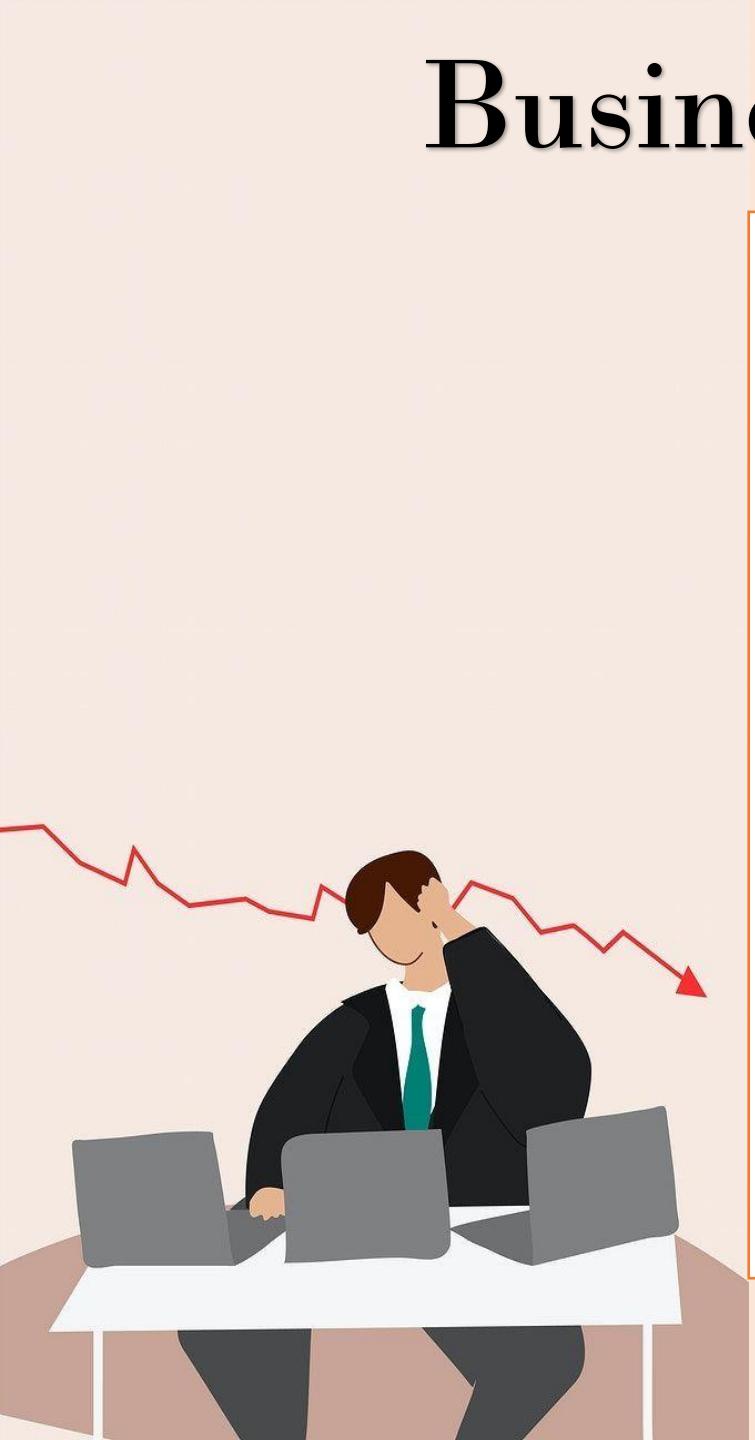# Swiggy Sales & Customer Behavior Analysis
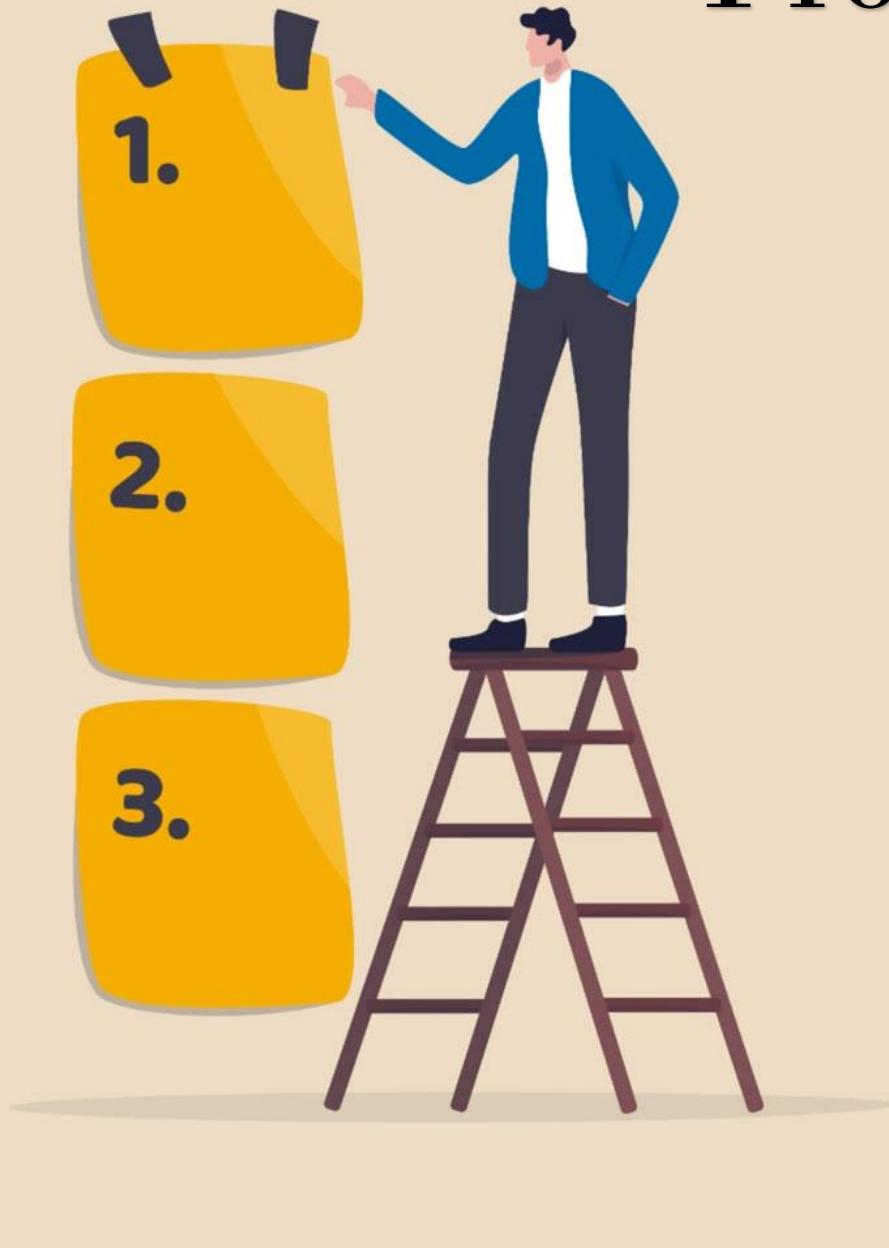
DATA ANALYSIS PROJECT

