Customer Insights Analysis using SQL & Power BI

Project Objective

The goal of this project is to uncover actionable insights about customer behavior, satisfaction, loyalty, and product performance. Using SQL for data querying and Power BI for dashboard creation, the analysis supports data-driven decisions to enhance customer experience and product strategy.

Tools Used

- **SQL:** MySQL Workbench
- **Power BI:** For data visualization and dashboard design
- **Data:** Four CSV files — Customers, Products, Transactions, and Reviews

Data Overview

Table Name	Description
Customers	Contains customer details, demographics, loyalty tier
Products	Product IDs, names, categories, and prices
Transactions	Sales transactions with date, product, customer, value
Reviews	Customer feedback, sentiment, and satisfaction ratings

Datasets Used

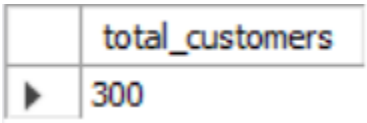
- Customer_Details.csv
- Customer_Feedback.csv
- Customer_Loyalty.csv
- Customer_Satisfaction.csv

These datasets were imported into MySQL Workbench and loaded into Power BI for analysis and visualization.

SQL Queries & Insights

1. **Total Number of Customers**

```
SELECT COUNT(DISTINCT customer_id) AS total_customers
FROM customers;
```

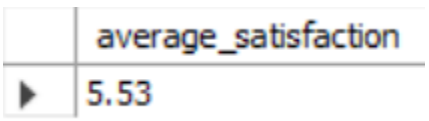


	total_customers
▶	300

Insight: There are **300 customers** in total.

2. **Average Satisfaction Score**

```
SELECT ROUND(AVG(satisfaction_score), 2) AS average_satisfaction
FROM survey_responses;
```



	average_satisfaction
▶	5.53

Insight: The average satisfaction score is approximately 5.53.

3. **Count of Customers by Loyalty Tier**

```
SELECT loyalty_tier, COUNT(*) AS customer_count
FROM customer_loyalty GROUP BY loyalty_tier;
```

loyalty_tier	customer_count
Platinum	80
Gold	76
Bronze	75
Silver	69

Insight: Most customers belong to the Silver tier, followed by Gold and Platinum.

4. **Average Satisfaction Score by Loyalty Tier**

```
SELECT loyalty_tier, ROUND(AVG(cs.satisfaction_score), 2) AS avg_satisfaction
FROM customer_satisfaction cs
JOIN customer_loyalty cl ON cs.customer_id = cl.customer_id
GROUP BY loyalty_tier;
```

loyalty_tier	avg_satisfaction
Platinum	5.72
Silver	5.59
Gold	5.46
Bronze	5.35

Insight: Customers in the **Platinum tier** have the **highest satisfaction**, while Silver is slightly lower.

5. **Top 5 Most Recommended Products**

```
SELECT p.product_name, p.category,
ROUND(AVG(s.recommend_score), 2) AS avg_recommend_score
FROM survey_responses s
JOIN products p ON s.product_id = p.product_id
GROUP BY p.product_name, p.category
```

```
ORDER BY avg_recommend_score DESC
LIMIT 5;
```

product_name	category	avg_recommend_score
Enter 810	Fitness	7.05
Somebody 793	Fashion	7.00
Fly 731	Electronics	7.00
Those 720	Home Appliance	6.79
Woman 842	Home Appliance	6.79

Insight: These are the top-performing products based on customer recommendations.

6. **Customer Count by Age Group**

```
SELECT
  CASE
    WHEN age < 25 THEN 'Under 25'
    WHEN age BETWEEN 25 AND 34 THEN '25-34'
    WHEN age BETWEEN 35 AND 44 THEN '35-44'
    WHEN age BETWEEN 45 AND 54 THEN '45-54'
    ELSE '55+'
  END AS age_group,
  COUNT(*) AS customer_count
FROM customers
GROUP BY age_group
ORDER BY customer_count DESC;
```

age_group	customer_count
25-34	72
35-44	67
55+	61
45-54	59
Under 25	41

Insight: Helps target the largest age segments in marketing.

