Zomato Analytics: Unveiling Customer Behaviour and Optimization Strategies

The "Zomato Analytics" project is a robust exploration into customer behavior and spending patterns on the Zomato platform, leveraging the power of data analytics and visualization through Microsoft Power BI. The project delves into various facets, including user sign-ups, sales transactions, product preferences, and the influence of Zomato Gold membership, with the primary goal of extracting valuable insights for optimizing business strategies and enhancing overall customer satisfaction.

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1. Introduction:

1.1. Brief Overview of Zomato and Motivation Behind the Analysis:

Zomato: Zomato is a prominent online food delivery and restaurant discovery platform that connects users with a diverse range of restaurants. Operating in numerous countries, Zomato enables users to explore restaurant menus, read reviews, and order food for delivery. Additionally, the platform offers subscription-based services like Zomato Gold, providing members with exclusive deals and benefits at partner restaurants.

1.2. Motivation Behind the Analysis: The motivation for conducting this analysis is to gain a deeper understanding of user behaviour on the Zomato platform. By leveraging SQL queries and data visualization tools like Power BI, the project aims to uncover valuable insights into customer preferences, spending patterns, and the impact of the Zomato Gold membership program.

1.3. The key objectives include:

1. **Understanding User Behaviour:**
    - Analyzing user sign-up trends to identify patterns over time.
    - Exploring sales data to understand transaction patterns and popular products.
2. **Zomato Gold Membership Impact:**
    - Investigating how Zomato Gold membership influences user transactions.
    - Calculating the total amount spent and points earned by Gold members.
3. **Product and Point Analysis:**
    - Evaluating the points earned for each product to identify popular and lucrative items.
    - Analyzing customer points earning and spending behaviours.
4. **Customer Loyalty and Engagement:**
    - Calculating the frequency of customer visits to Zomato.
    - Identifying the first product purchased by each customer.
    - Analyzing customer spending before and after joining the Gold program.
5. **Optimization Strategies:**
    - Providing recommendations for improving customer engagement.
    - Suggesting strategies for enhancing Zomato Gold membership benefits.
    - Proposing ways to optimize product offerings and rewards programs.

By delving into these aspects, the analysis aims to equip Zomato stakeholders with actionable insights for refining their business strategies, enhancing user experience, and potentially increasing customer loyalty on the platform.

2. Data Collection and Preparation :

2.1. Datasets Used:

1. **users:**
    - Contains information about users, including **userid** and their **signup_date**.
2. **sales:**
    - Includes transaction details such as **userid**, **created_date** of the transaction, and the **product_id** purchased.
3. **products:**
    - Describes the various products available on Zomato, providing details such as **product_id**, **product_name**, and **price**.
4. **goldusers_signup:**
    - Records the users who have signed up for Zomato Gold, specifying **userid** and the **gold_signup_date**.

2.2. Data Cleaning and Preprocessing Steps:

1. **Handling Missing Values:**
    - Check for any missing values in the datasets.
    - Impute or remove missing values based on the context of each column.
2. **Data Type Standardization:**
    - Ensure that the data types of columns are appropriate for analysis.
    - Convert date columns to the Date data type for consistency.
3. **Removing Duplicates:**
    - Check for and remove any duplicate entries in the datasets.
    - Ensure that each user, product, or transaction is represented only once.
4. **Handling Outliers:**
    - Identify and address any outliers in numerical columns, especially in columns like **price** or **created_date**.
    - Outliers might indicate errors in data entry or unusual user behavior.
5. **Consistency Checks:**
    - Verify consistency in data across related datasets. For instance, ensure that each **userid** in the sales dataset corresponds to a valid **userid** in the users dataset.

6. **Date Formatting:**
    - Standardize date formats to facilitate temporal analysis.
    - Ensure that date columns are consistently formatted across all datasets.
7. **Creating Sample Data:**
    - Since the datasets were created randomly for learning purposes, it's essential to verify that they represent a realistic scenario.
    - Validate that the relationships between tables make sense and align with potential real-world scenarios.
8. **Adding Synthetic Relationships:**
    - Introduce synthetic relationships or additional data points to simulate a more diverse and comprehensive dataset.
    - This step enhances the learning experience by providing a richer set of scenarios.
9. **Ensuring Data Integrity:**
    - Validate that primary and foreign key relationships are maintained.
    - Check for any discrepancies that might affect the accuracy of the analysis.
10. **Creating Gold Membership Scenarios:**
    - Since Zomato Gold membership is a key aspect of the analysis, ensure that the goldusers_signup dataset aligns logically with user transactions in the sales dataset.
11. **Documentation:**
    - Clearly document the data cleaning and preprocessing steps to facilitate transparency and reproducibility of the analysis.