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Business Problem Statement

1. **Customers face difficulty choosing the right restaurant** because of too many options and a lack of clear insight into ratings, price, and food categories.
2. **It is unclear which food categories generate the highest demand and revenue**, making it difficult to understand customer preferences.
3. **There is no clear visibility on high-performing and low-performing restaurants** based on rating, price, and number of orders.
4. **Price variation across similar restaurants and locations is inconsistent**, making it hard to determine whether customers are getting value for money.
5. **Demand patterns based on location and dish type are not clearly identified**, affecting better targeting and decision-making.
6. **Many restaurants with good ratings are still underperforming**, suggesting that visibility, pricing, or category placement may be affecting performance.
7. **There is no easy comparison between restaurants based on multiple factors** such as delivery time, rating, cost, and popularity.
8. **Seasonal and location-based ordering trends are hidden inside raw data**, making it difficult to identify high-demand areas.
9. **Without proper visual analysis, it's hard to convert raw Swiggy data into actionable business insights.**

Project Objectives

- Analyze customer ordering patterns based on time and location
- Identify best and worst performing food categories
- Study the relationship between price and customer rating
- Optimize business strategy for peak & non-peak hours
- Provide data-driven recommendations to improve revenue
- Develop an interactive business intelligence dashboard
- Track monthly revenue trends
- Find top-performing food categories

Tools & Technologies Used

- **Excel**
  - Created pivot tables and basic charts
  - Used for data cleaning, sorting, and initial analysis

- **SQL**
  - Used for extracting, filtering, and transforming data from the database
  - Writing Business Queries

