Comprehensive Shopping Behavior Analysis

Purpose

This analysis explores customer shopping behaviour patterns to uncover actionable insights for business optimization. Comprehensive exploratory data analysis (EDA) is applied to assess customer demographics, purchasing patterns, seasonal trends, and marketing effectiveness. The findings offer data-driven recommendations for targeted marketing, inventory management, and customer experience enhancement.

Target Audience

Sales and Product Management

Key Objectives

- Understand customer demographics and purchasing behaviour
- Analyze seasonal and categorical sales patterns
- Evaluate marketing campaign effectiveness
- Identify opportunities for revenue optimization
- Develop customer segmentation strategies

Report Creator

Bernadett Balog

Dataset

Customer ID – Unique identifier for each customer.
Age – Age of the customer.
Gender – Gender of the customer (e.g., Male, Female).
Item Purchased – Specific product bought by the customer.
Category – Broader product category (e.g., Clothing, Footwear).
Purchase Amount (USD) – Total amount spent on the purchase in U.S. dollars.
Location – Customer's geographical location (usually state or region).
Size – Product size (e.g., S, M, L).
Color – Color of the purchased item.
Season – Season during which the purchase was made (e.g., Winter, Spring).
Review Rating – Customer's rating for the purchase (numerical score).
Subscription Status – Indicates if the customer has an active subscription (Yes/No).
Shipping Type – Shipping option selected (e.g., Express, Free Shipping).
Discount Applied – Whether a discount was used for the purchase (Yes/No).
Promo Code Used – Whether a promo code was applied (Yes/No).
Previous Purchases – Number of purchases made by the customer before this one.
Payment Method – Method used to pay (e.g., Credit Card, PayPal, Cash).
Frequency of Purchases – How often the customer makes purchases (e.g., Weekly, Annually).

Customer Demographics Analysis

Age Distribution
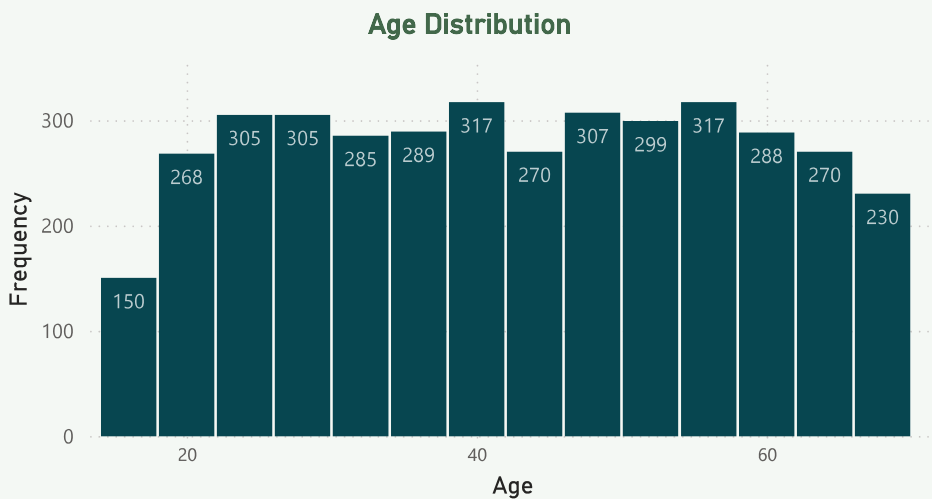
Age	Amount
69	88
57	87
41	86
25	85
49	84
27	83
50	83

Top Ages

7

3900
Number of Customers

44.07
Average Age

18
Minimum Age

70
Maximum Age

Gender ● Female ● Male
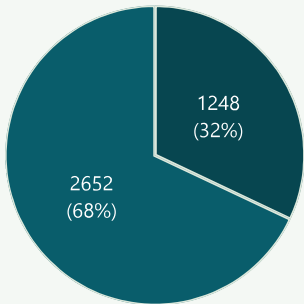
Age Group ● 18-29 ● 30-39 ● 40-49 ● 50-59 ● 60-69 ● 70+

