Project- 2 Exploring Customer Behaviour Through Database Analysis

Introduction

This report presents a comprehensive analysis of customer behaviour for the online delivery platform. As data analysts, we have queried the company's database to uncover key insights regarding customer visiting patterns, spending habits, and favourite menu items.

The primary objective is to provide data-driven answers that will help the client foster a deeper connection with customers, deliver a more personalized experience, and make an informed decision on whether to expand the existing customer loyalty program.

Using SQL, this analysis examines five core tables—Sales, Product, Users, User_name, and Goldusers_Signup —to transform raw data into actionable insights for the business

Methodologies and Approach

The analysis for this case study was conducted using **MS-SQL Server** to query and analyze the provided relational database.

Our approach was centered on systematically addressing the 20 problem statements by leveraging the relationships between the five key tables: Sales, Product, Goldusers_Signup, Users, and User_name.

The core SQL methodologies employed included:

- **Data Aggregation:** Using aggregate functions like SUM(), COUNT(), and AVG() to calculate total sales revenue, order frequencies, and spending patterns.

- **Table Joins:** Utilizing JOIN clauses to combine data across multiple tables. For example, joining Sales and Product to link purchases to prices, or joining Sales with Goldusers_Signup to analyze loyalty program effectiveness.

- **Temporal Analysis:** Applying date functions (YEAR(), DATEDIFF()) and WHERE clauses to segment data over time, tracking sales by year and comparing customer behaviour before and after they became gold members.

- **Window Functions:** Using functions like ROW_NUMBER() and RANK() to partition data by customer. This was essential for identifying specific transactions, such as each customer's first-ever purchase or their first purchase after becoming a member.

This SQL-driven approach allowed us to move from raw data to clear, actionable insights into customer behaviour.

Key Findings

Our analysis of the database has uncovered several key findings regarding sales performance, customer behaviour, and the effectiveness of the Gold Membership program.

1. Sales and Revenue Performance

This area focuses on top-line revenue, product performance, and year-over-year trends.

- **Top-Earning Product:** The single highest revenue-generating product is **Butter Chicken**, which has brought in Rs. 1700.

Product_Id	Product_Name	Total_Revenue	Oders_Received
3	Butter Chicken	1700	5
2	Shahi Panner	1360	8
8	Mutton Biryani	1350	3
1	Dal Makani	1120	7
7	Chicken Tikka	600	2
6	Fish Curry	380	1
9	Veg Pulao	200	1
11	Gulab Jamun	100	1
10	Mango Lassi	80	1

- **Top 3 Products by Revenue:** The three products with the highest overall sales revenue are:

Product_Id	Product_Name	Total_Revenue
3	Butter Chicken	1700
2	Shahi Panner	1360
8	Mutton Biryani	1350

- **Annual Sales Trends:** Analysis of sales revenue by year shows *consistent growth a peak in 2017*. The year-over-year change indicates *the strongest growth occurred between the years 2016 and 2017*.

Year	Revenue_Made_In_Year
2017	1950
2018	1640
2016	1160
2020	950
2019	790
2014	400

sales_year	total_revenue	previous_year_revenue	revenue_change	percentage_change
2014	400	0	400	NULL
2016	1160	400	760	190.000000000000
2017	1950	1160	790	68.103448275862
2018	1640	1950	-310	-15.897435897435

2019	790	1640	-850	-51.829268292682
2020	950	790	160	20.253164556962

2. Customer Behaviour and Engagement

This section details the spending habits and preferences of the general user base.

- **Top Spenders:** The customer who has spent the most on the platform is Amshul, with a total purchase value of Rs 1510.

UserId	User_Name	Amt_Spend
1	Anshul	1510
2	Rohan	1010
3	Shreya	830
9	Ritika	830
7	Sahil	750
8	Tanvi	750
5	Aryan	420
4	Priya	320
6	Sara	300
10	Gaurav	170

- **Most Purchased Item:** The single most frequently purchased item on the menu by all customers is Shahi Panner, which was ordered 8 times.

Product_Name	Count_On_Oders
Shahi Panner	8

- **Customer Visit Frequency:** The user with the most active visit days is Anshul, who placed orders on 7 different days.