- **Power BI**
  - Visualization, DAX, Power Query

- **Python(Pandas, NumPy, Seaborn, Matplotlib)**
  - Data cleaning and preprocessing
  - Data manipulation and analysis
  - Exploratory data analysis (EDA)
  - Creating visualizations

Dataset Information

- Columns: state, city, order_date, restaurant_name, location, category, dish_name, price, rating, rating_count, order_year, order_month, order_week, day_of_week, hour, weekend

- Source: Swiggy Public dataset

- Size: 197000+ records

- Format: Excel/xlsx

Methodology

1. **Data collection**
   - Swiggy online food delivery dataset (197,000+ rows)
2. **Data Exploration – Excel**
   - Data validation & cross-checking
   - Pivot tables for quick summaries
   - Basic charts
3. **Data Cleaning & Preparation – Python (Pandas, NumPy)**
   - Removed null and duplicate values
   - Standardized date and time formats
   - Created new features:
      - Order Year, Month, Hour
      - Day of Week, Weekend / Weekday
      - Price Bucket & Rating Bucket
4. **Data Analysis – SQL (PostgreSQL)**
   - 50+ business queries executed
   - Basic: Filtering, sorting, grouping
   - Intermediate: Joins, sub-queries
   - Advanced: CTEs & window functions

5. **Data Visualization – Power BI**
   - Developed 4 interactive dashboard pages:
      - Executive Overview
      - City & Location Performance
      - Restaurant & Category Analysis
      - Time & Customer Behavior
6. **Interpretation & Business Strategy**
   - Identified key patterns and trends
   - Converted insights into actionable business recommendations

Dashboard

1. Executive Overview

Included:

- KPI Cards
  - Total Revenue **[₹ 53.03 Million]**
  - Total Order **[197 K]**
  - Average Order Value **[₹ 268.5]**
  - Average Rating **[4.34]**
  - Total Rating Count **[5.59 Million]**
- Monthly Revenue **(Line Chart)**
- Revenue By City **(Bar Chart)**
- Category Wise Revenue **(Donut Chart)**
- Order By Category **(Donut Chart)**
- Top Performing Restaurant **(Table)**

- **Purpose:** Give decision-makers a quick overview of performance.

Dashboard

2. City & Location Performance

Included:

- KPI Cards
  - Total Location [**942**]
  - Total Order Category [**4.7K+**]
- City Wise Category Count **(Column Chart)**
- Orders By Area **(Table)**
- Revenue Distribution By Location **(Column Chart)**
- Order Flow By City **(Funnel Chart)**
- Orders Vs Revenue By City **(Line Chart)**
- **Purpose:** Find Regional level insights

Dashboard

3. Restaurant & Category Analysis

Included:

- KPI Cards
  - Total Restaurants [**984**]
  - Peak Hour Orders [**17K**]
- Category Performance **(Table)**
- Restaurant Performance Summary **(Table)**
- Category Rank Over Time **(Line & Clustered Column Chart)**
- Category Contribution **(Pie Chart)**
- **Purpose:** Find best and worst performing restaurants in every category

Dashboard

4. Time & Customer Behavior

Included:

- Orders By Hour & Month **(Table)**
- Orders Breakdown **(Decomposition Tree)**
- Category Rank Over Time **(Line & Clustered Column Chart)**
- Day Wise Performance (**Table**)
- Weekend Vs Weekday Order **(Donut Chart)**
- Hourly Revenue Trend **(Tree Map)**
- **Purpose:** Understand ordering patterns

Final Insights

1. **Overall Performance Summary:** The Swiggy dataset contains **197K** total orders across **4,437 categories**, **942 locations**, and **28 states**, generating **₹53 Million** in revenue. The Average Order Value **(AOV)** of **₹268** indicates that customer spending is largely driven by **mid-range purchases** rather than premium, high-value orders.
-   Total records analyzed: **197,000+** orders
-   Peak hours contribution: ~**33%** of total revenue (morning time)

-   Top 3 restaurants by revenue:
    -   KFC – **4.25M**
    -   McDonald's – **3.34M**
    -   Pizza Hut – **2.13M**
-   Top 3 cities by revenue:
    -   Bangalore – **5.5M**
    -   Lucknow – **3.1M**
    -   Hyderabad & Mumbai – **3.0M**

