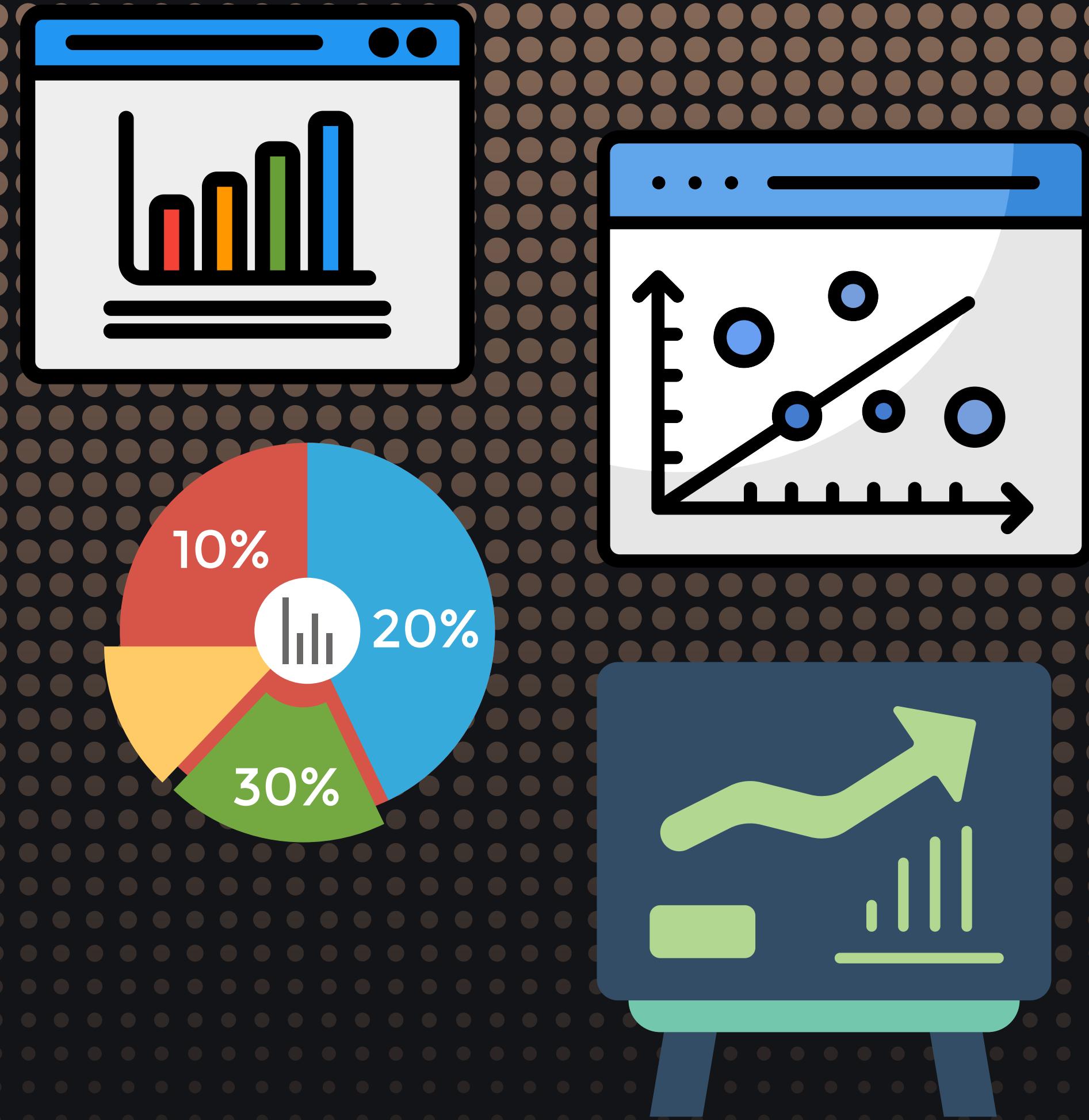
payments

Variable	Definition
order_id	Unique identifier for an order.
payment_sequential	Provides information about the sequence of payments for the given order.
payment_type	Type of payment (e.g., credit_card, debit_card, etc.).
payment_installments	Payment installment number in case of credit cards.
payment_value	Transaction value.

