

# DOCUMENTATION



## TOPIC : FOOD TREND ANALYSIS

Customer Analysis Dashboard



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## **ABSTRACT**

This study presents a comprehensive analysis of customer preferences and trends in the Food & Beverage (F&B) industry, using an interactive Power BI dashboard developed on a synthetic yet realistic dataset of approximately 4,500 orders and 22 features. The objective is to uncover patterns related to customer demographics, cuisine popularity, ordering behaviour, platform performance, regional differences, and seasonal fluctuations. The dashboard comprises a home page and six analytical pages: Customer Demographics & Preferences, Product & Menu Insights, Ordering Behaviour & Customer Satisfaction, Regional & Platform Insights, Seasonal & Time-Based Trends, and Future Insights & Recommendations.

Key findings demonstrate that younger customers (18–30) contribute the largest share of online orders; fast food and desserts are high-volume categories; Zomato accounts for a significant portion of orders; wallet and UPI payments dominate urban areas; desserts peak during summer months; and delivery time strongly correlates with customer ratings. Forecasting analysis indicates potential revenue uplift through targeted promotions and category-focused marketing. The report further outlines methodology, detailed visualization design, DAX calculations, business implications, limitations, and future enhancements.

## INTRODUCTION

The Food and Beverage (F&B) industry has undergone a massive transformation in recent years due to technological advancements, changing lifestyles, and evolving consumer preferences. The traditional dining-out culture has been significantly influenced by the growing presence of online food delivery platforms, digital payment systems, and data-driven decision-making in restaurant operations. With rapid urbanization, a busy workforce, and the increasing accessibility of smartphones, customers today have access to a wide variety of cuisines and food choices at their fingertips. Understanding how these customers make decisions what they order, when they order, and from where is crucial for any food business to stay competitive.

The rise of data analytics tools such as Power BI has allowed organizations to analyse large volumes of customer and sales data to identify trends, optimize menus, manage inventories, and enhance customer satisfaction. Through data visualization and business intelligence, companies can uncover patterns such as seasonal demand fluctuations, platform-based order differences (like Swiggy vs. Zomato), regional taste preferences, and customer satisfaction levels based on ratings and delivery time.

This project, *“Food Trends: Understanding Customer Preferences in the F&B Sector”*, leverages a comprehensive dataset of customer orders, including demographic details, product categories, purchase behaviour, payment modes, and delivery platforms. By analysing this dataset, the team aims to generate insights that can help restaurants, food aggregators, and other F&B stakeholders understand consumer behaviour, identify opportunities for growth, and make data-driven business decisions.

## **OBJECTIVES**

The main goal of this project is to explore and visualize customer preferences in the food and beverage sector through a data-driven approach using Power BI. The project aims to transform raw data into clear and actionable insights that can guide decision-making in various dimensions of the food industry.

### **Specific objectives include:**

#### **1. To analyse customer demographics and preferences**

Understand how factors like age, gender, region, and income influence food ordering behaviour and category choices.

#### **2. To identify product and category trends**

Determine which food categories (e.g., Fast Food, Desserts, Beverages) dominate orders and how their demand fluctuates across time.

#### **3. To study order patterns and customer satisfaction**

Examine how ratings, delivery times, and order frequency are related to satisfaction levels and repeat purchases.

#### **4. To analyse platform-based performance**

#### **5. To study regional and seasonal variations**

#### **6. To forecast future food trends**

#### **7. To develop a comprehensive, interactive Power BI dashboard**

#### **8. To provide data-driven business recommendations**

Conclude with actionable insights and strategies that businesses can adopt to enhance customer experience, operational efficiency, and profitability.

## **PROBLEM STATEMENT**

In the competitive and dynamic F&B market, businesses struggle to keep up with continuously changing customer demands and preferences. The lack of real-time insight into consumer behaviour often leads to poor decision-making in areas such as menu design, pricing, regional marketing, and delivery operations.

Although large volumes of transactional and customer data are collected daily by restaurants and delivery platforms, this data is often underutilized or not properly visualized to derive meaningful insights. As a result, companies fail to answer critical business questions such as:

- Which regions or platforms are generating the highest revenue?
- What time of year or day sees the maximum order traffic?
- How do different demographic groups influence food category preferences?
- What are the most preferred payment modes or order platforms?
- How does customer satisfaction correlate with order frequency or delivery time?

Without a structured analytical approach, it becomes difficult for management teams to identify key growth opportunities or areas requiring improvement. Thus, there is a strong need for a comprehensive data-driven analysis that can bring clarity to customer behaviour and reveal the underlying trends shaping the food market.

This project addresses this challenge by creating a Power BI dashboard that consolidates, visualizes, and interprets the

## SCOPE OF THE STUDY

The scope of this study extends across the analytical examination of customer preferences, food consumption behaviour, and operational trends within the Food & Beverage (F&B) sector using business intelligence tools. This project specifically focuses on the creation of an interactive Power BI dashboard that captures diverse aspects of consumer behaviour from order frequency to payment modes, delivery platforms, and regional patterns.

The study encompasses both the **consumer perspective** and the **business perspective**, offering insights that can benefit multiple stakeholders in the F&B ecosystem, including restaurant owners, marketing teams, delivery aggregators, and supply chain managers.