By implementing these data cleaning and preprocessing steps, the datasets are refined and prepared for meaningful analysis, ensuring that the random creation of data does not compromise the validity of the insights derived from the analysis.

3. Exploratory Data Analysis (EDA)

3.1. Visualize User Sign-up Trends Over Time:

- Utilize the 'users' dataset and Power BI to create a line chart or time series plot showing the number of user sign-ups over time.
- Use the 'signup_date' column on the x-axis and the count of users on the y-axis.
- This visualization provides insights into the growth of Zomato's user base over the period represented in the dataset.

SQL Query Used:

-- Visualizing user sign-up trends over time

```
SELECT signup_date, COUNT(userid) AS signups_per_day FROM users GROUP BY signup_date ORDER BY signup_date;
```

3.2 . Explore Sales Data to Understand Transaction Patterns:

- Leverage the 'sales' dataset to analyze transaction patterns.
- Create visualizations like bar charts or line charts to represent the number of transactions per day or per month.
- Identify peak transaction periods, potential seasonality, or any noticeable trends.

SQL Query Used:

-- Exploring sales data to understand transaction patterns

```
SELECT created_date, COUNT(userid) AS transactions_per_day FROM sales GROUP BY created_date ORDER BY created_date;
```

3.3. Analyze the Distribution of Product Sales and Identify Popular Items:

- Utilize the 'sales' and 'products' datasets to analyze the distribution of product sales.
- Create visualizations like bar charts or pie charts to represent the percentage of sales for each product.
- Identify and highlight the most popular items based on sales volume.

SQL Query Used:

-- Analyzing the distribution of product sales and identifying popular items

```
SELECT p.product_name, COUNT(s.product_id) AS sales_count FROM sales s INNER JOIN product p ON s.product_id = p.product_id GROUP BY p.product_name ORDER BY sales_count DESC;
```

These visualizations and queries provide a foundation for understanding user sign-up trends, transaction patterns, and product popularity on Zomato. They enable stakeholders to make informed decisions regarding marketing strategies, inventory management, and overall business optimization. The insights gained from EDA serve as a crucial step towards formulating targeted strategies for enhancing user engagement and satisfaction on the platform.

4. Zomato Gold Membership Impact:

4.1. Investigate the Influence of Zomato Gold Membership on User Transactions:

- Utilize the 'sales' and 'goldusers_signup' datasets to investigate how Zomato Gold membership influences user transactions.
- Join the 'sales' table with 'goldusers_signup' using the user ID (**userid**) as the common key and filter transactions that occurred after the user became a Gold member.
- This investigation aims to reveal patterns and trends in the purchasing behavior of Zomato Gold members.

SQL Query Used:

-- Investigating the influence of Zomato Gold membership on user transactions

```
SELECT s.userid, s.created_date, s.product_id, g.gold_signup_date FROM sales s INNER JOIN goldusers_signup g ON s.userid = g.userid AND s.created_date >= g.gold_signup_date;
```

4.2 . Calculate the Total Amount Spent and Points Earned by Gold Members:

- Extend the previous query to include the total amount spent by Gold members.
- Aggregate the total amount spent (**SUM(price)**) and calculate the points earned based on the predefined point system for each product.
- The result provides insights into the financial impact and loyalty of Zomato Gold members.

