Analysis of Customer Shopping Behaviour

SQL & Power BI Based Study

Introduction

Understanding how customers purchase products is essential for improving business performance.
This project focuses on analyzing **customer purchasing patterns** using transactional data to identify trends in spending behavior, subscription usage, product performance, and customer loyalty.

The analysis leverages **SQL for extracting insights** and **Power BI for visual storytelling**.

Project Goals

The objectives of this study include:

- Evaluating customer spending behavior across different demographics
- Comparing purchasing trends between subscribers and non-subscribers
- Identifying products and categories contributing most to revenue
- Assessing the influence of discounts and shipping choices
- Segmenting customers based on historical purchase activity
- Presenting insights through an interactive dashboard

Data Description

The dataset consists of **transactional shopping records** where each entry corresponds to a customer purchase.

Key data fields include:

- Demographic attributes such as gender and age group
- Purchase-related details including item purchased, category, and purchase amount
- Behavioral indicators such as subscription status, discount usage, and previous purchases
- Operational attributes like shipping type and review ratings

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Technology Stack

- **SQL:** Used to perform aggregations, comparisons, and customer segmentation
- **Power BI:** Used to build dashboards and visual summaries
- **Power Query:** Used for preparing data for reporting

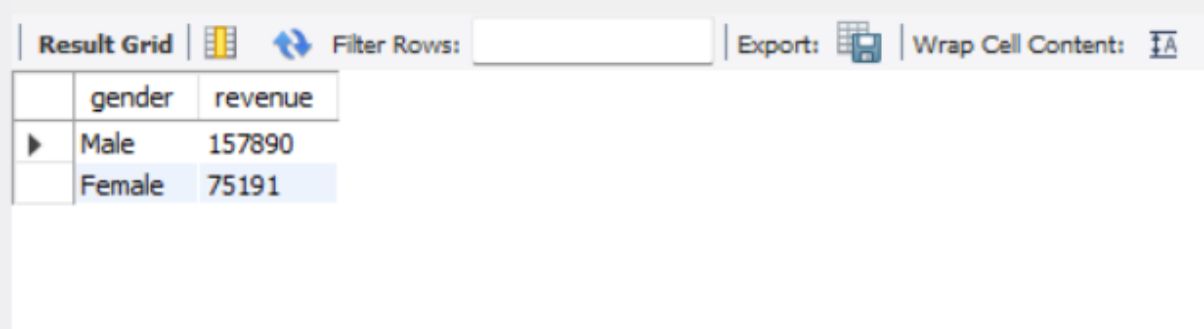
Data Processing Overview

Before analysis, the data was reviewed to ensure consistency and accuracy.
Categorical values were standardized, missing ratings were addressed, and derived fields such as customer segments and age groups were created to support deeper analysis.

Analytical Approach Using SQL

Customer Revenue Distribution

Revenue contribution was analyzed across different customer demographics to understand spending dominance.