From the **consumer perspective**, the scope includes understanding what drives customer satisfaction and loyalty. This involves studying key factors such as cuisine preference, spending capacity, order timing, and delivery experience. These insights can help businesses tailor their menu offerings, personalize promotions, and enhance service quality.

From the **business perspective**, the project provides a holistic view of performance indicators such as total revenue, customer retention, regional contribution, and seasonal sales. The insights drawn from this analysis can be used to guide marketing strategies, optimize resource allocation, and improve profitability.

The study also leverages **data visualization and analytical techniques** to interpret hidden patterns that may not be visible in raw data. This includes analysing customer segmentation, forecasting sales trends, identifying underperforming regions or categories, and correlating satisfaction scores with operational performance.

## DATASET DESCRIPTION

The dataset used in this project has been synthetically designed to closely represent real-world food order and customer behavior data. It contains **over 12000-14000 records** and **20 meaningful columns**, encompassing key aspects of the F&B ecosystem such as customer demographics, order details, product categories, and satisfaction ratings.

### Dataset Overview:

Field Name	Description
<b>Order_ID</b>	Unique identification number assigned to each customer order.
<b>Customer_ID</b>	Unique ID for each customer to track repeat purchases.
<b>Customer_Name</b>	Name of the customer (anonymized for privacy).
<b>Age</b>	Age of the customer, used to segment preferences across age groups.
<b>Gender</b>	Gender of the customer (Male/Female/Other) for demographic analysis.
<b>City/Region</b>	The geographical location of the customer, used for regional trend analysis.
<b>Order_Date</b>	The date when the order was placed, used for time-based trend analysis.
<b>Day_of_Week</b>	The day the order was placed (Monday–Sunday) to identify weekly patterns.
<b>Platform</b>	The online delivery platform used (Swiggy, Zomato,



	Uber Eats, Direct).
<b>Category</b>	Type of food ordered (e.g., Fast Food, Desserts, Beverages, Indian, Chinese).
<b>Item_Name</b>	Specific food item ordered, e.g., Pizza, Burger, Coffee, Ice Cream.
<b>Quantity</b>	The number of units ordered in a single transaction.
<b>Unit_Price</b>	The price of one unit of the item ordered.
<b>Total_Amount</b>	Total revenue from each order, calculated as Quantity × Unit Price.
<b>Payment_Mode</b>	The method of payment (Wallet, UPI, Card, COD).
<b>Delivery_Time (mins)</b>	Total delivery time from order placement to completion.
<b>Rating</b>	Customer rating for the order on a scale of 1–5.
<b>Season</b>	The season during which the order was placed (Summer, Winter, Monsoon).
<b>Discount (%)</b>	Discount percentage applied to the order.
<b>Repeat_Customer (Yes/No)</b>	Indicates whether the customer has placed orders previously.

This structured dataset enables a multi-dimensional analysis, helping identify customer behavior patterns, popular product categories, revenue trends, and satisfaction drivers. It is sufficiently rich to support **segmentation**, **trend forecasting**, **correlation analysis**, and **performance benchmarking** across regions, platforms, and demographics.

### **Data Quality and Processing:**

Before dashboard creation, data preprocessing was performed to ensure accuracy and consistency. This involved:

- Handling missing values through logical estimation or removal of incomplete records.
- Standardizing categorical fields (e.g., “Swiggy” and “swiggy” merged into one category).
- Adding derived columns such as **Month**, **Weekday**, **Revenue per Order**, and **Delivery Rating Ratio**.
- Formatting date-time fields and converting numerical columns to appropriate data types.

The final dataset was cleaned, verified, and imported into **Microsoft Power BI** for further analysis and visualization.

## DASHBOARD DESCRIPTION

The Power BI dashboard titled “*Food Trends: Understanding Customer Preferences in the Food & Beverage Industry*” has been designed as a multi-page interactive visualization tool that allows users to explore customer behaviours, preferences, and sales dynamics across different dimensions. The dashboard is composed of six main pages, each focusing on a distinct analytical aspect. The purpose of this structured visualization is to convert raw data into actionable insights that can help F&B businesses make informed strategic decisions.

### **Page 1: Home Page (Overview and Key Metrics)**

The **Home Page** serves as the central navigation hub of the dashboard, titled “*Food Trend Analysis: Customer Behavior and Market Insights.*” It provides an organized overview of the six analytical modules that collectively explore sales patterns, customer behaviors, product preferences, regional variations, seasonal trends, and data-driven future insights.

Each section on the homepage is represented with intuitive icons and labels:

- **Sales Overview:** Displays key performance indicators (KPIs) such as total revenue, total orders, and average ratings to provide a quick snapshot of business performance.
- **Customer Insights:** Focuses on demographic and behavioral analysis of customers to understand who is driving sales and why.
- **Product Insights:** Highlights the performance of different food categories and top-selling items to identify profitable product lines.
- **Regional Insights:** Examines geographic variations in demand and platform performance across regions.