1248 (32%)

2652 (68%)

67 (1.72%)

721 (18.49%)

878 (22.51%)

771 (19.77%)

724 (18.56%)

739 (18.95%)
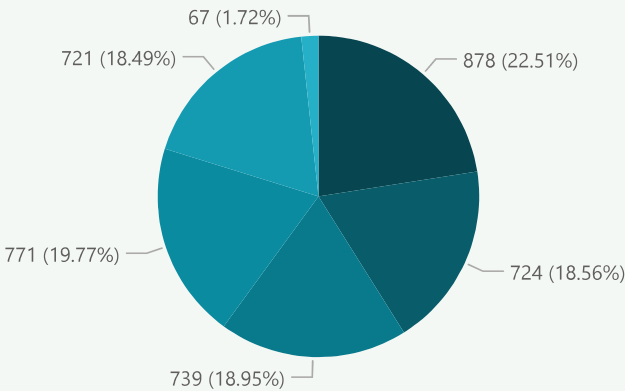
Customer Segmentation based on Location
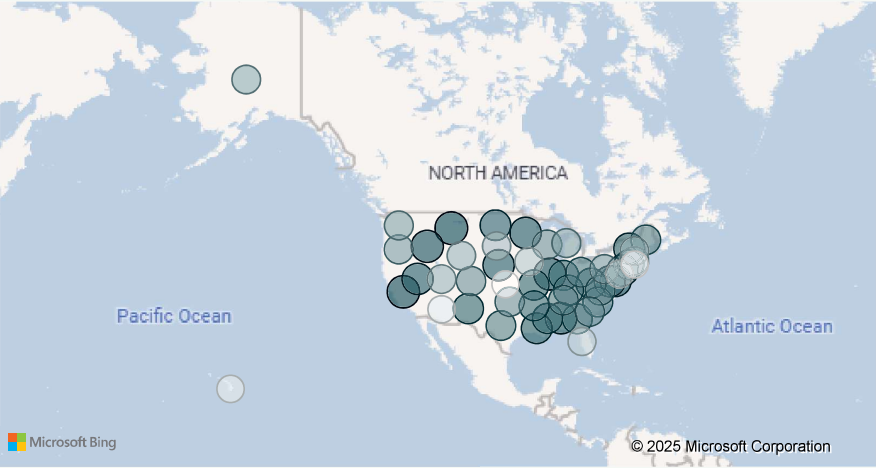
Product Category & Sales

Total Purchase per:

$104,264
Clothing

$74,200
Accessories

$36,093
Footwear

$18,524
Outerwear

$233,081
Total Revenue No Filter

$59.76
Overall Average Purchase Amount

Footwear
Category with Highest Average Purchase

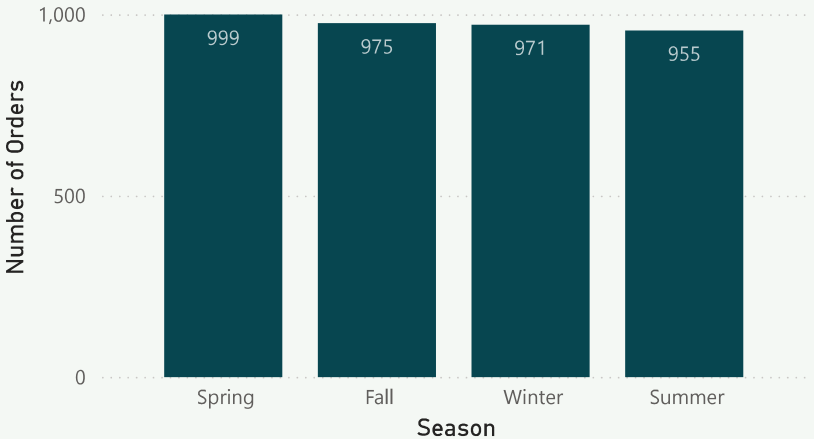## Number of orders by Category

Clothing category dominates purchase volume but may have different average transaction values.