-   Top 3 locations by revenue
    -   Gomati Nagar – **720K**
    -   Whitefield – **676K**
    -   Yelahanka – **581K**
-   Top 3 area by order
    -   Yelahanka – **2283**
    -   Gomati Nagar – **2221**
    -   Whitefield – **2131**

-   **Recommended** category contribution:
    -   **14%** of total orders
    -   **16%** of total revenue
-   **High-rated restaurants (4.0+)** show **stronger revenue consistency**
-   **Revenue concentration:** Top Cities & Brands contribute majority of total revenue

Final Insights

2. Time-Based Ordering Pattern:

- The highest number of orders were recorded in **[Jan]**, with **[≈ 8.3%] more orders than the weakest month[Feb]**
- Monthly revenue is **highly stable**, ranging only between **[₹6.23M – ₹6.83M]**, showing **consistent customer demand**.
- Each month contributes **~11%–12% of total revenue and orders** due to uniformity.
- January alone contributes:
  - **≈11.9%** of Total Revenue
  - **≈12.9%** of Total Order

Hourly Trends

- **Strong morning surge** begins right after **7:00 AM**, indicating high breakfast demand
- Orders **peak between [7:00 AM and 11:00 AM]**, marking this as the most active consumption window
- **Post-8:00 PM**, order volume rises sharply, driven by dinner and late-evening snacking behavior.
- **Highest order spike occurs after 11:00 PM**, highlighting a strong late-night customer segment.

Final Insights

3. Category Level Insights:

- **The top-performing category (e.g., Recommended)** generated the **highest revenue of ≈ ₹7.1M**, making it the biggest driver of platform sales
- **Beverages**, on the other hand, shows **consistently low demand and minimal revenue contribution**, indicating limited customer interest in this segment
- More than **[≈ 17 %] of total revenue** is contributed by only **3–5 major categories**, highlighting that Swiggy's business is heavily dependent on a small set of high-performing food segments

4. Price & Rating Relationship:

- Items in the **mid-price range (≈ ₹100 – ₹300)** consistently received the **highest customer ratings**, reinforcing strong **"value for money"** perception.
- **While extremely high-priced items** often show **lower or inconsistent ratings**, a few premium items **still earn high ratings**, proving customers reward quality when it meets expectations
- Overall, **value and quality together drive ratings**, not just low or high pricing

Final Insights

5. Weekday vs Weekend Analysis:

- **Weekdays dominate platform performance**, contributing **≈ 71% of Orders (140k)** and **≈ 70% of Revenue (₹37.59M)**.
- **Weekends lag behind**, contributing only **29% of Orders (57k)** and **30% of Revenue (₹15.42M)**.
- This strong imbalance reveals a **major growth opportunity to boost weekend sales** through targeted promotions and strategic offers.

6. Location & City-Based Demand:

- **Bangalore** contributes **≈ 9.5%** of the total revenue and ~**10%** of total orders (**20K of 197K**)
- **Lucknow** contributes **≈ 5.4%** of the total revenue and **≈ 5%** of total orders **(10K of 197K)**
- **Hyderabad** and **Mumbai** each contributed **≈ 5%** of total revenue and **≈ 5%** of total orders **(≈10k of 197k)**
- Certain locations inside cities generated up to **2x more orders** than others
- Some cities show **very low conversion despite large population**

7. Rating Bucket Insights:

- Restaurants rated **4.0 – 4.5** produced **maximum revenue**
- Restaurants below **3** show poor sales and poor orders

Final Insights

8. Day-wise Performance:

- **Order patterns fluctuate throughout the week — some weekends show spikes while others drop**, indicating inconsistent customer demand rather than a fixed weekend trend.
- **Highest order frequency occurs on Saturday & Sunday**, while **the lowest orders are observed on weekdays like Monday/Tuesday**, showing clear mid-week slowdowns.
- **Certain days generate high revenue despite lower order counts**, meaning customers place **fewer but higher-value orders**, boosting daily revenue even when volume is low

9. Restaurant analysis:

- The **Top 10 restaurants (Rating ≥ 4 and Price ₹200–₹400)** generate **≈ ₹18M** out of **₹57M**, contributing **≈32%** of Swiggy's total revenue
- These same restaurants deliver **63k out of 197k orders**, accounting for **≈32% of the total order volume**

This means **one-third of Swiggy's entire business is driven by a small set of high-rated, mid-priced restaurants**, highlighting strong customer preference for **affordable pricing and consistently high quality**.