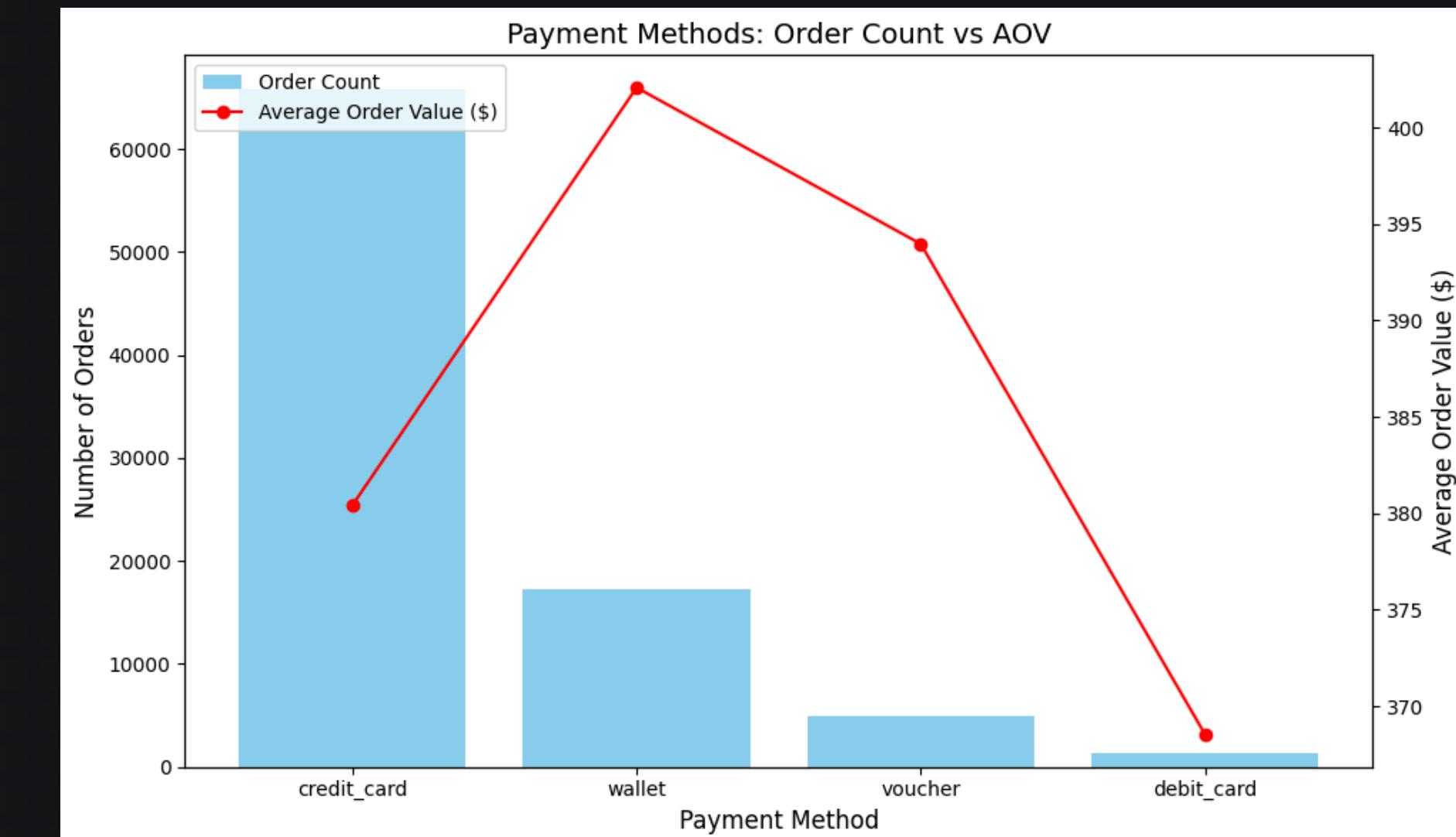
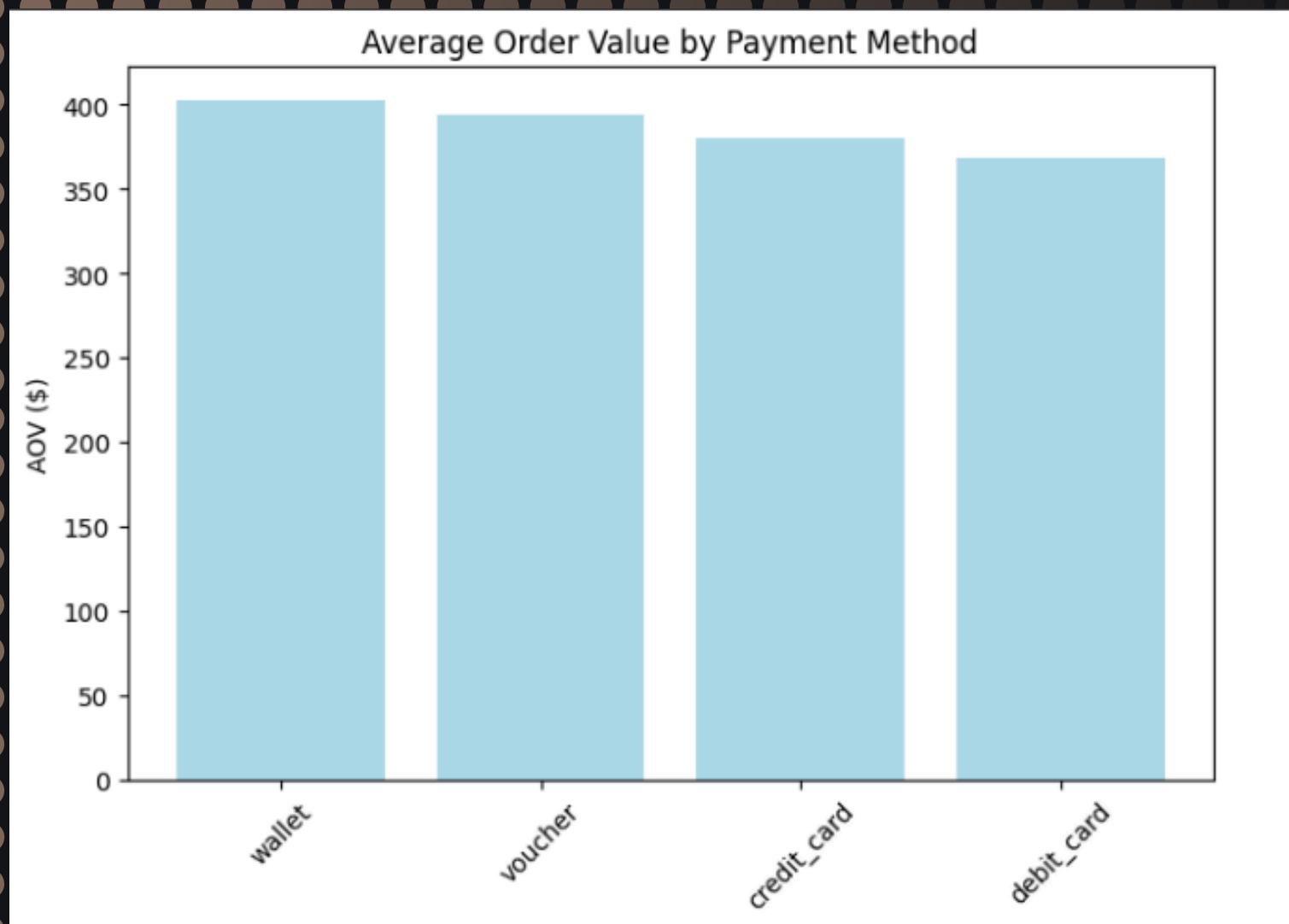
products