7. **Satisfaction Score Distribution**

```
SELECT satisfaction_score, COUNT(*) AS customer_count
FROM survey_responses
GROUP BY satisfaction_score
ORDER BY satisfaction_score;
```

satisfaction_score	customer_count
1	79
2	76
3	74
4	74
5	85
6	96
7	86
8	78
9	73
10	79

Insight: Helps understand how satisfaction scores are spread are most customers neutral (5), happy (8–10), or unhappy (1–4)?

8. **Most Frequently Reviewed Products**

```
SELECT p.product_name, COUNT(*) AS review_count
FROM customer_reviews cr
JOIN products p ON cr.product_id = p.product_id
GROUP BY p.product_name
ORDER BY review_count DESC
LIMIT 5;
```

product_name	review_count
Those 720	32
Understand 438	29
Somebody 793	29
Yourself 355	27
All 690	27

Insight: Products that are most talked about — whether good or bad — are your high-engagement items.

9. **Average Recommend Score by Product Category**

```
SELECT p.category, ROUND(AVG(s.recommend_score), 2) AS avg_recommend_score
FROM survey_responses s
JOIN products p ON s.product_id = p.product_id
GROUP BY p.category
ORDER BY avg_recommend_score DESC;
```

category	avg_recommend_score
Fashion	5.86
Home Appliance	5.80
Electronics	5.70
Fitness	5 5.70
Beauty	5.09

Insight: Understand which categories are most loved and which may need rethinking.

10. **Customers with Lowest Satisfaction (Bottom 5)**

```
SELECT c.customer_id, c.name, s.satisfaction_score
FROM customers c
JOIN survey_responses s ON c.customer_id = s.customer_id
ORDER BY s.satisfaction_score ASC
LIMIT 5;
```

customer_id	name	satisfaction_score
280	Laura Hayes	1
184	Betty Johnson	1
161	Brandon Rose	1
121	Devin Hayes	1
73	Kimberly Underwood	1

Insight: Helps identify and possibly follow up with the most dissatisfied customers.

11. Loyalty Tier vs Recommend Score

```
SELECT c.loyalty_tier, ROUND(AVG(s.recommend_score), 2) AS avg_recommend
FROM customers c
JOIN survey_responses s ON c.customer_id = s.customer_id
GROUP BY c.loyalty_tier
ORDER BY avg_recommend DESC;
```

loyalty_tier	avg_recommend
Gold	5.88
Platinum	5.73
Silver	5.51
Bronze	5.47

Insight: See which loyalty group is more likely to recommend products.

