

# Customer Shopping behaviour Analysis

Using SQL & Power BI

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## 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**.

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## 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
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## 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**.

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## 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
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## 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
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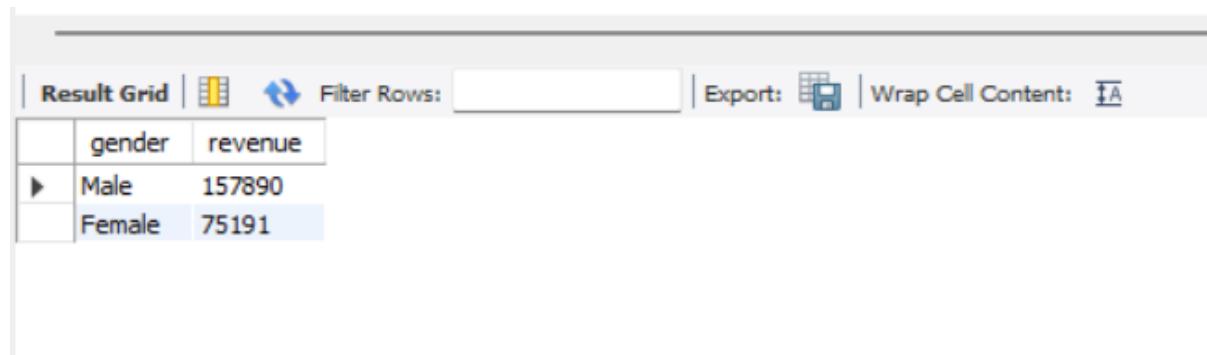
## SQL Analysis & Insights

### 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.



The screenshot shows a software interface with a 'Result Grid' window. The grid displays two columns: 'gender' and 'revenue'. There are two rows of data: one for 'Male' with a revenue of 157890, and one for 'Female' with a revenue of 75191. The 'Male' row is highlighted with a light blue background. The interface includes standard toolbar icons for filtering, exporting, and wrapping cell content.

gender	revenue
Male	157890
Female	75191

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## 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.

A screenshot of a database result grid titled "Result Grid". The grid has two columns: "customer\_id" and "purchase\_amount". The data shows the following rows:

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.

A screenshot of a database result grid titled "Result Grid". The grid has two columns: "item\_purchased" and "average\_product\_rating". The data shows the following 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.

	shipping_type	ROUND(AVG(purchase_amount),2)
▶	Express	60.48
	Standard	58.46

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## 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.

	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
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## 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
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## 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.