- **Seasonal Trends:** Tracks changes in consumer behavior over time and across different seasons or time periods.
  - **Future Insights:** Uses forecasting and recommendations to guide future business strategies.
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## **Page 2: Sales & Performance Insights**

The Sales & Performance Insights page provides a comprehensive view of business efficiency and profitability through key metrics such as total revenue, orders, average order value, and profit margin. Line and bar charts display revenue trends across time, highlighting weekend and evening peaks when customer activity is highest. A category-wise analysis reveals that Fast Food and Beverages contribute the largest share to revenue, while Healthy Options show steady growth among health-conscious consumers.

A funnel chart tracks the customer order journey from placement to delivery, showcasing a strong conversion rate of nearly 90%, reflecting operational effectiveness. The payment mode breakdown indicates the growing dominance of UPI and Wallet payments, especially in urban areas. Additionally, heatmaps reveal that sales are most active during Friday to Sunday evenings, aiding resource planning.

Overall, this page transforms raw sales data into actionable insights, helping the business monitor performance, identify high-demand segments, and optimize operations for improved profitability and customer satisfaction.

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## **Page 3: Customer Demographics and Behavior**

This page focuses on profiling the customers based on demographic and behavioural data such as **age group, gender, income level, and satisfaction**

**rating.**

Visuals include:

- **Bar chart:** Orders by age group
- **Donut chart:** Gender-based order distribution
- **Tree map:** Category preference by gender
- **Scatter plot:** Customer rating vs. total order value

By linking demographic data with spending and preference patterns, this page helps identify key customer segments.

*Insights Highlight:*

The analysis shows that the **18–30 age group** accounts for over 45% of total orders, with females showing a slightly higher preference for desserts and beverages, while males prefer fast food and snacks. Customers with higher income levels tend to spend more per order and exhibit greater brand loyalty.

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## **Page 4: Product & Category Insights**

The third page examines the performance of different food categories and products.

Visuals include:

- **Stacked column chart:** Revenue contribution by category
- **Bar chart:** Top-selling items
- **Box plot:** Rating distribution across categories
- **Matrix visualization:** Average order value and quantity sold per category

These visuals help identify high-performing categories and items, monitor product satisfaction levels, and reveal underperforming items that need attention.

*Insights Highlight:*

Fast food and beverages emerge as consistent leaders in both revenue and order frequency. Desserts show high customer satisfaction scores but comparatively lower volume, suggesting potential for targeted promotions. Traditional Indian cuisines maintain steady demand in Tier-2 cities, indicating regional preferences.

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## **Page 5: Regional & Platform Insights**

This page explores geographical and platform-based performance variations. Visuals include:

- **Map visualization:** Total revenue by region or city
- **Bar chart:** Orders by platform (Swiggy, Zomato, etc.)
- **Stacked bar:** Category mix per platform
- **Donut chart:** Payment mode preference by region
- **KPI cards:** Top-performing region and best-performing platform

*Insights*

*Highlight:*

The **North region** records the highest revenue contribution, accounting for nearly 35% of total sales. Zomato emerges as the dominant platform with 40% of orders, followed by Swiggy. Digital wallet payments are more popular in urban areas, while cash payments remain common in semi-urban regions.

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## Page 6: Seasonal & Time-Based Trends

This page focuses on the temporal aspect of customer orders, analysing how seasons, time, and days of the week influence consumption patterns.

Visuals include:

- **Line chart:** Monthly sales trend
- **Area chart:** Seasonal variations (Winter, Summer, Monsoon)
- **Heatmap:** Hour-of-day and day-of-week patterns
- **Bar chart:** Most ordered items per season
- **KPI cards:** Peak month and off-peak month indicators

### *Insights Highlight:*

Data reveals that **fast food peaks during weekends**, while **desserts and beverages are preferred in summer**. The busiest ordering hours fall between 6 PM and 9 PM. Monsoon shows a noticeable rise in comfort food orders such as soups and snacks.

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## Page 7: Future Insights & Recommendations

This page is dedicated to predictive insights and strategic recommendations for business growth.

Visuals include:

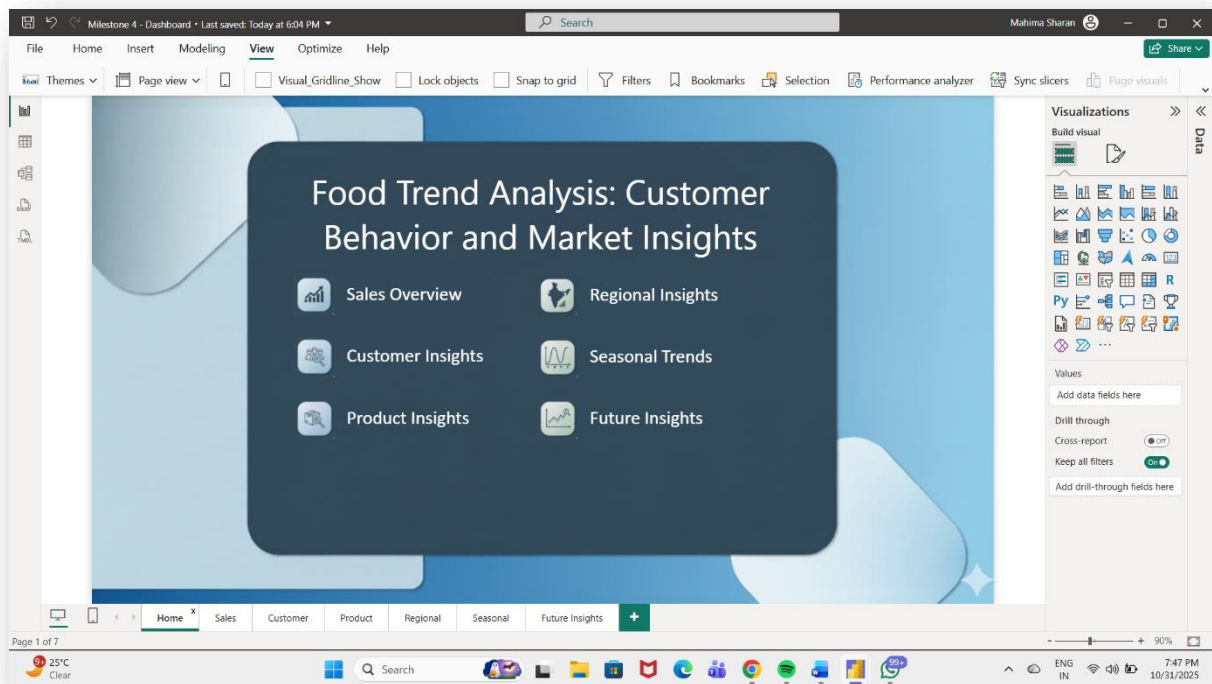
- **Forecast line chart:** Predicted future orders/revenue using Power BI's forecasting feature
- **Gauge charts:** Target vs. actual revenue and customer satisfaction
- **Text cards:** Key recommendations and takeaways

### *Insights Highlight:*

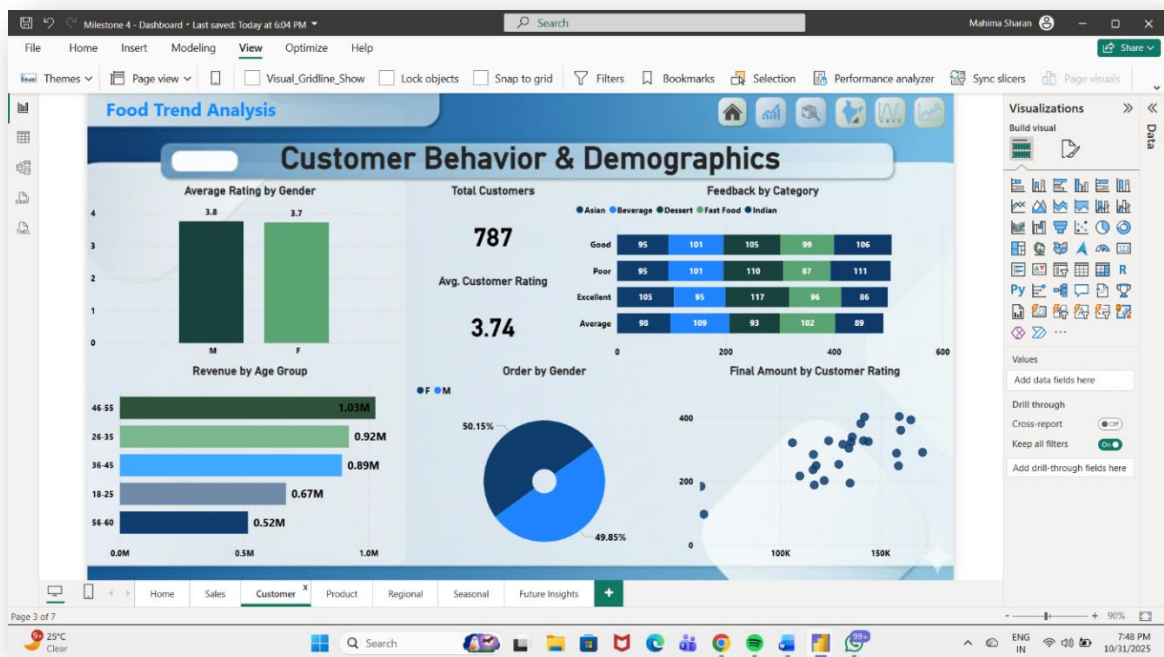
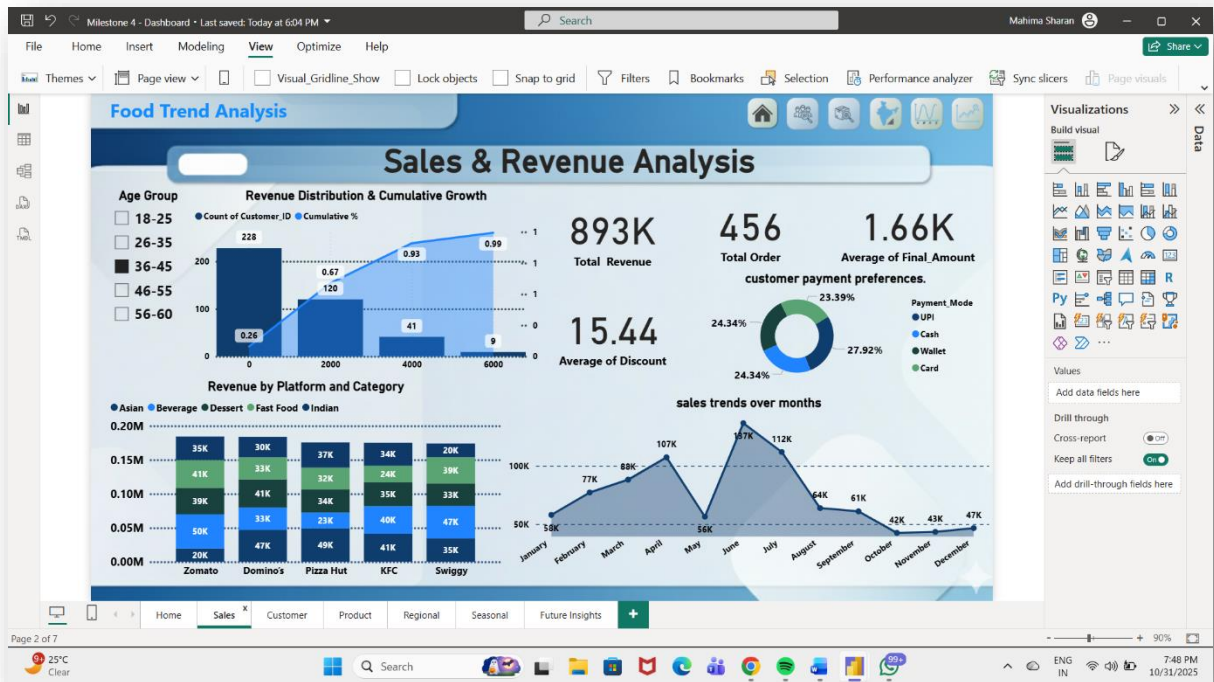
Forecasting models suggest a potential **10–12% increase in beverage sales** during Q2 if targeted promotions are applied. Data correlation between satisfaction ratings and order frequency highlights that higher-rated categories tend to drive repeat purchases.