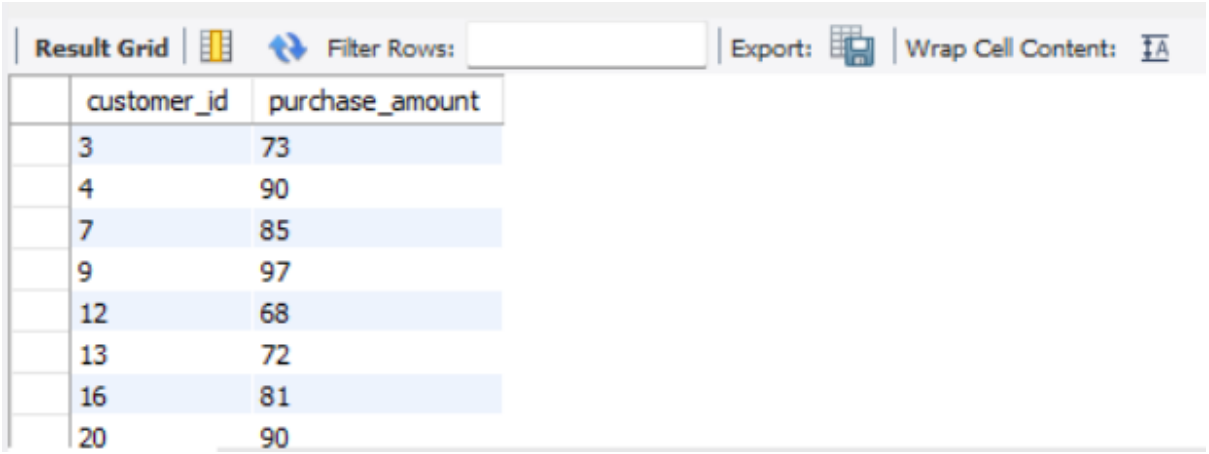


gender	revenue
Male	157890
Female	75191

Observation:
Certain demographic segments contribute disproportionately higher revenue, indicating priority target groups.

Discount Usage & Spending Behavior

Customers who applied discounts but still recorded high purchase values were identified.

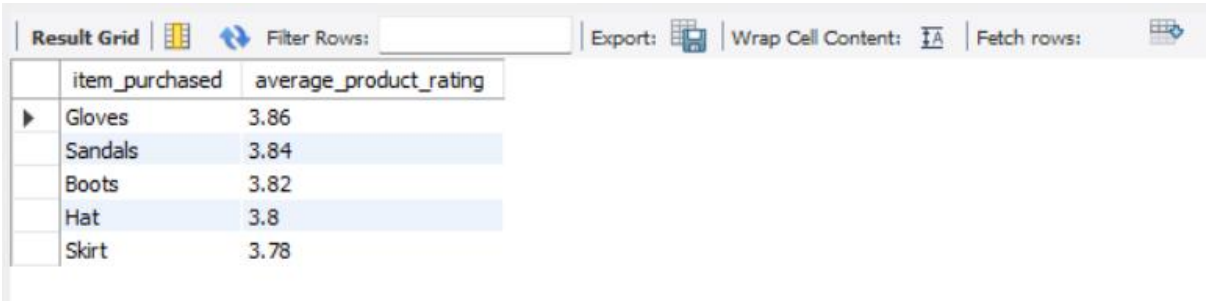


customer_id	purchase_amount
3	73
4	90
7	85
9	97
12	68
13	72
16	81
20	90

Observation:
Discount usage does not always correlate with low spending, highlighting opportunities for smart promotional strategies.

Product Quality Assessment

Products were evaluated based on average customer ratings.

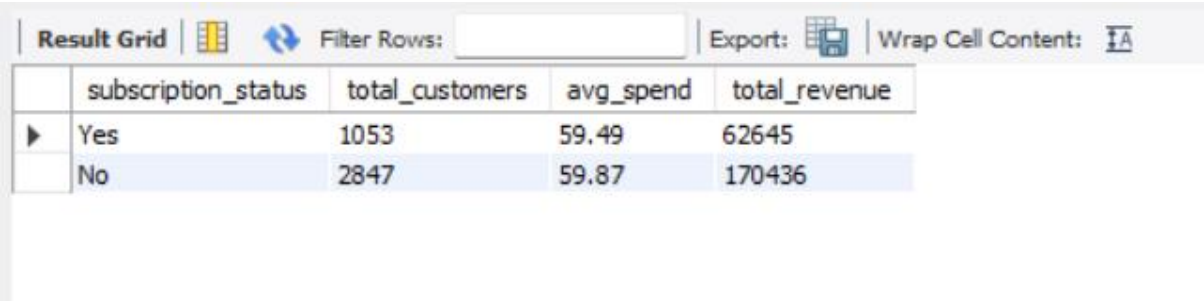


item_purchased	average_product_rating
Gloves	3.86
Sandals	3.84
Boots	3.82
Hat	3.8
Skirt	3.78

Observation:
Highly rated products represent strong customer satisfaction and potential brand advocates.

Subscription Impact Study

Purchasing behavior of subscribers and non-subscribers was compared.