Category	Number of Orders
Clothing	1737
Accessories	1240
Footwear	599
Outerwear	324

Best-performing products for inventory optimization

Item	Purchased Quantity
Blouse	
Jewelry	
Pants	
Shirt	
Dress	
Sweater	
Jacket	
Belt	
Coat	
Sunglasses	
Sandals	
Socks	
Skirt	
Scarf	
Shorts	
Hat	
Handbag	
Hoodie	
Shoes	
T-shirt	
Sneakers	
Boots	
Backpack	
Gloves	
Jeans	
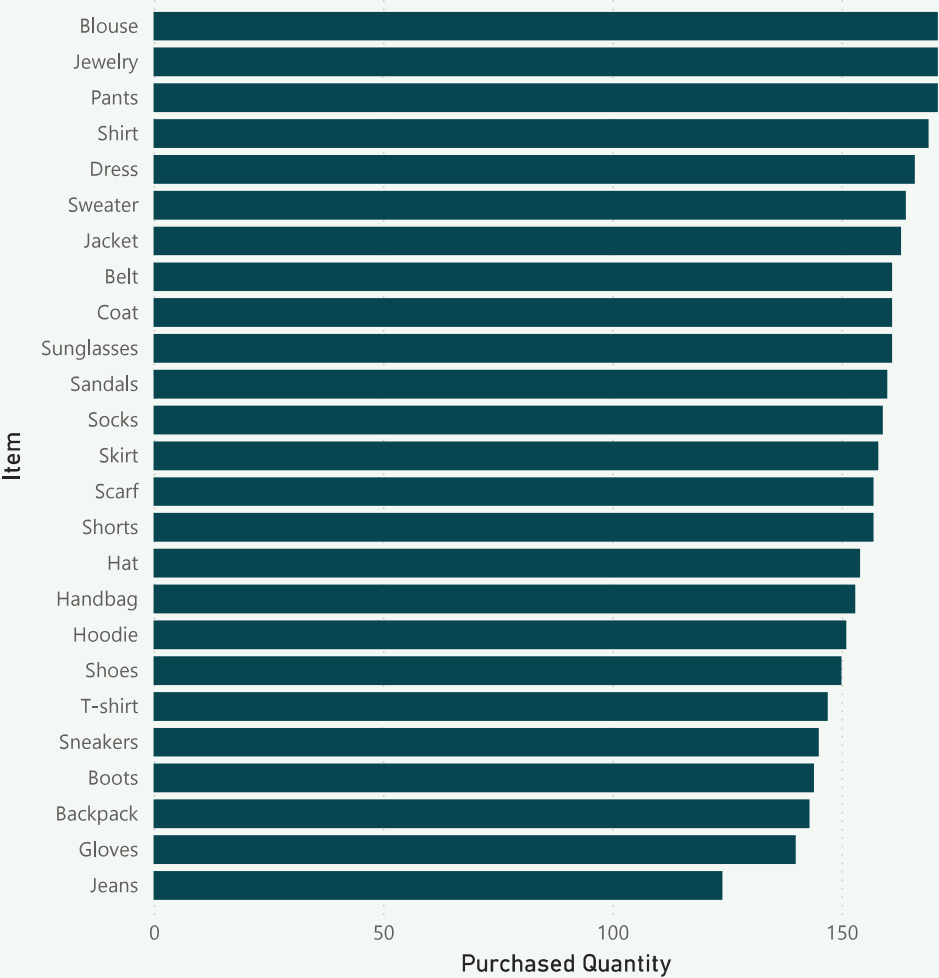
Seasonal Trends Analysis

Most active season is Spring

Number of orders by Season

Number of Orders

- Spring: 999
- Fall: 975
- Winter: 971
- Summer: 955

Average Purchase Amount by Season

Average Purchase Amount ($)