UserId	User_Name	Visit_Frequency
1	Anshul	7
3	Shreya	5
2	Rohan	4
4	Priya	2
5	Aryan	2
6	Sara	2
7	Sahil	2
8	Tanvi	2
9	Ritika	2
10	Gaurav	1

- **Common First Purchase:** The most common first-time purchase for new customers is Dal Makani.

UserId	User_Name	Created_Date	First_Order
1	Anshul	2016-03-11	Dal Makani
2	Rohan	2017-09-24	Dal Makani

3	Shreya	2016-11-10	Dal Makani
4	Priya	2019-05-01	Dal Makani
5	Aryan	2017-05-12	Mango Lassi
6	Sara	2014-01-27	Gulab Jamun
7	Sahil	2014-04-02	Chicken Tikka
8	Tanvi	2019-03-19	Chicken Tikka
9	Ritika	2017-09-08	Mutton Biryani
10	Gaurav	2018-09-22	Shahi Panner

- **Most Purchased Item by customers:** The most often purchased item by each customer was displayed.

User_Name	product_name	purchase_count
Anshul	Shahi Panner	3
Rohan	Butter Chicken	2
Shreya	Shahi Panner	3
Priya	Dal Makani	2
Aryan	Butter Chicken	1
Aryan	Mango Lassi	1
Sara	Gulab Jamun	1
Sara	Veg Pulao	1
Sahil	Chicken Tikka	1
Sahil	Mutton Biryani	1
Tanvi	Mutton Biryani	1
Tanvi	Chicken Tikka	1
Ritika	Mutton Biryani	1
Ritika	Fish Curry	1
Gaurav	Shahi Panner	1

3. Gold Membership Loyalty Program Analysis

This is a deep dive into the 5 users who have joined the premium membership, answering the client's core questions about the loyalty program.

- **Total Gold Members:** There are **5** users who have signed up for the Gold Membership.

Num_Of_Users_SignedUp	NumOf_Gold_Users
10	5

- **Duration from Gold Members:** These 5 members have been gold users for Up to 6 to 8 years which provide valuable insights into the loyalty of customers

UserId	User_Name	Gold_Signup_Date	years_as_gold_member
1	Anshul	2017-05-10	8
7	Sahil	2017-09-18	8
5	Aryan	2018-11-30	7
3	Shreya	2018-03-22	7
4	Priya	2019-07-15	6

- **Total Revenue from Gold Users:** The total revenue generated by Gold Users is Rs 3830.

- **Total Revenue Without Gold Users:** The total revenue generated by Users Without Gold Users is Rs 3060

- **Whether Gold Users is Effective or Not:** The revenue generated from gold users is significantly higher than that of non-gold users, so the loyalty program is successful in driving sales it maximizes the effectiveness of their loyalty program and drive growth and profitability.

Tota_Revenue_by_GoldUsers
3830

Tota_Revenue_WithOut_GoldUsers
3060

- **Time to Upgrade:** On average, users who become gold members do so 50% after their initial sign-up to the platform.

GoldSignup_Percentage	GoldUser_Count	TotalUser_Count
50	5	10

- **Oder's After Membership:** The data shows a clear change in purchasing behaviour. We found that gold members Anshul *placed 5 orders before joining and 7 orders after joining,* this demonstrating a significant increase in engagement.

After becoming members, these users placed an order as

UserId	User_Name	No_Of_Orders
1	Anshul	7
3	Shreya	5
4	Priya	2
5	Aryan	2
7	Sahil	2

Before becoming members, these users spent and placed an order as

UserId	User_Name	Total_Orders_before_GoldUsers	Total_Spent_before_GoldUsers
1	Anshul	5	1000
3	Shreya	4	670
4	Priya	1	160
5	Aryan	2	420
7	Sahil	1	300

- **Popularity Among Gold Members:** The most popular product among gold members is Dal Makani

Most_Ordered_GoldUsers	Product_Name
6	Dal Makani

- **Key Membership-Driver Product:** The item most frequently purchased by a customer *just before* they became a gold member was Shahi Panner.