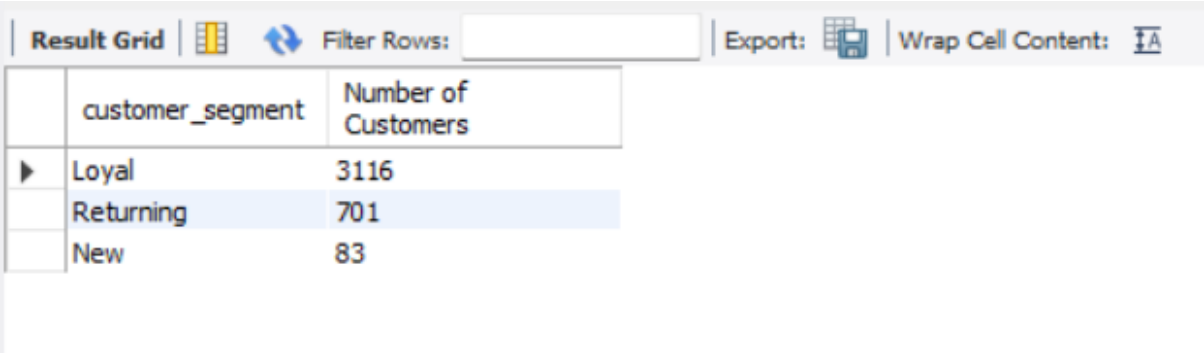
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

subscription_status	total_customers	avg_spend	total_revenue
Yes	1053	59.49	62645
No	2847	59.87	170436

Observation:
Subscribers show higher value per transaction, despite a smaller customer base.

Customer Segmentation

Customers were classified into New, Returning, and Loyal segments based on purchase history.



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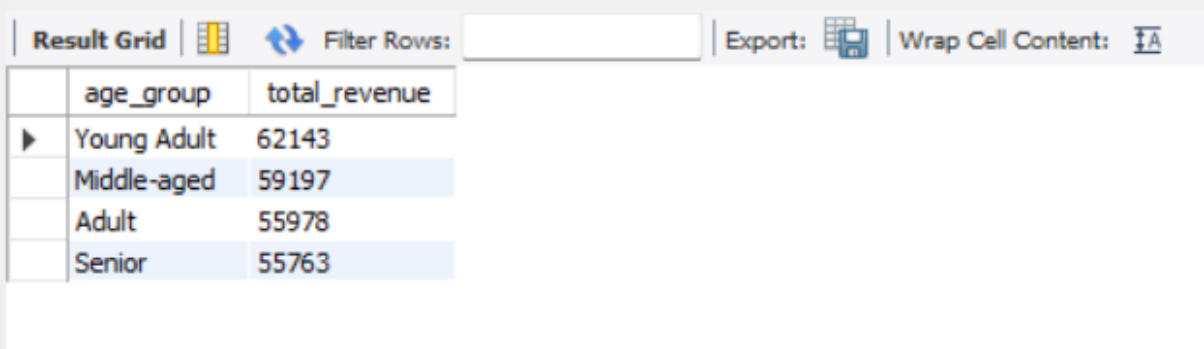
customer_segment	Number of Customers
Loyal	3116
Returning	701
New	83

Observation:
Loyal customers form a significant portion of the customer base, indicating strong retention.

Age Group Revenue Analysis

Revenue contribution across age groups was examined.



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age_group	total_revenue
Young Adult	62143
Middle-aged	59197
Adult	55978
Senior	55763

Observation:
Middle-aged and young adult customers contribute the most to overall revenue.

Power BI Dashboard Summary

An interactive dashboard was created in Power BI to consolidate all findings.

Dashboard Highlights:

- Summary KPIs for customers, spending, and ratings
- Subscription distribution visualization
- Category-wise and age-wise revenue analysis
- Dynamic filters for deeper exploration

Key Findings

- Subscription-based customers exhibit higher spending behavior
- Clothing and accessories are the leading revenue drivers
- Loyal customers represent a stable and valuable segment
- Discounts can increase purchase volume without reducing high-value sales

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Strategic Recommendations

- Encourage subscriptions among repeat buyers
- Refine discount strategies to improve profitability
- Focus marketing efforts on high-performing age groups
- Promote top-rated products to enhance customer trust

Conclusion

This analysis demonstrates the effectiveness of combining **SQL-driven insights** with **Power BI dashboards** to understand customer behavior. The findings can assist businesses in optimizing marketing, pricing, and customer retention strategies.