Variable	Definition
product_id	Unique identifier for each product, acting as the primary key.
product_category_name	Name of the category the product belongs to.
product_weight_g	Product weight in grams.
product_length_cm	Product length in centimeters.
product_height_cm	Product height in centimeters.
product_width_cm	Product width in centimeters.

Charts & Insights



What are the key factors that influence customer purchase behavior and order value?

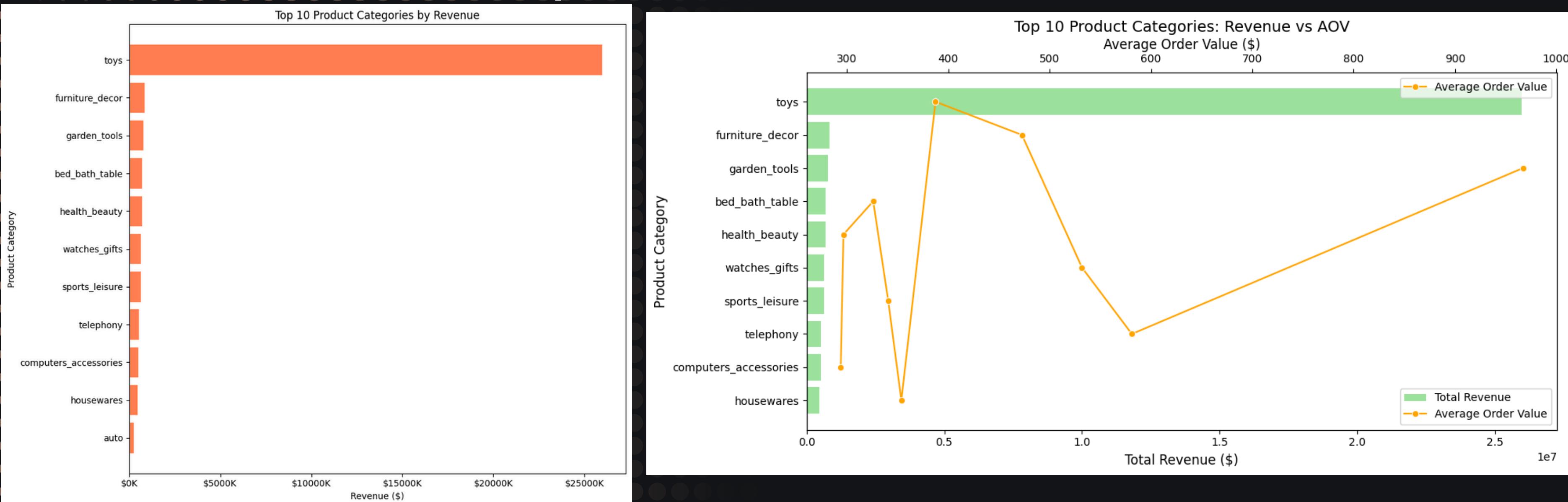


KEY FACTORS INFLUENCING PURCHASE BEHAVIOR:

Payment Insights :

- **Wallet** users show **the highest AOV** (\$402.08), but they represent only a small share of total orders.
- **Credit card payments dominate in both** order volume and total revenue, making them **the most impactful** for business growth.

What are the key factors that influence customer purchase behavior and order value?