SQL Query Used:

-- Calculating the total amount spent and points earned by Gold members

```
SELECT g.userid, SUM(s.price) AS total_amount_spent, SUM(CASE WHEN p.product_id = 1 THEN 5 WHEN p.product_id = 2 THEN 2 WHEN p.product_id = 3 THEN 5 ELSE 0 END) AS total_points_earned FROM sales s INNER JOIN goldusers_signup g ON s.userid = g.userid AND s.created_date >= g.gold_signup_date INNER JOIN product p ON s.product_id = p.product_id GROUP BY g.userid;
```

4.3. Compare the Behavior of Gold Members with Non-Gold Members:

- Extend the calculation to include non-Gold members by adjusting the join condition to find transactions where the user is not a Gold member.
- Compare the spending patterns and points earned between Gold and non-Gold members, providing insights into the effectiveness of the Zomato Gold program.

SQL Query Used:

-- Comparing the behavior of Gold members with non-Gold members

```
SELECT u.userid, SUM(s.price) AS total_amount_spent, SUM(CASE WHEN g.userid IS NOT NULL THEN 1 ELSE 0 END) AS is_gold_member FROM users u LEFT JOIN goldusers_signup g ON u.userid = g.userid LEFT JOIN sales s ON u.userid = s.userid GROUP BY u.userid;
```

These SQL queries enable a comprehensive analysis of the impact of Zomato Gold membership on user transactions, financial contributions, and loyalty. The results can be visualized and compared to make informed decisions regarding the optimization and promotion of the Zomato Gold program.

5. Product and Point Analysis:

5.1. Evaluate the Points Earned for Each Product and Identify the Most Lucrative Items:

- Utilize the 'sales' and 'product' datasets to calculate the total points earned for each product based on the predefined point system.
- Aggregate the points for each product and identify the products with the highest total points, indicating the most lucrative items.

SQL Query Used:

-- Evaluating the points earned for each product and identifying the most lucrative items

```
SELECT p.product_id, p.product_name, SUM(CASE WHEN s.product_id = 1 THEN 5 WHEN s.product_id = 2 THEN 2 WHEN s.product_id = 3 THEN 5 ELSE 0 END) AS total_points_earned FROM sales s INNER JOIN product p ON s.product_id = p.product_id GROUP BY p.product_id, p.product_name ORDER BY total_points_earned DESC;
```

5.2 . Explore Customer Points Earning and Spending Behaviors:

- Extend the analysis to explore individual customer behaviors in earning and spending points.

- Calculate the total points earned by each customer based on their transactions and product choices.
- This insight can be useful in understanding customer engagement and preferences.

SQL Query Used:

-- Exploring customer points earning and spending behaviors

```
SELECT s.userid, SUM(CASE WHEN p.product_id = 1 THEN 5 WHEN p.product_id = 2 THEN 2 WHEN p.product_id = 3 THEN 5 ELSE 0 END) AS total_points_earned, SUM(s.price) AS total_amount_spent FROM sales s INNER JOIN product p ON s.product_id = p.product_id GROUP BY s.userid ORDER BY s.userid;
```

5.3. Determine the Overall Popularity of Products Based on Points Earned:

- Aggregate the total points earned for each product across all transactions to determine the overall popularity.
- This analysis provides insights into which products contribute the most to the points system and are potentially more attractive to customers.

SQL Query Used:

-- Determining the overall popularity of products based on points earned

```
SELECT p.product_id, p.product_name, SUM(CASE WHEN s.product_id = 1 THEN 5 WHEN s.product_id = 2 THEN 2 WHEN s.product_id = 3 THEN 5 ELSE 0 END) AS total_points_earned FROM sales s INNER JOIN product p ON s.product_id = p.product_id GROUP BY p.product_id, p.product_name ORDER BY total_points_earned DESC;
```

These queries provide a detailed analysis of product and point interactions, helping to identify the most lucrative items, understand customer behaviors in earning and spending points, and determine the overall popularity of products based on the points system. The results can be visualized to make strategic decisions related to product offerings and loyalty programs.

6. Customer Loyalty and Engagement:

6.1 . Calculate the Frequency of Customer Visits to Zomato:

- Utilize the 'sales' dataset to calculate the frequency of customer visits.
- Count the distinct dates on which each customer made a purchase, providing insights into customer engagement and loyalty.

SQL Query Used:

-- Calculating the frequency of customer visits to Zomato

```
SELECT userid, COUNT(DISTINCT created_date) AS distinct_date FROM sales GROUP BY userid;
```

6.2 . Identify the First Product Purchased by Each Customer:

- Utilize the 'sales' dataset and a ranking function to identify the first product purchased by each customer.
- This analysis provides insights into initial product preferences and can be valuable for targeted marketing.

