Customer Shopping Behaviour Analysis

Analyzing transactional data to identify purchasing patterns, sales trends, and high-value customers through SQL, Python, and Power BI.

Project Scope

Data-Driven Retail Insights Insights

Dataset Overview

3,900 transactions analyzed

18 data columns covering customer profiles, transactions, and behavioral indicators

Technical Approach

- Python for data cleaning
- SQL for business analysis
- Power BI for visualization

Data Preparation in Python

01

Data Loading & Exploration

Imported dataset using Pandas, checked structure with df.info() and summary statistics

02

Missing Data Handling

Imputed 37 missing Review Rating values using median rating per product category

03

Feature Engineering

Created age_group and purchase_frequency_days columns for deeper analysis

04

Database Integration

Connected to MySQL and loaded cleaned data for SQL analysis

Customer Demographics

44

Average Age

Customer age ranges from 18 to 70 years

68%

Male Customers Customers

Gender distribution shows male shopping dominance
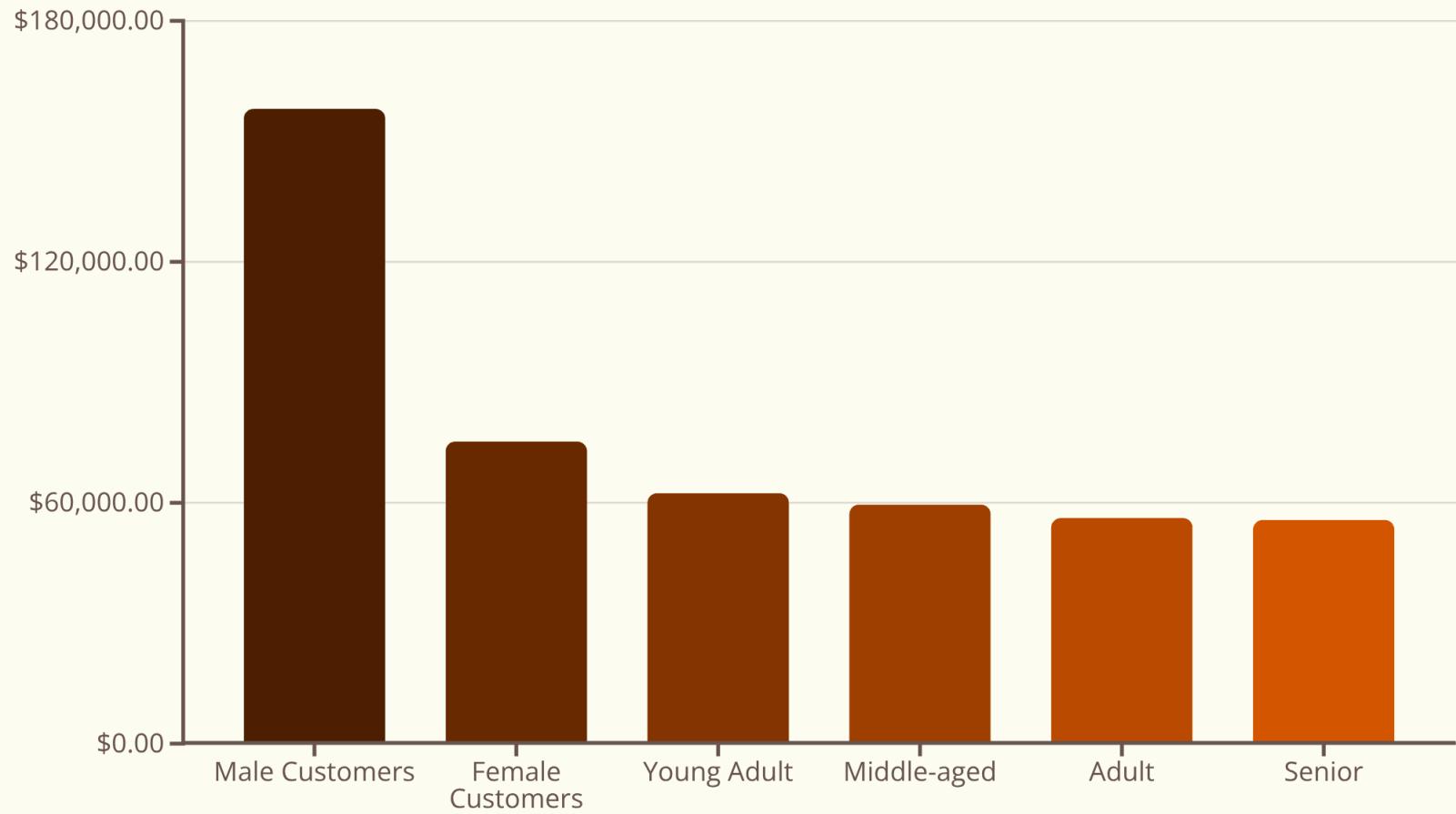
50