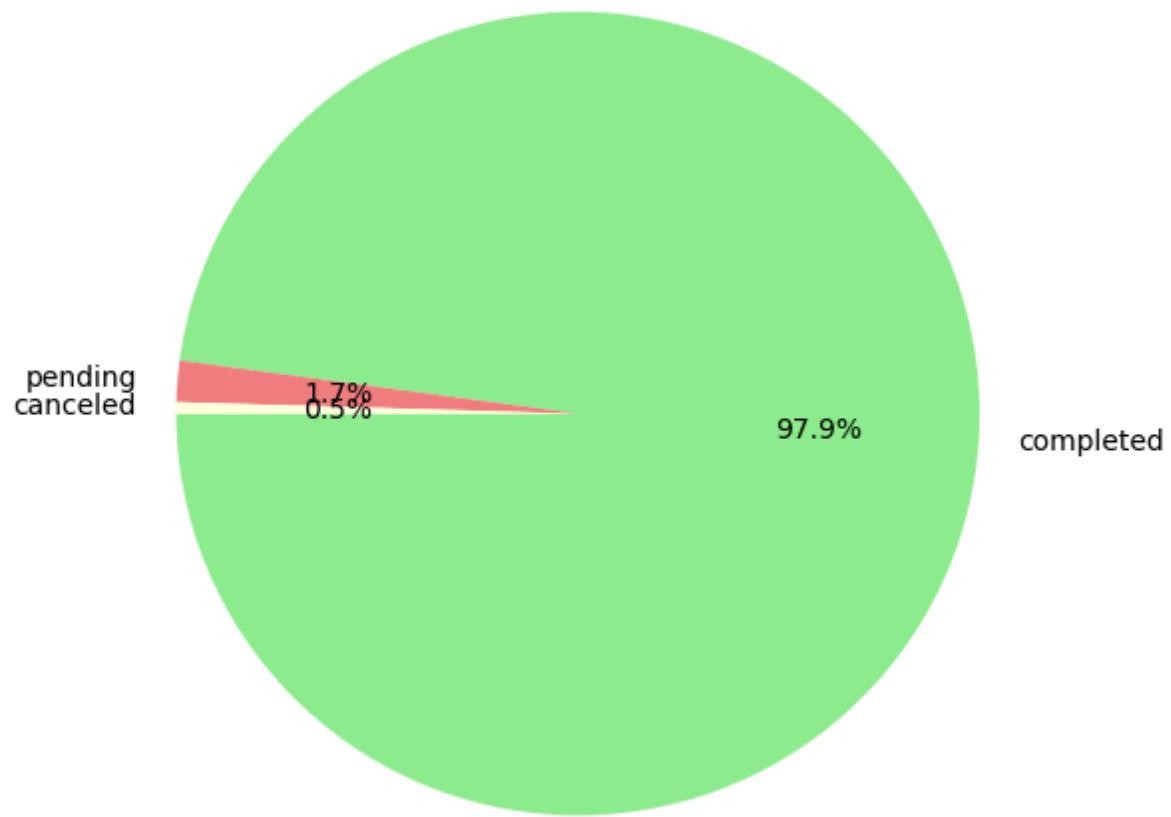
KEY FACTORS INFLUENCING PURCHASE BEHAVIOR:

Category Insights :

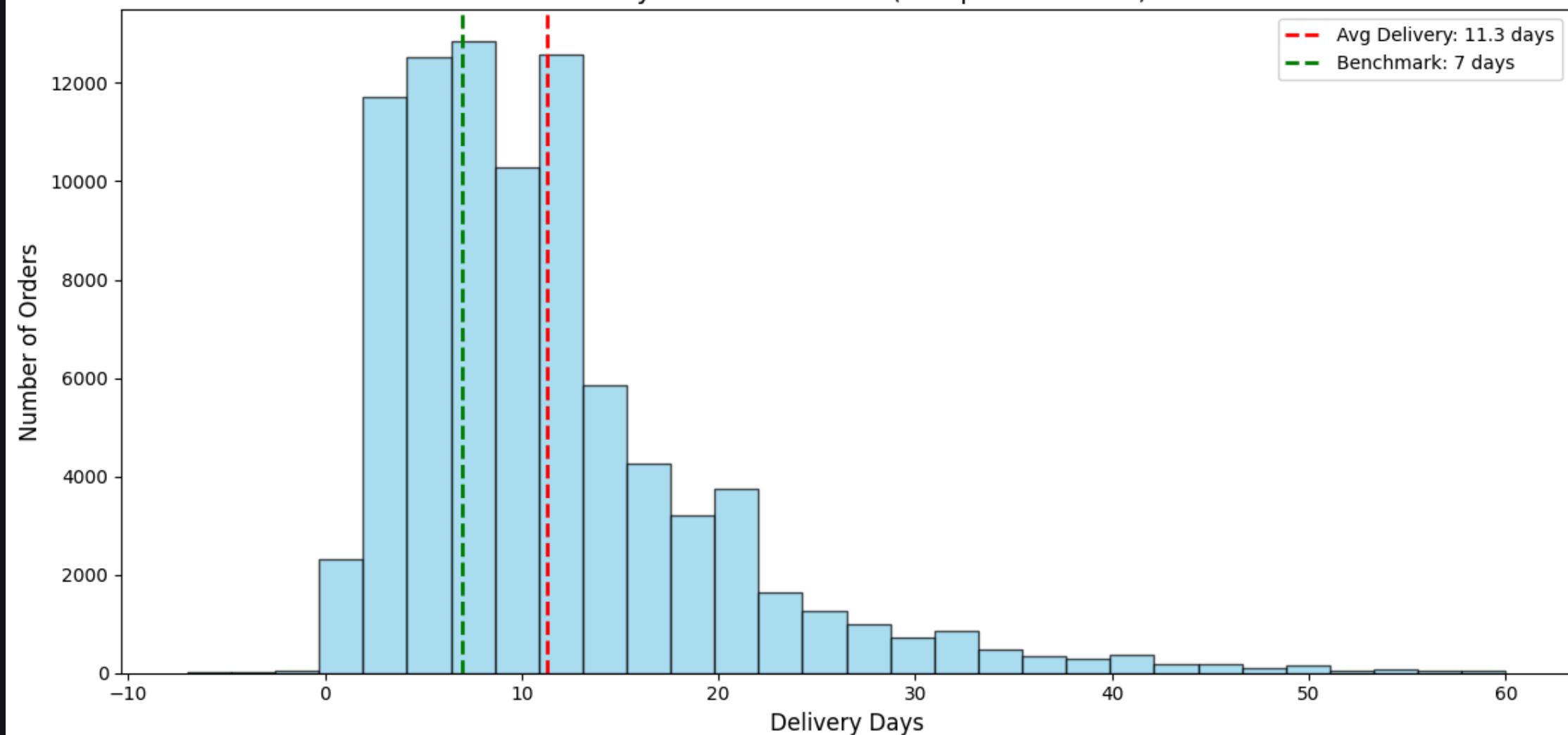
- Toys generate **the largest total revenue** (\$25.96M) due to high sales volume.
- However, categories like **electronics and lifestyle** have a **higher revenue per order**, suggesting stronger upselling and premium pricing opportunities.