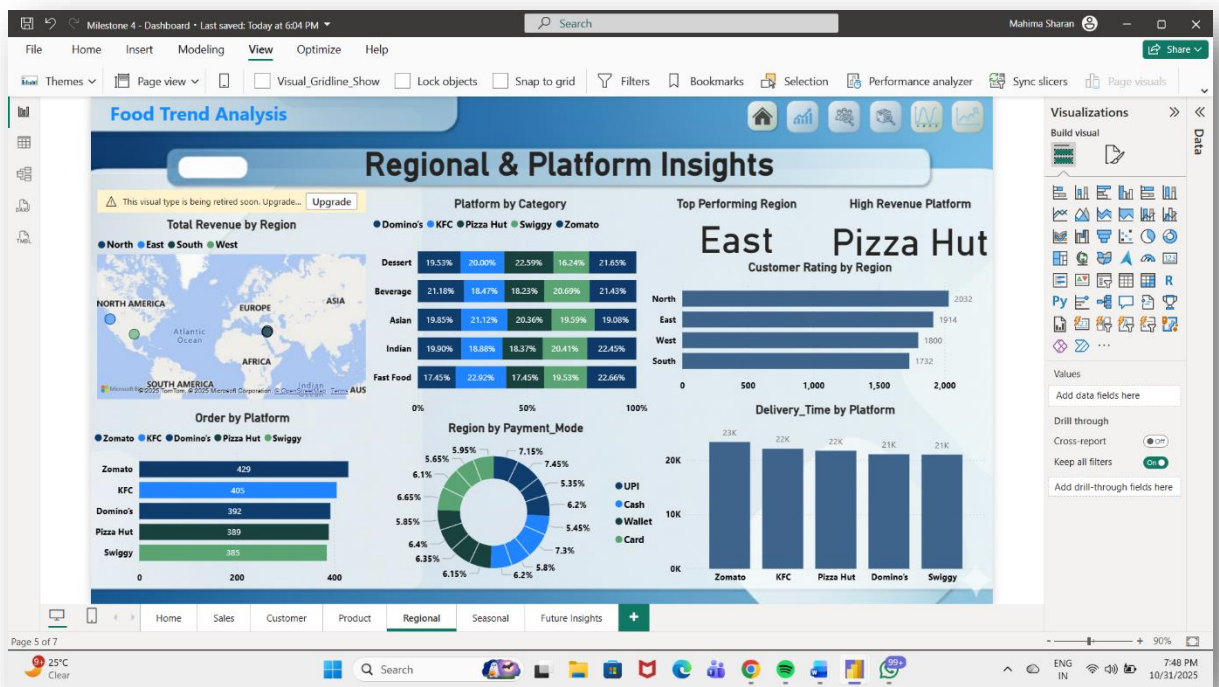
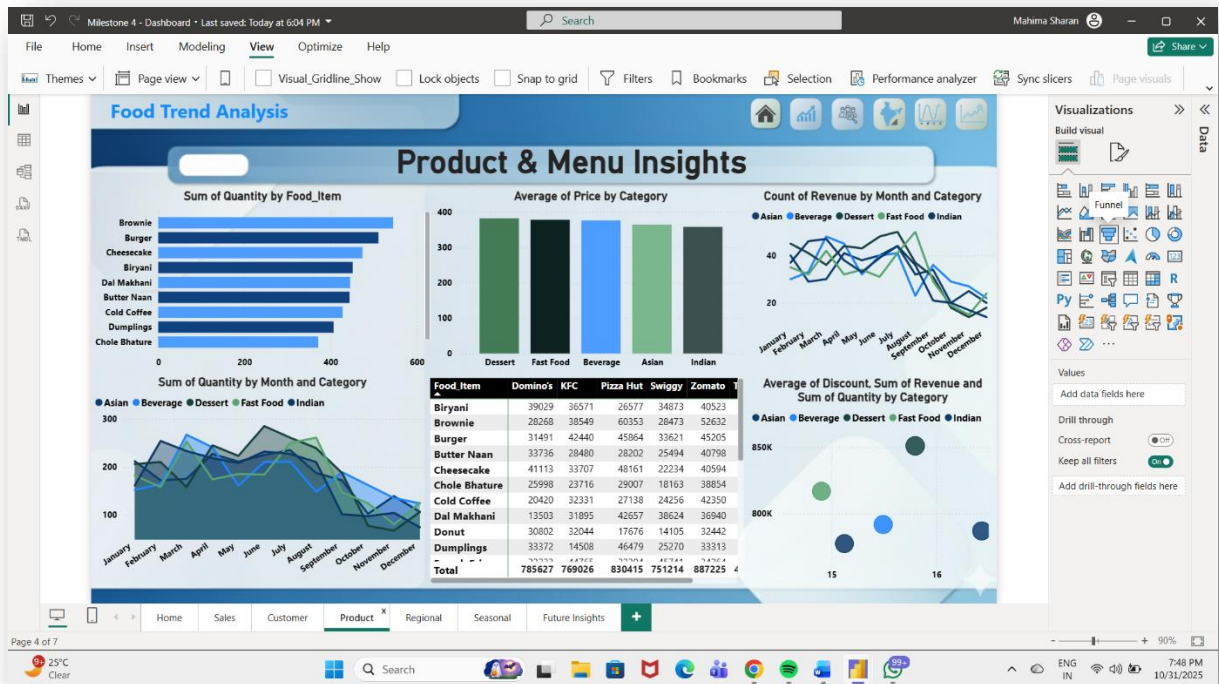
### **Key Recommendations:**