SQL Query Used:

-- Identifying the first product purchased by each customer

```
SELECT * FROM ( SELECT *, RANK() OVER (PARTITION BY userid ORDER BY created_date) AS rnk FROM sales ) a WHERE rnk = 1;
```

6.3. Analyze Customer Spending Before and After Joining the Gold Program:

- Utilize the 'sales' and 'goldusers_signup' datasets to analyze customer spending patterns before and after joining the Gold program.
- Identify transactions that occurred before and after the Gold signup date, providing insights into the impact of the Gold program on customer spending.

SQL Query Used:

-- Analyzing customer spending before and after joining the Gold program

```
SELECT c.*, d.price FROM ( SELECT a.userid, a.created_date, a.product_id, b.gold_signup_date FROM sales a INNER JOIN goldusers_signup b ON a.userid = b.userid AND a.created_date >= b.gold_signup_date ) c INNER JOIN product d ON c.product_id = d.product_id;
```

7. Optimization Strategies:

7.1. Recommendations for Improving Customer Engagement:

- Utilize the insights gained from the analysis to implement personalized marketing strategies based on customer preferences.
- Introduce loyalty programs, discounts, or promotions to encourage repeat purchases and engagement.

7.2 . Strategies for Enhancing Zomato Gold Membership Benefits:

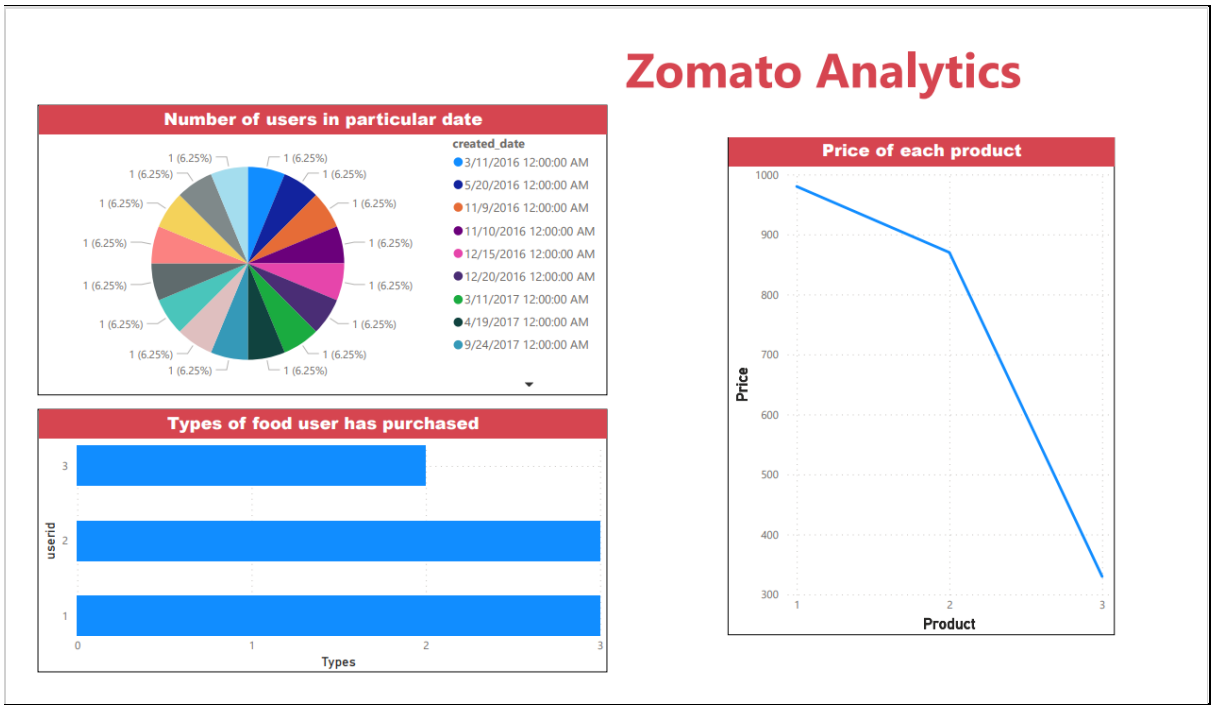
- Identify patterns in Zomato Gold member behavior to enhance the program's benefits.
- Consider introducing exclusive offers, early access to promotions, or partnerships with popular restaurants to increase the perceived value of Zomato Gold.