How efficient is the order fulfillment process, and what impacts delivery performance?

Order Fulfillment Status Distribution



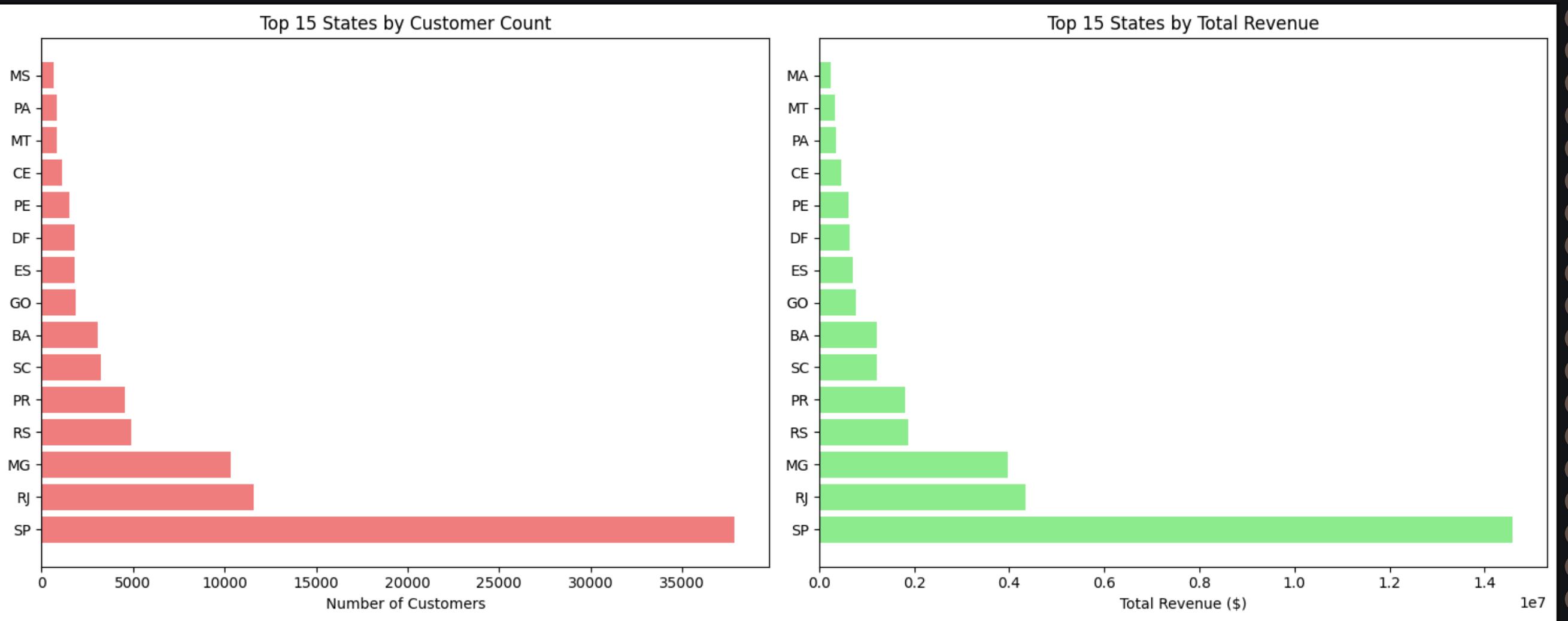
Delivery Time Distribution (Completed Orders)



Order Fulfillment Insights :

- **High reliability:** 97.9% of orders completed (89,316 processed).
- **Slow delivery speed:** Average delivery time = 11.3 days, above the 7-day industry benchmark.
- **Fast deliveries:** ~30.5% of orders delivered within 7 days.
- **Delayed deliveries:** ~21.8% of orders took longer than 15 days.
- **Key bottleneck:** Long-tail delays suggest regional logistics and courier inefficiencies.

