

Customer Shopping behaviour Analysis

Using SQL & Power BI

Project Overview

This project analyzes **customer shopping behavior** using transactional data from approximately **3,900 purchases**. The objective is to understand customer demographics, spending patterns, subscription behavior, product performance, and the impact of discounts to support **data-driven business decisions**.

The analysis was conducted using **SQL for business insights** and **Power BI for interactive visualization**.

Business Objectives

The key objectives of this project are:

- Analyze revenue distribution across customer demographics
 - Compare spending behavior of subscribed and non-subscribed customers
 - Identify high-performing product categories and items
 - Evaluate the impact of discounts and shipping types
 - Segment customers based on purchase history
 - Present insights through an interactive dashboard
-

Dataset Description

The dataset contains customer-level transactional data with the following attributes:

- **Customer Details:** customer_id, gender, age_group, subscription_status
- **Purchase Information:** item_purchased, category, purchase_amount
- **Behavioral Attributes:** previous_purchases, discount_applied, review_rating
- **Operational Fields:** shipping_type

Each record represents a **single purchase transaction**.

Tools & Technologies Used

- **SQL (MySQL/PostgreSQL):** Data querying, aggregation, segmentation, and analysis
- **Power BI:** Interactive dashboard creation and visualization
- **Power Query:** Data transformation and preparation

Data Preparation

- Verified and standardized data types
- Ensured consistency in categorical values
- Handled missing values in review ratings
- Created derived fields such as customer segments and age groups
- Prepared data for analysis and visualization

SQL Analysis & Insights

Revenue by Gender

Total revenue generated by male and female customers was calculated to identify dominant revenue contributors.

Insight:

Male customers generated higher overall revenue, indicating stronger contribution from this segment.

Result Grid			Filter Rows:	Export:	Wrap Cell Content:
	gender	revenue			
▶	Male	157890			
	Female	75191			

High-Spending Discount Users

Customers who used discounts but still spent above the average purchase amount were identified.

Insight:

Discounts do not necessarily reduce revenue, as many high-value customers continue to spend more even after applying discounts.

Result Grid			Filter Rows:	Export:	Wrap Cell Content:
	customer_id	purchase_amount			
▶	2	64			
	3	73			
	4	90			
	7	85			
	9	97			
	12	68			
	13	72			
	16	81			

Top Products by Review Rating

Products were ranked based on average customer review ratings.

Insight:

Highly rated products represent strong customer satisfaction and can be prioritized in marketing strategies.

Result Grid			Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
	item_purchased	average_product_rating				
▶	Gloves	3.86				
	Sandals	3.84				
	Boots	3.82				
	Hat	3.8				
	Skirt	3.78				

Shipping Type Comparison

Average purchase amounts were compared between Standard and Express shipping.

Insight:

Customers opting for Express shipping show slightly higher average spending, suggesting urgency-driven or premium purchases.

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	shipping_type	ROUND(AVG(purchase_amount),2)		
▶	Express	60.48		
	Standard	58.46		

Subscribers vs Non-Subscribers

Average spend and total revenue were compared across subscription status.

Insight:

While non-subscribers generate higher total revenue due to volume, subscribers demonstrate strong average spending, indicating higher value per customer.

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	subscription_status	total_customers	avg_spend	total_revenue
▶	Yes	1053	59.49	62645
	No	2847	59.87	170436

Customer Segmentation

Customers were segmented into:

- **New:** 1 previous purchase
- **Returning:** 2–10 purchases
- **Loyal:** More than 10 purchases

Insight:

A large proportion of customers belong to the loyal segment, highlighting strong repeat purchase behavior.

Result Grid			Filter Rows:	Export:	Wrap Cell Content:
	customer_segment	Number of Customers			
▶	Loyal	3116			
	Returning	701			
	New	83			

Revenue by Age Group

Revenue contribution was analyzed across different age groups.

Insight:

Young Adults and Middle-aged customers contribute the highest revenue, making them key target segments.

Result Grid			Filter Rows:	Export:	Wrap Cell Content:
	age_group	total_revenue			
▶	Young Adult	62143			
	Middle-aged	59197			
	Adult	55978			
	Senior	55763			

Power BI Dashboard

The Power BI dashboard provides an interactive summary of customer behavior and business performance.

Dashboard Features:

- **KPI Cards:** Total Customers, Average Purchase Amount, Average Review Rating
- **Subscription Status Donut Chart:** Subscriber vs Non-Subscriber distribution
- **Revenue & Sales by Category:** Identifies top-performing product categories
- **Revenue & Sales by Age Group:** Highlights key customer demographics
- **Interactive Slicers:** Gender, category, shipping type, subscription status



Purpose:

The dashboard enables stakeholders to explore customer insights dynamically and make informed decisions.

Key Insights

- Subscribed customers show higher value per customer
 - Clothing and Accessories dominate revenue and sales
 - Discounts can increase volume without reducing high-value purchases
 - Loyal customers form the largest segment
 - Young Adults are the most revenue-generating age group
-

Business Recommendations

- Promote subscription plans to repeat buyers
 - Optimize discount strategies for discount-dependent products
 - Focus marketing campaigns on high-revenue age groups
 - Highlight top-rated and best-selling products
 - Strengthen loyalty programs to improve retention
-

Conclusion

This project demonstrates how **SQL-based analysis combined with Power BI visualization** can deliver meaningful insights into customer behavior. The interactive dashboard supports better decision-making in pricing, marketing, and customer retention strategies.