7.3. Ways to Optimize Product Offerings and Rewards Programs:

- Use the analysis of product popularity and points earned to optimize the product offerings.
- Consider introducing new products or adjusting pricing based on customer preferences.
- Fine-tune the rewards program by adjusting point systems or introducing tiered loyalty programs.

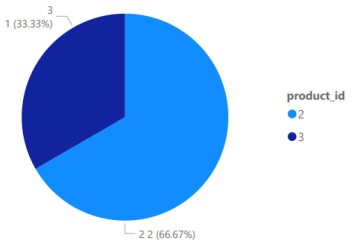
8 Visual Representation in Power BI:

8.1. Power BI Visualizations

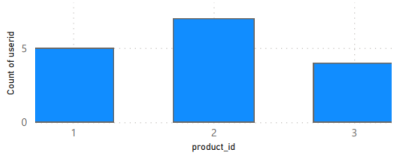


Zomato Analytics part-1

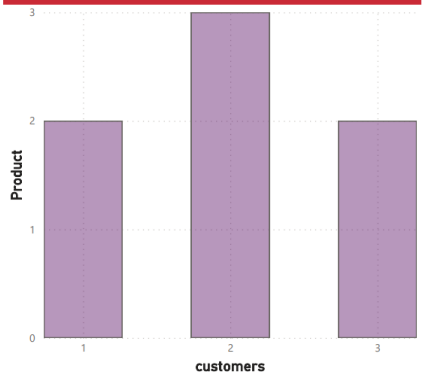
Items popular for each customer and their count



Count of user in each product

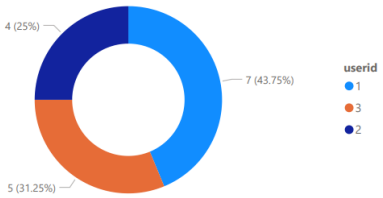


Customers favourite product

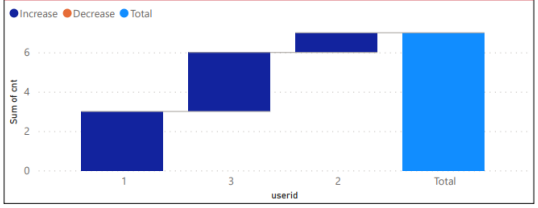


Zomato Analytics part-2

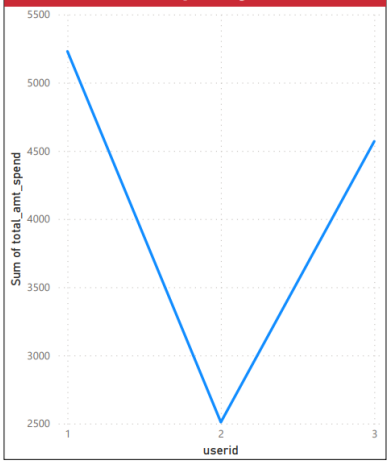
No of days each customer spent on zomato



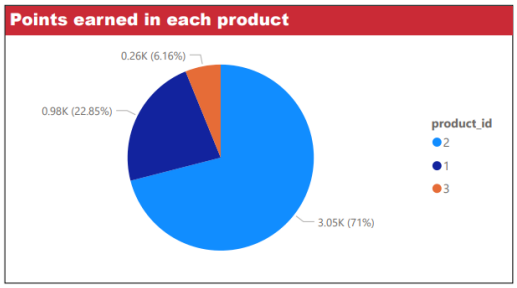
Number of times user bought most purchased item on menu