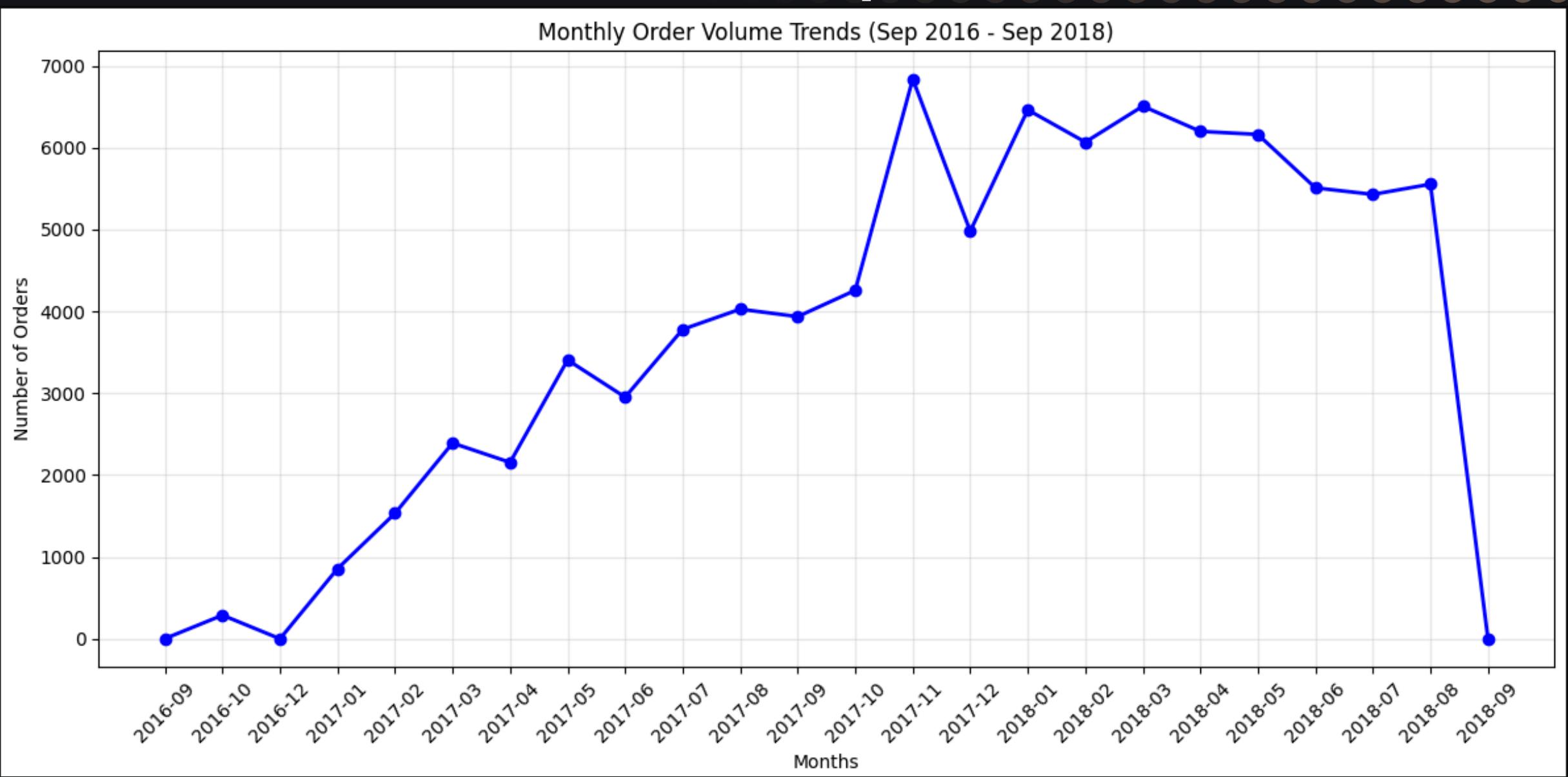
What geographic patterns exist in customer distribution and spending?



Geographic Insights :

- **São Paulo (SP) dominates both** in customer base and total revenue.
- Top 5 states (**SP, RJ, MG, RS, PR**) contribute the majority of **orders and revenue**.
- Some smaller states **show higher revenue per customer**, suggesting premium spending clusters.
- **Implication:** Focus logistics and marketing on urban hubs, while leveraging premium demand from smaller high-value states.