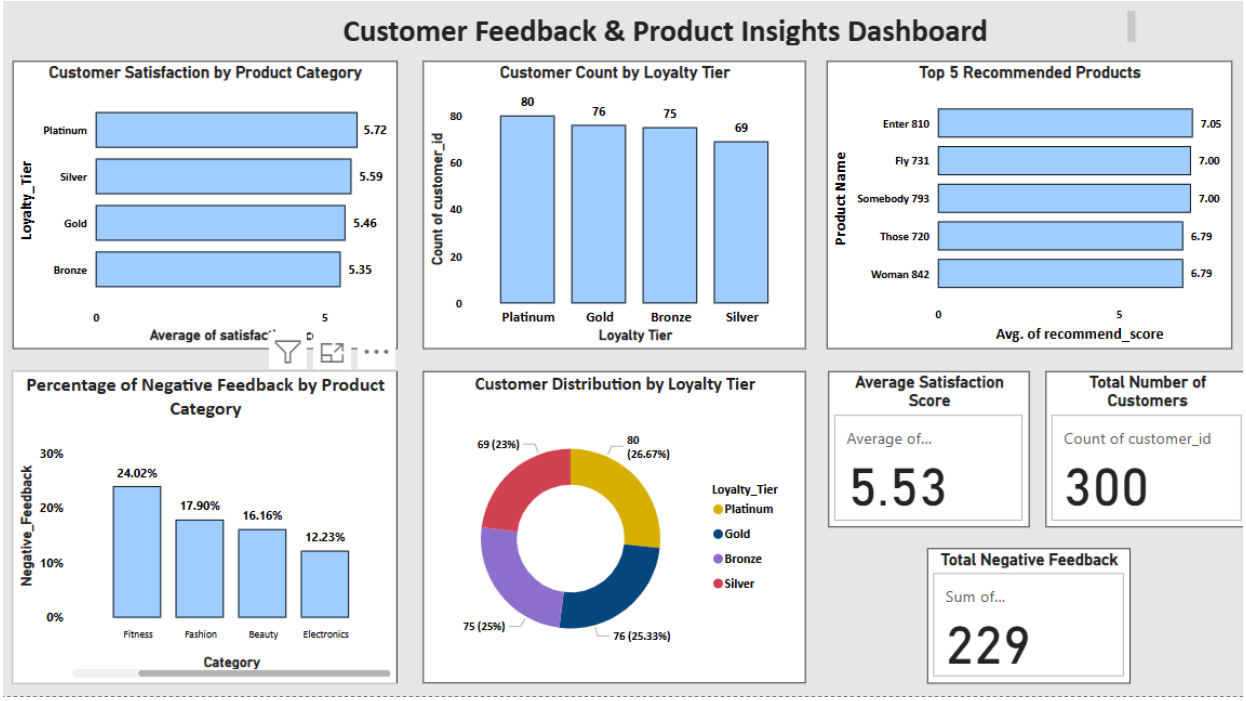
12. Total Number of Reviews per Category

```
SELECT p.category, COUNT(*) AS total_reviews
FROM customer_reviews cr
JOIN products p ON cr.product_id = p.product_id
GROUP BY p.category
ORDER BY total_reviews DESC;
```

category	total_reviews
Home Appliance	299
Fitness	230
Fashion	168
Beauty	168
Electronics	135

Insight: Helps analyze how engaged customers are with different product categories.

Power BI Dashboard



1. **Customer Satisfaction by Product Category:**
   Shows the average satisfaction score by loyalty tier, with Platinum customers being the most satisfied. Satisfaction decreases slightly from Platinum to Bronze tiers.

2. **Customer Count by Loyalty Tier:**
   Displays the number of customers in each loyalty tier, with Platinum having the highest and Silver the lowest. Distribution is fairly balanced among tiers.

3. **Top 5 Recommended Products:**
   Highlights the top five products with the highest recommendation scores. "Enter 810" is the most recommended product, followed closely by "Fly 731" and "Somebody 793."

4. **Percentage of Negative Feedback by Product Category:**
   Fitness products have the highest percentage of negative feedback, followed by Fashion. Electronics category has the least negative feedback from customers.

5. **Customer Distribution by Loyalty Tier (Donut Chart):**
   Illustrates the distribution of customers across loyalty tiers visually. Platinum customers make up the largest portion, while Silver customers are slightly fewer.

6. **Average Satisfaction Score (Card):**
   The overall average customer satisfaction score across all loyalty tiers is 5.53. This indicates a moderately positive customer sentiment.

7. **Total Number of Customers (Card):**
   There are a total of 300 customers represented in the dataset. This metric provides a quick overview of the customer base size.

8. **Total Negative Feedback (Card):**
   The total number of negative feedback instances recorded is 229. This helps gauge overall dissatisfaction volume among customers.

Key Takeaways

- There is a large customer base concentrated in Silver and Gold tiers.
- Overall customer satisfaction is moderate, indicating potential for improvement.
- Feedback sentiment is predominantly neutral to positive.
- Certain product categories drive better customer sentiment.

Conclusion

This project highlights the importance of combining SQL for data querying with Power BI for visualization. Businesses can use these insights to focus on customer retention, improve product offerings, and target the right customer segments more effectively.