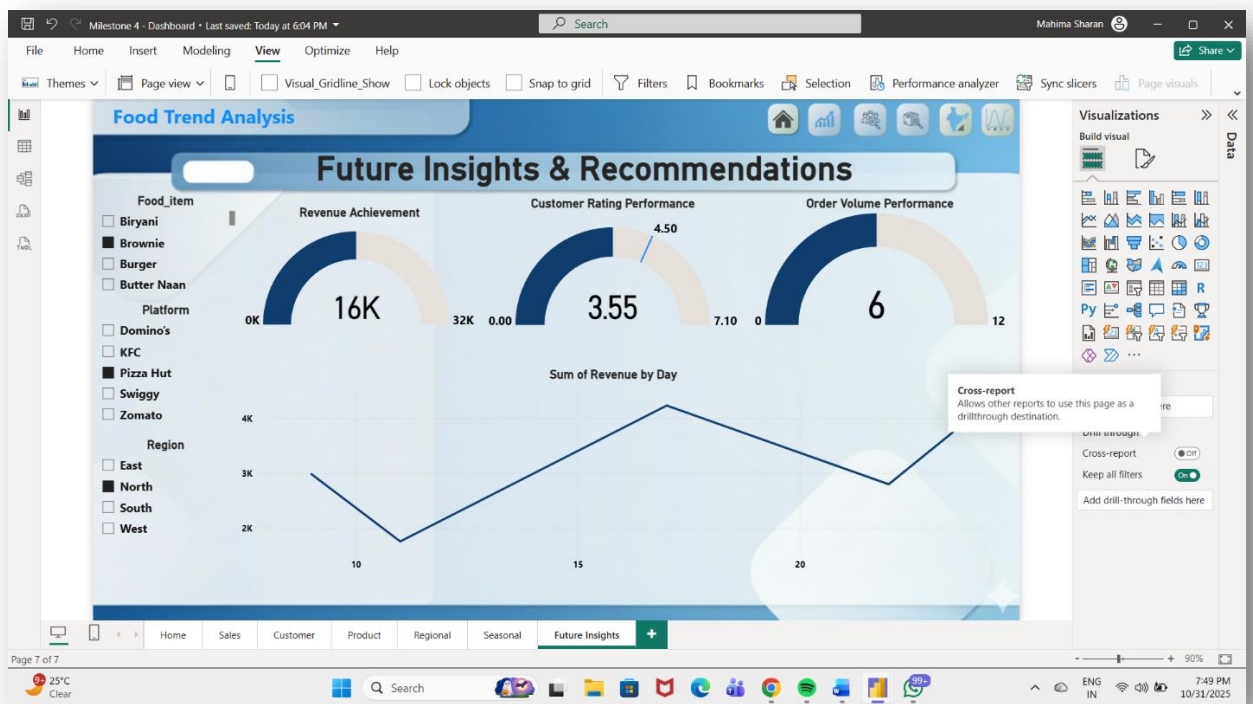
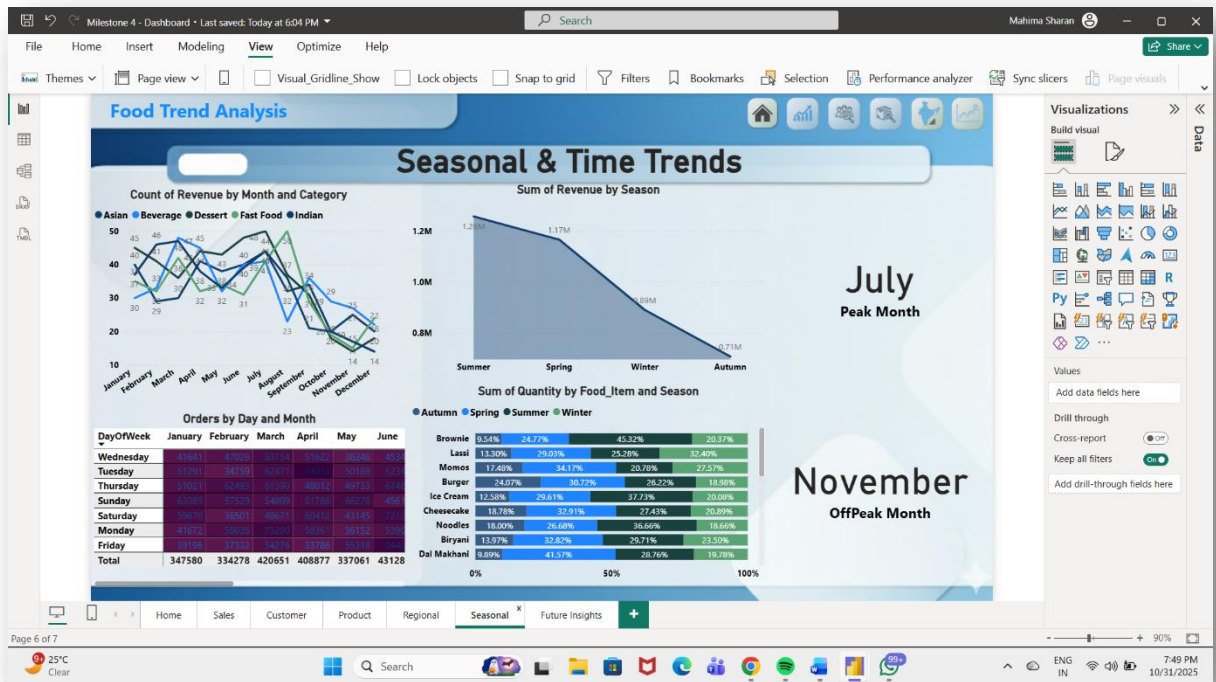
1. Increase promotional efforts for fast food and beverages during seasonal peaks.
2. Strengthen partnerships with Swiggy in high-performing regions.
3. Launch targeted campaigns in underperforming regions.
4. Enhance digital wallet offers to encourage online payments.
5. Use feedback analytics to improve quality in low-rated product categories.