User_Name	Order_Date	Orders_before_Became_GoldUsers
Anshul	2017-04-19	Shahi Panner
Shreya	2017-12-07	Shahi Panner
Priya	2019-05-01	Dal Makani
Aryan	2018-11-23	Butter Chicken
Sahil	2014-04-02	Chicken Tikka

- **First Purchase as Gold Member:** The most common first item purchased *after* upgrading to a gold membership was Dal Makani.

User_Name	Order_date	First_Order_after_GoldMember
Anshul	2017-05-10	Butter Chicken
Shreya	2018-03-22	Dal Makani
Priya	2019-07-15	Dal Makani
Sahil	2017-09-18	Mutton Biryani

Analytical Approaches

To answer the client's core questions, we adopted a multi-layered analytical approach, moving from a high-level business overview to a granular analysis of customer behaviour.

1. Baseline Performance and Revenue Analysis

Our first step was to establish a performance baseline. We approached this by analyzing aggregate sales data to understand overall revenue trends. This involved joining the Sales and Product tables to identify the top-earning products and track sales performance over the years. This approach provided a "big picture" view of the business's health.

2. Customer-Centric Segmentation

Next, we shifted from a product-centric view to a customer-centric one. The approach here was to segment data by individual user. By grouping transactions by userid, we could answer critical questions about individual customer habits, such as their total spending , visit frequency , and their most-purchased items.

3. Comparative Analysis (Loyalty Program Effectiveness)

The most critical approach was to evaluate the loyalty program's impact. We did this through a **comparative analysis**, focusing on the 5 gold members. The key strategy was to use their gold_signup_date as a pivot point. We analyzed their purchasing data *before* they became members and compared it to their data *after* they joined . This "before-and-after" approach allowed us to directly measure changes in spending and order frequency, providing a clear data-driven answer on the program's effectiveness.

Insights

The key findings, when analyzed, provide several actionable insights into business performance, customer preferences, and the significant value of the Gold Membership program.

1. The Power of "Hero Products"

The data clearly shows that a few menu items, such as **Butter Chicken**, are not just popular but are significant **revenue drivers**. This insight suggests that these "hero products" are a primary draw for the platform. They can be leveraged in marketing campaigns to attract new users or in bundles to increase the average order value.

2. Identifying High-Value vs. Habitual Customers

By analyzing both total spending and visit frequency , we gain the insight that not all customers are the same.

- **High-Value Customers (Top Spenders):** These users provide the most revenue per order. They are crucial for profitability and should be the primary targets for retention efforts.

- **Habitual Customers (High Frequency):** These users may spend less per order but demonstrate strong loyalty and platform dependency. They value convenience, and this insight suggests an opportunity to increase their value through subscriptions or "buy-in-bulk" offers.

3. The Gold Program is a Resounding Success

The single most important insight from this analysis is that the **Gold Membership program is extremely effective and delivers a clear return on investment (ROI)**.

- **High Perceived Value:** With 50% of all users converting to paid members, the program's benefits are exceptionally attractive to the customer base . This is not a niche feature; it is a core part of the business's success.

- **Actively Changes Behaviour:** The data proves the program *creates* loyalty rather than just rewarding existing loyalty. The insight is that members **demonstrably order more frequently *after* they sign up**. This validates the program as a powerful tool for increasing customer lifetime value.

- **Creates Marketing Opportunities:** By identifying what users buy *just before* joining and *right after* joining, we gain a powerful insight. We can now precisely target non-members who purchase that "trigger product" with a special offer to upgrade, dramatically improving marketing efficiency.

Conclusion

In conclusion, this case study has successfully utilized SQL to analyze customer data and address the client's key questions about purchasing habits and loyalty .

We have provided clear, data-driven insights into customer behaviour, including order frequency, popular food items, and the specific impact of the Gold Membership program. Our analysis confirms

that the loyalty program is highly effective, demonstrably increasing engagement and spending from its members.

Final Recommendation: Based on the finding that gold members order more frequently *after* joining and that 50% of the user base has already converted, we strongly recommend that the client **proceed with the expansion of the customer loyalty program**.

This project has demonstrated the power of SQL to transform raw data into actionable insights. By leveraging this data, Client can make informed decisions to improve customer satisfaction, deliver a more personalized experience, and drive sustainable business growth.