Locations

Customers across diverse geographic regions

Customer Segmentation Results

Loyal Customers

3,116 customers

Highest purchase frequency and engagement

Returning Customers

701 customers

Moderate repeat purchase behavior

New Customers

83 customers

First-time buyers with growth potential

Customer segmentation based on purchase history reveals strong loyalty base with opportunity to convert new buyers.

Product Performance Analysis
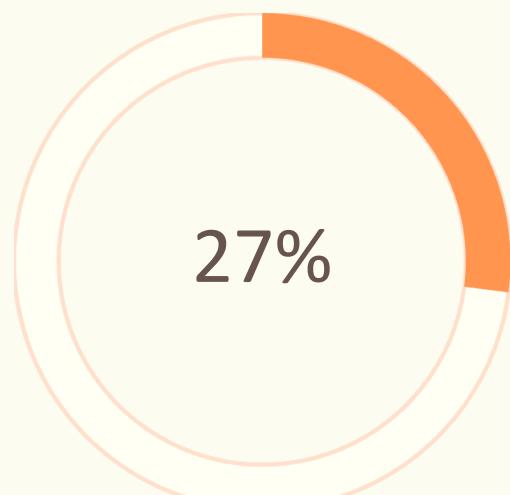
Top Products by Rating

1. **Sandals** - 3.82 rating
2. **Boots** - 3.79 rating
3. **Gloves** - 3.78 rating
4. **Hat** - 3.78 rating
5. **Handbag** - 3.78 rating

Discount-Dependent Products

- Hat - 50% discount rate
- Sneakers - 49.66%
- Coat - 49.07%
- Sweater - 48.17%
- Pants - 47.37%
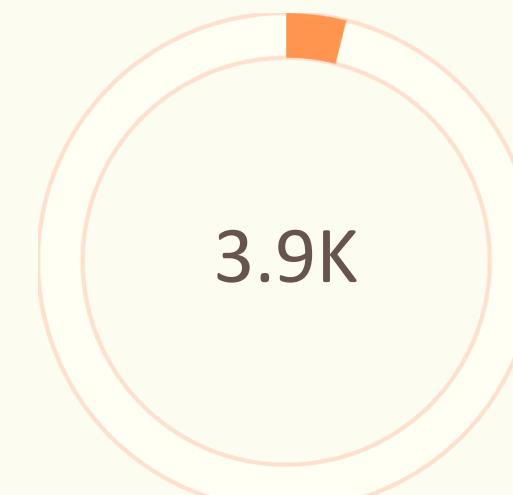
Power BI Dashboard Overview

27%
Subscription Rate

$59.8
Avg Purchase

3.9K
Total Orders

Strategic Recommendations

1

Focus on High-Revenue Categories

Allocate more resources to Clothing and Accessories for improved revenue growth

2

Target Young Adult Customers

Design personalized campaigns and loyalty programs for highest-contributing age group

3

Improve Subscription Conversion

Encourage non-subscribers with exclusive discounts and free shipping benefits

4

Optimize Underperforming Categories

Re-evaluate pricing and promotions for Footwear and Outerwear

5

Maintain Payment Flexibility

Continue supporting multiple payment modes to reduce cart abandonment

Business Impact

Revenue Growth

Data-driven insights support strategic marketing and inventory decisions

Customer Engagement

Targeted campaigns increase conversion rates and lifetime value

Improved Retention

Subscription strategies boost recurring revenue and loyalty