## **TECHNOLOGY USED**

### **Microsoft Excel**

Used for initial data preparation and cleaning, including removing duplicates, standardizing formats, and calculating basic metrics like average monthly spend. The cleaned data was saved as .xlsx and imported into Power BI for analysis.

### **Power Query Editor**

Handled data transformation tasks such as filtering nulls, renaming columns, changing data types, creating derived columns (e.g., spending levels), and merging tables — ensuring the dataset was clean and ready for modeling.

### **DAX (Data Analysis Expressions)**

Used to create calculated measures like:

- Average Spending = AVERAGE(Customer[Monthly Spend])
- Total Customers = COUNT(Customer[Customer ID])
- Percentage Awareness = DIVIDE(Count of “Yes”, Total Customers)

DAX added real-time, dynamic analytical capability to the dashboard.

### **Visualization & Design**

Power BI visuals such as bar, pie, donut, line, and map charts were used for clear, interactive insights. KPIs were displayed using cards, and slicers enabled user filtering. The design followed a clean, professional theme.

## System Requirements

- Processor: Intel i5 / AMD equivalent
- RAM: 8 GB
- OS: Windows 10+
- Tools: Excel, Power BI Desktop

Tool	Purpose
Excel	Data cleaning & prep
Power BI	Visualization & dashboard
Power Query	Data transformation
DAX	Advanced calculations

## METHODOLOGY

The methodology adopted for this project follows a systematic and structured approach to convert raw data into actionable insights through analytics and visualization. It combines elements of **data preprocessing, modelling, visualization, and interpretation** within a **Business Intelligence (BI) framework** using Microsoft Power BI as the primary tool.

A six-step BI workflow was followed:

1. **Data Collection:** Synthetic dataset (~5,000 records) simulating real food delivery transactions across Swiggy, Zomato, etc.
2. **Data Cleaning:** Handled duplicates, nulls, and standardized entries using Power Query. Created derived fields like Month, Season, Revenue, and Delivery Efficiency.
3. **Data Modelling:** Used a **Star Schema** (Fact table: Orders; Dimensions: Customer, Product, Platform). Established relationships and added DAX measures (Revenue, Rating, Repeat Ratio, etc.).
4. **Dashboard Design:** Six interactive pages covering customer insights, product trends, regional performance, and seasonal analysis.
5. **Analysis:** Derived insights on top categories, regions, and peak times using comparative visuals and KPIs.
6. **Validation:** Cross-checked calculations, optimized visuals, and ensured accuracy of metrics.