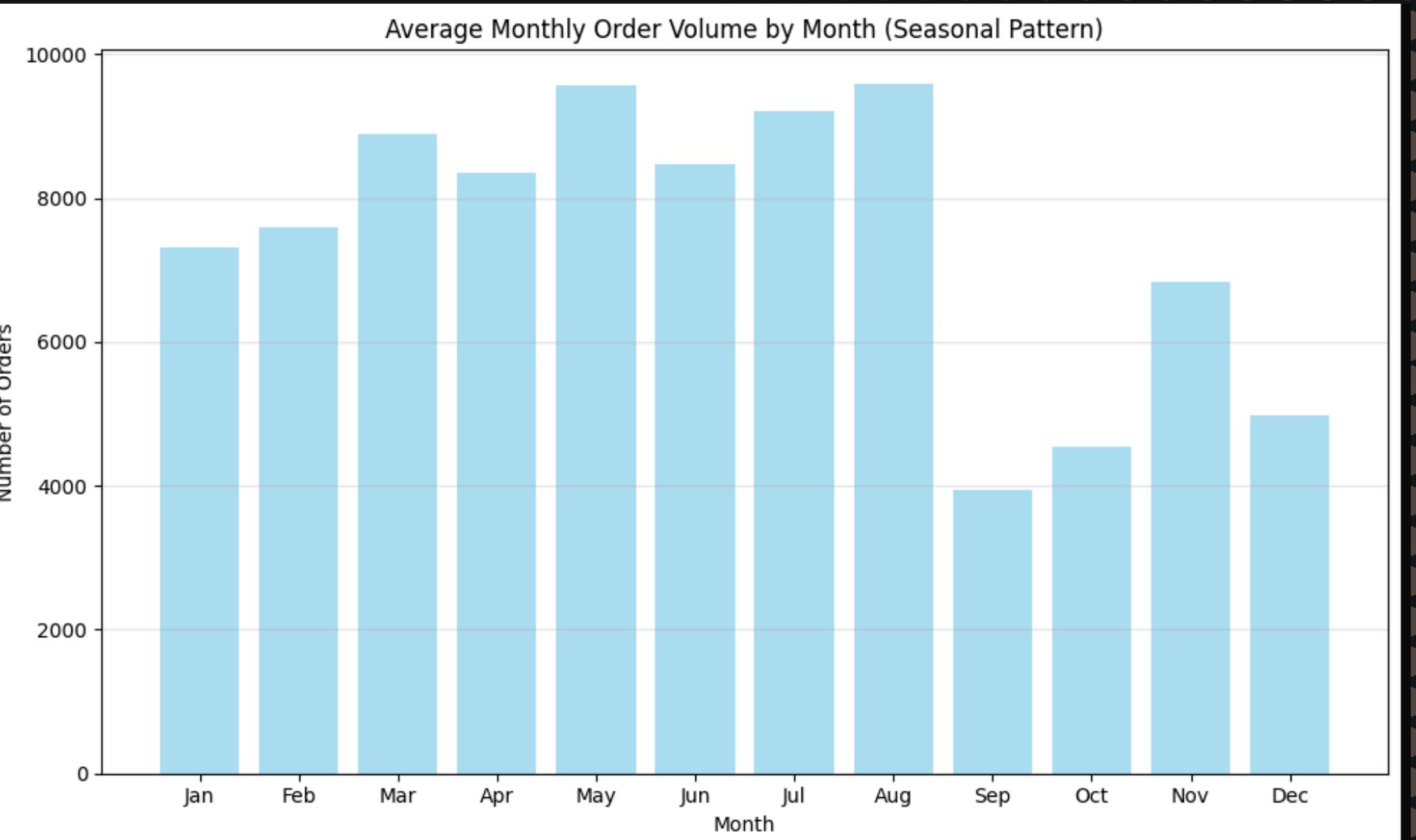
How do seasonal trends affect order volumes and customer acquisition?



Seasonal Trends Insights

- **Growth in 2017:** Order volumes rose steadily, indicating strong customer acquisition.
- **Holiday Peaks:** Noticeable spikes around Nov-Dec, reflecting holiday shopping and seasonal promotions.
- **Early 2018 slowdown:** Significant dip after the holiday season → possible saturation or reduced marketing activity.
- **Recovery mid-2018:** Orders picked up again, showing recurring seasonal demand cycles.
- **Implication:** Business performance is strongly tied to holiday campaigns and promotions, requiring year-round retention strategies.