- Fall: 61.56
- Winter: 60.36
- Spring: 58.74
- Summer: 58.41

Season

- Fall
- Spring
- Summer
- Winter
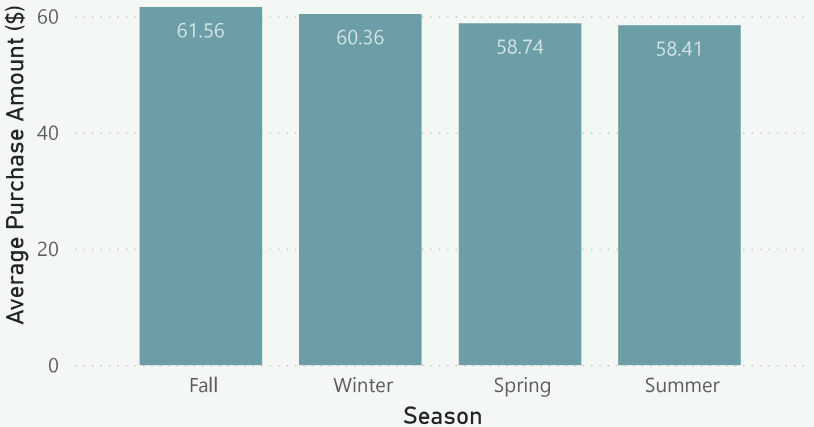
Category Distribution by Season

Percentage (%)

Category ● Accessories ● Clothing ● Footwear ● Outerwear

|	Fall	Spring	Summer	Winter
Outerwear	0.09	0.08	0.08	0.08
Footwear	0.14	0.16	0.17	0.14
Clothing	0.44	0.45	0.43	0.46
Accessories	0.33	0.30	0.33	0.31
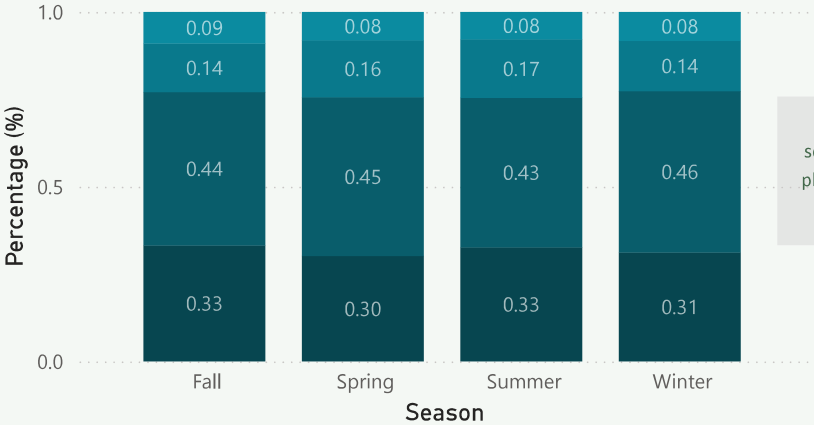
Category preferences change seasonally, which affects inventory planning. In this case, the change is not significant.