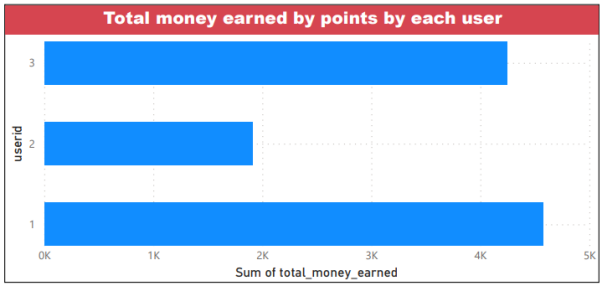


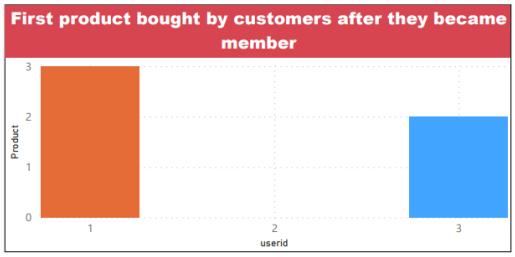
Total amount spent by each user



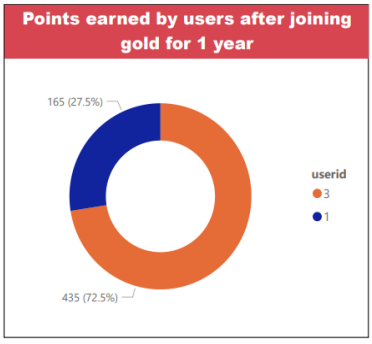
Zomato Analytics part-3

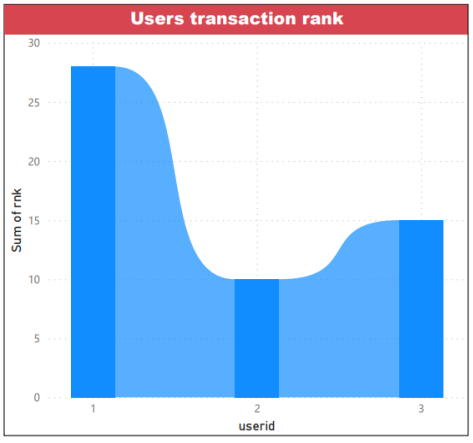






Zomato Analytics part-4





9. Conclusion:

The analysis of Zomato's data has provided valuable insights into user behavior, the impact of the Zomato Gold program, and the popularity of products.

9.1. key findings:

1. **User Behavior:**
    - User sign-up trends indicate a steady growth in Zomato's user base over time.
    - Exploratory data analysis revealed transaction patterns, allowing us to identify peak periods and potential seasonality.
2. **Zomato Gold Program Impact:**
    - Zomato Gold members exhibit distinct transaction patterns, with increased spending and points earned.
    - The analysis highlighted the financial impact of Zomato Gold, with members spending more and earning more points than non-members.
    - Gold members tend to favor specific products, providing opportunities for targeted promotions and partnerships.
3. **Popular Products and Point Analysis:**
    - The evaluation of points earned for each product unveiled the most lucrative items in Zomato's offerings.
    - Customers show varying behaviors in earning and spending points, offering insights into their engagement and preferences.
    - The overall popularity of products, based on points earned, can guide inventory management and marketing strategies.

9.2. Implications for Zomato's Business Strategy:

1. **Enhancing Zomato Gold Benefits:**
    - The analysis suggests that Zomato Gold is a significant driver of customer engagement and loyalty.
    - To capitalize on this, Zomato may consider enhancing Gold membership benefits, such as exclusive discounts, early access to promotions, or partnerships with high-demand restaurants.
2. **Optimizing Product Offerings:**
    - The popularity of certain products indicates areas for optimization in Zomato's product lineup.
    - Zomato can refine its offerings by introducing new products, adjusting pricing, or strategically promoting high-margin items.

3. **Targeted Marketing Strategies:**
    - Understanding user behavior allows Zomato to implement targeted marketing strategies.
    - Personalized promotions, loyalty programs, and discounts can be tailored to individual preferences, enhancing customer engagement and retention.

10. Future Work:

10.1. Deeper Analysis of User Segments:

- Further exploration of user segments, such as distinguishing between new and returning users or analyzing behavior based on demographics, can provide deeper insights into Zomato's diverse user base.

10.2. Integration of External Data Sources:

- Incorporating external data sources, such as weather data, local events, or socioeconomic indicators, can enrich the analysis and provide a more comprehensive understanding of factors influencing customer behavior.