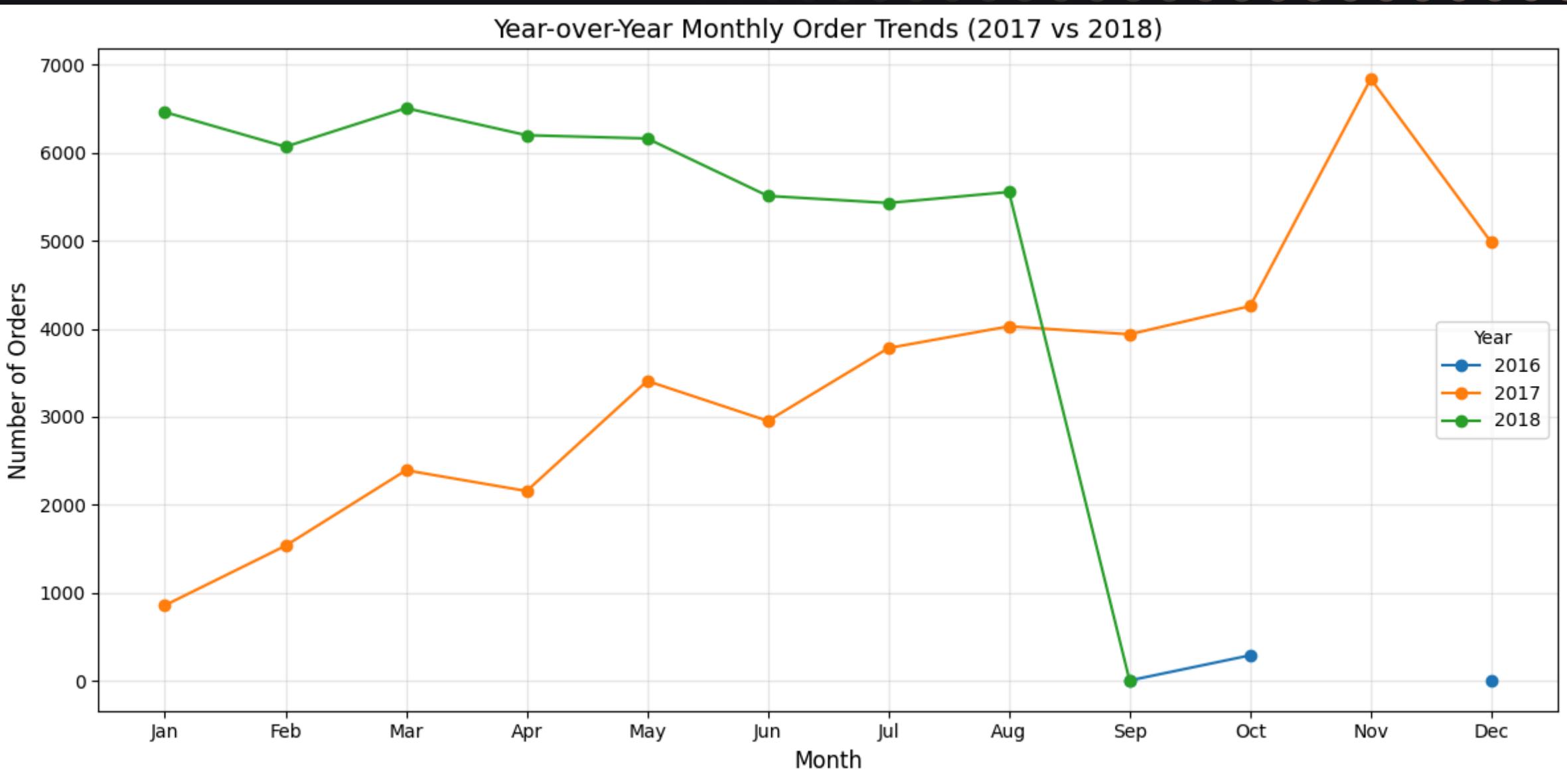
How do seasonal trends affect order volumes and customer acquisition?



Seasonal Trends Insights

- **Mid-year peak (May-Aug):** Strongest order volumes, likely linked to mid-year sales campaigns.
- **Late-year dip (Sep-Oct):** Significant slowdown before holiday season.
- **Holiday recovery (Nov):** Demand rises again with holiday promotions.
- **Implication:** Marketing and logistics should be scaled around mid-year and holiday peaks, with retention programs to stabilize weaker months.

How do seasonal trends affect order volumes and customer acquisition?



Seasonal Trends Insights

- Consistent seasonal pattern:** Both 2017 and 2018 show clear mid-year peaks (around Jun–Aug) and another peak in November (holiday promotions).
- Early-year growth:** 2018 started with slightly higher volumes than 2017, showing stronger customer acquisition momentum.
- Mid-year slowdown:** While 2017 peaked strongly in June/July, 2018's mid-year growth was flatter, suggesting weaker campaign push or demand saturation.
- Holiday resilience:** Both years show recovery in November, confirming holidays as a reliable driver of sales.
- Implication:** Demand is seasonally recurring, but overall growth may depend on maintaining mid-year campaigns — without them, volumes soften.

Main Takeaways

Strong performance:

Business generated high revenue growth with a large customer base across Brazil.

Customer behavior:

Credit card is the most used payment method, while wallet/voucher users have the highest AOV. Toys and lifestyle products dominate sales volume and revenue.

Delivery challenge:

Fulfillment reliability is high (97.9%), but delivery is slow (avg. 11.3 days), with 1 in 5 orders delayed >15 days.

Seasonal trends:

Demand peaks mid-year and in November, showing clear holiday-driven cycles.

Geographic concentration:

São Paulo and top 5 states drive most sales, but smaller states reveal premium demand pockets.

Innovative Concepts

Optimize logistics & delivery:

Invest in regional distribution centers and courier partnerships to reduce delays and improve delivery speed..

Strengthen high-value categories:

Continue pushing toys and electronics/lifestyle while upselling premium products to raise AOV.

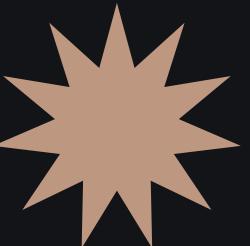
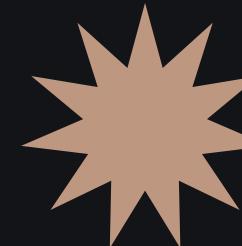
Leverage seasonal campaigns:

Double down on mid-year and holiday promotions; introduce retention programs to smooth out weak months (Sep-Oct).

Focus marketing geographically:

Prioritize major states (SP, RJ, MG, RS, PR) while targeting smaller high-value regions for premium offerings.

End of Presentation



Thank You!