Average Review Ratings by Season

Average Review Rating

- Spring: 3.791
- Winter: 3.752
- Fall: 3.730
- Summer: 3.726
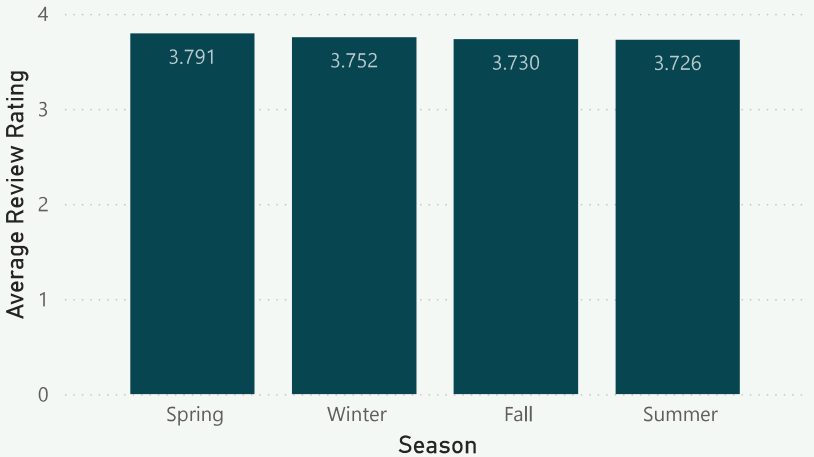
Marketing & Promotion Effectiveness

Discount and **promo code** penetration rates indicate campaign reach

Promo Code Used ● No ● Yes

1677 (43%)

2223 (57%)

Discount Applied ● No ● Yes

1677 (43%)

2223 (57%)
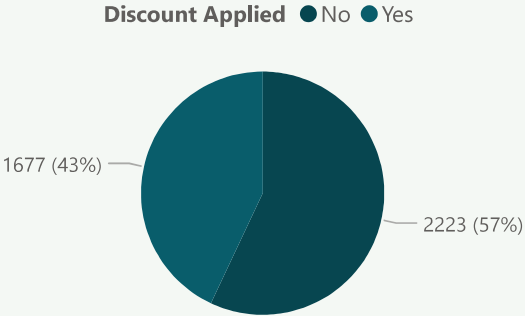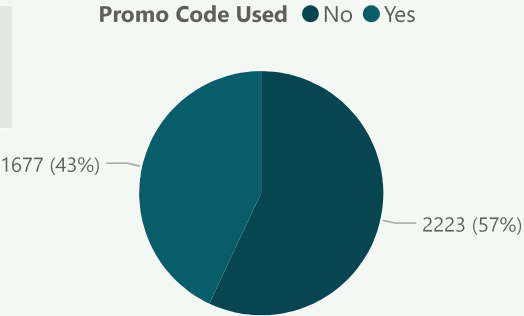
$59.28
Average Purchase with Discount

$60.13
Average Purchase without Discount

Subscription Status Distribution

2847

1053

No — Yes

Subscription Status

Count

Payment Method Preferences

PayPal

Credit Card

Cash

Debit Card

Venmo

Bank Transfer

Payment Method

0   200   400   600

Count
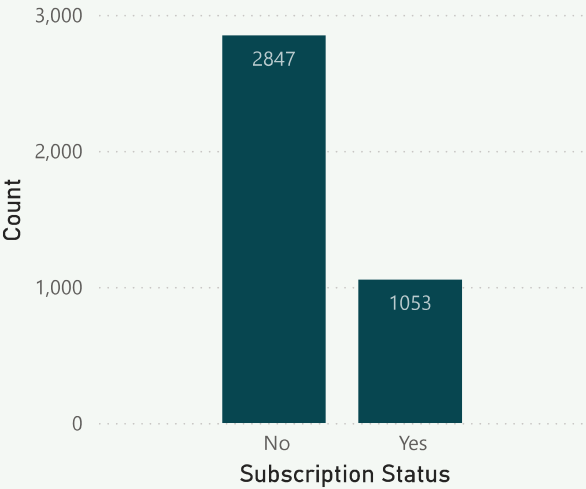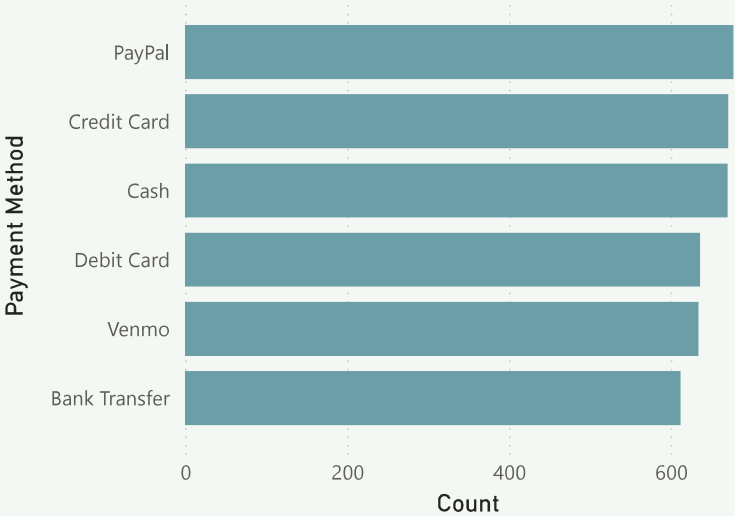
$59.49
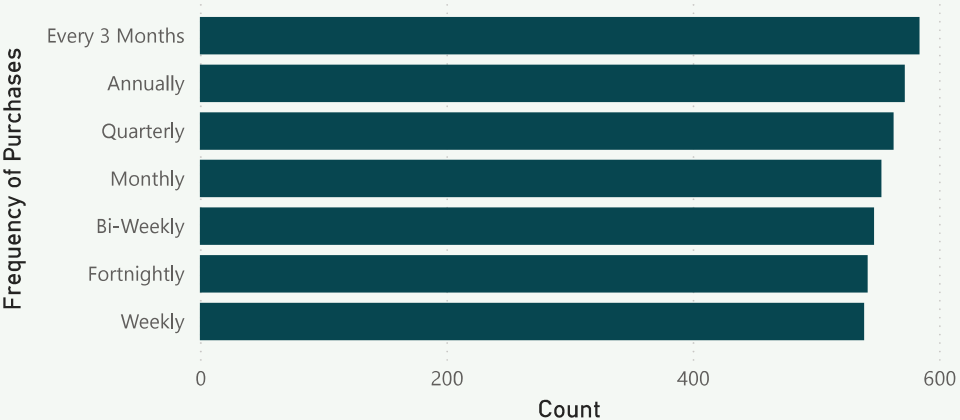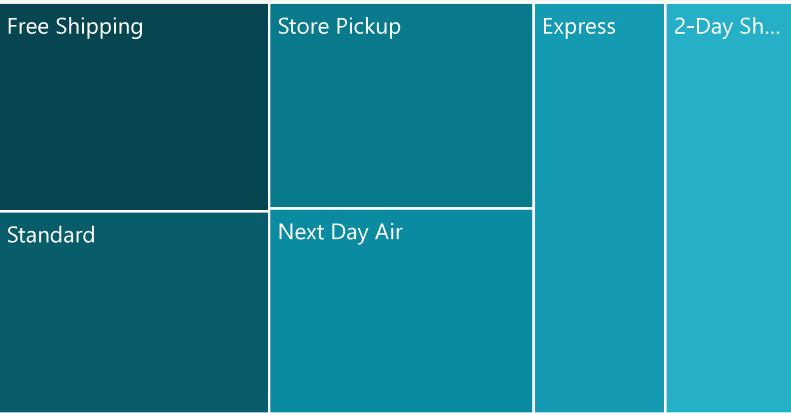Average Purchase with Subscription

$59.87
Avg Purchase with no Subscription

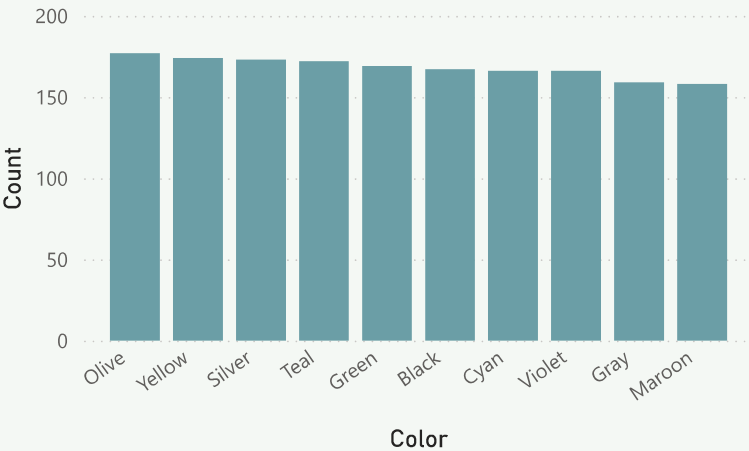**Payment method** preferences inform checkout optimization strategies

Customer Behavior Patterns

Purchase Frequency Distribution

Frequency of Purchases (y-axis):
- Every 3 Months
- Annually
- Quarterly
- Monthly
- Bi-Weekly
- Fortnightly
- Weekly

Count (x-axis): 0, 200, 400, 600

Shipping Type Preferences

- Free Shipping
- Store Pickup
- Express
- 2-Day Sh...
- Standard
- Next Day Air

Top Color Preferences

Color (x-axis): Olive, Yellow, Silver, Teal, Green, Black, Cyan, Violet, Gray, Maroon
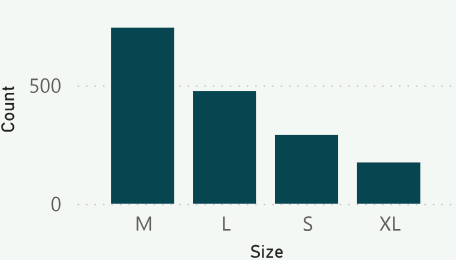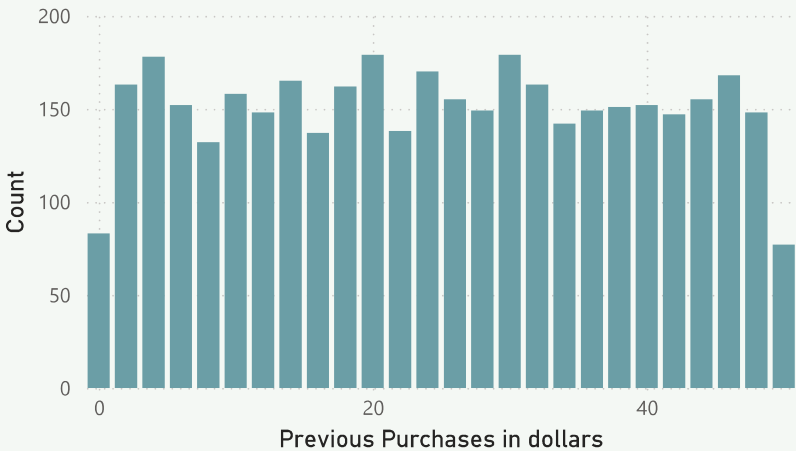
Count (y-axis): 0, 50, 100, 150, 200

Purchase frequency patterns reveal customer engagement levels. **Color and size preferences** guide product development and merchandising.
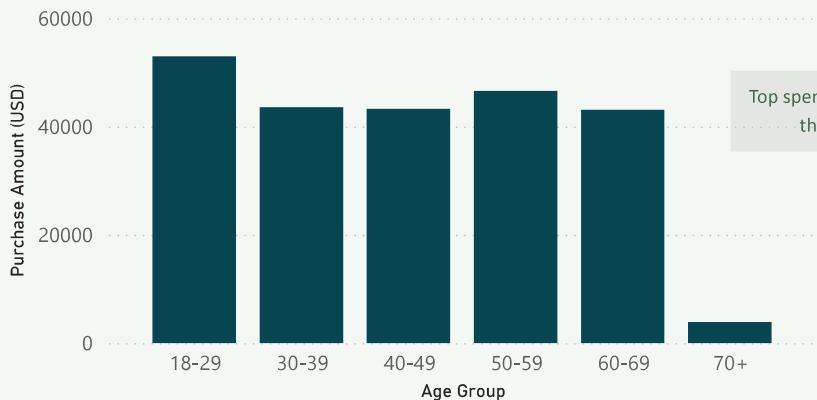
Size Preferences

Size (x-axis): M, L, S, XL
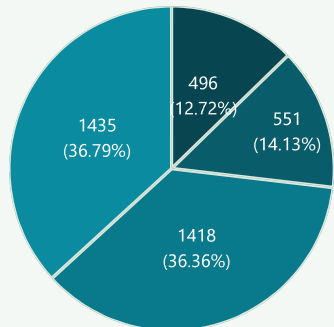
Count (y-axis): 0, 500

Distribution of Previous Purchases

Previous Purchases in dollars (x-axis): 0, 20, 40

Count (y-axis): 0, 50, 100, 150, 200

Customer Segmentation Analysis

Total Purchase Amount by Age Group

Purchase Amount (USD)

60000

40000

20000

0

18-29 30-39 40-49 50-59 60-69 70+

Age Group

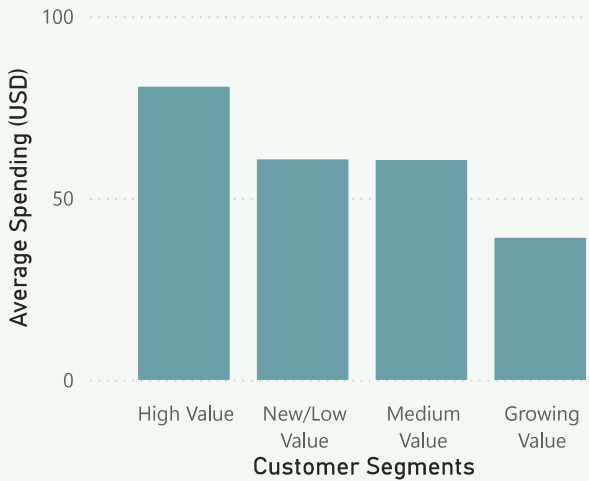Top spending customers are from the **age group 18-29.**

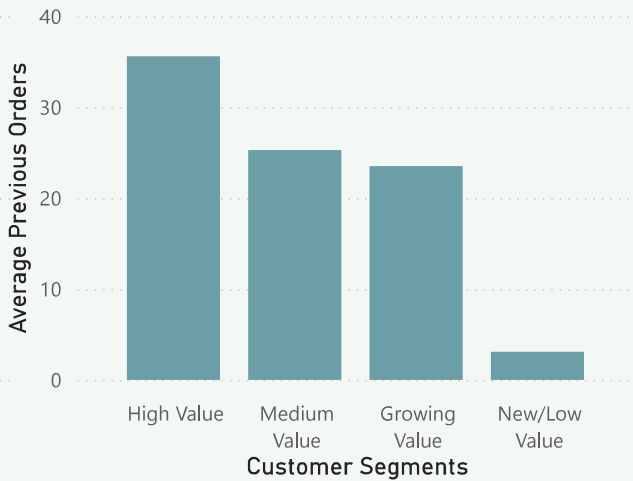**Purchase Category** ● Very high (91$+) ● Low (0-30$) ● High (60-90$) ● Medium (31-60$)

496 (12.72%)

551 (14.13%)

1435 (36.79%)

1418 (36.36%)

Average Spending on Orders by Segment

Average Spending (USD)

100

50

0

High Value | New/Low Value | Medium Value | Growing Value

Customer Segments

Average Previous Orders by Segment

Average Previous Orders

40

30

20

10

0

High Value | Medium Value | Growing Value | New/Low Value

Customer Segments

Subscription vs Non-Subscription by Segment

Count

1,000

500

0

No / Yes — Growing Value
No / Yes — High Value
No / Yes — Medium Value
No / Yes — New/Low Value

Subscription Status in each Segment