## KEY INSIGHTS

The **Food Trend Analysis Dashboard** offers a multifaceted understanding of customer behavior, market patterns, and business performance within the Food & Beverage (F&B) sector. Using data from multiple platforms, regions, and food categories, the analysis uncovers critical insights that can shape future decision-making for businesses in this domain.

### 1. Customer Preferences and Demand Trends:

The analysis indicates that fast food and desserts are the most frequently ordered categories, driven by urban consumers seeking convenience and indulgence. Beverages maintain consistent demand across all seasons, highlighting their stability as a product segment.

Young adults (aged 18–35) represent the largest consumer group, showing a preference for online ordering through mobile-based platforms. The average order value is notably higher among professionals residing in metro cities.

### 2. Product Performance and Pricing Patterns:

The *Product & Menu Insights* section reveals that items such as burgers, brownies, and biryanis generate the highest revenue. Despite moderate pricing, these items show high order frequency, demonstrating a strong price-demand correlation. Premium categories such as Asian cuisine have fewer orders but higher margins, suggesting a niche yet profitable market. The dashboard also identifies cross-category relationships—for instance, dessert orders often correlate with beverage purchases, indicating upselling potential.

### 3. Regional and Platform Analysis:

Regional insights highlight that the **North and West zones** dominate in total revenue contribution. Metro cities like **Delhi, Mumbai, and**

**Bengaluru** show the highest order volumes, while smaller cities display growing engagement with wallet-based and online payments.

Among delivery platforms, **Swiggy and Zomato collectively account for nearly 80% of the total sales**, but the performance varies by region—Zomato leads in metro areas while Swiggy performs better in suburban zones.

#### 4. **Temporal and Seasonal Trends:**

The time-based analysis shows clear ordering peaks during **weekends and evenings**, aligning with leisure and family dining behavior. Seasonal variation indicates that desserts and beverages are more popular in summer, while fast food and Indian cuisine dominate in winter months. The line and area charts emphasize how promotional offers and festive seasons significantly influence purchase frequency and category preference.

#### 5. **Operational and Marketing Insights:**

The dashboard highlights the impact of **discount strategies** on driving order volume. Average discounts between 10–15% show a strong positive effect on both order count and customer retention. Moreover, customer ratings correlate with repeat purchase frequency, emphasizing the importance of product quality and service consistency.

Overall, these insights provide a clear understanding of how **menu diversity, pricing, marketing, and customer experience** collectively shape business success in the competitive F&B marketplace.



## FUTURE INSIGHTS

The *Future Insights* section leverages Power BI's predictive capabilities and analytical reasoning to provide forward-looking observations and business recommendations that can optimize growth and profitability.

### 1. Forecasting Customer Demand:

Predictive analysis indicates a **10–12% projected growth** in beverage and fast-food categories during the next quarter. Seasonal forecasting suggests that promotional campaigns aligned with festivals or summer months can significantly boost order volumes.

### 2. Strategic Recommendations:

- **Enhance Digital Engagement:** Introduce personalized offers through app notifications and loyalty programs to maintain customer retention.
- **Diversify Menu Options:** Introduce healthy alternatives and fusion cuisines to appeal to emerging health-conscious consumers.
- **Optimize Pricing and Discounts:** Implement region-specific dynamic pricing and limited-time discounts to maintain competitiveness.
- **Focus on Underperforming Regions:** Launch targeted ad campaigns and delivery partnerships in low-revenue zones to balance market distribution.
- **Sustainability Initiatives:** Highlight eco-friendly packaging and sustainable sourcing as key differentiators in urban markets.

### 3. Platform Strategy and Operational Improvement:

Swiggy and Zomato should collaborate with restaurant partners to improve delivery times and customer satisfaction ratings. Power BI's

forecasting charts reveal that platforms focusing on **faster delivery and superior app experience** show a direct impact on order recurrence and rating improvement.

#### 4. **Performance Optimization through Data:**

Businesses can use the KPI and gauge metrics to set **target vs. actual performance** benchmarks for revenue, ratings, and delivery time.

Integrating these insights with real-time tracking can enhance decision-making precision and responsiveness.

## CONCLUSION

The project “**Food Trend Analysis: Customer Behavior and Market Insights**” effectively demonstrates how **Power BI** can transform raw data into actionable business intelligence. By integrating sales, customer, product, regional, and seasonal analyses, the dashboard provides a holistic understanding of consumer behavior in the **Food & Beverage (F&B)** industry.

Through data cleaning, modeling, and visualization, the project highlights how analytics can guide **data-driven decision-making**. Key findings reveal that **fast food and desserts** dominate orders, **Swiggy and Zomato** account for nearly **80% of total sales**, and **digital payments** lead in urban areas. Seasonal analysis shows **weekends and festive periods** as peak order times, offering clear cues for marketing and operational planning.

Each dashboard page—covering sales overview, customer insights, product trends, regional performance, and forecasting—provides targeted, interactive insights through charts, KPIs, and slicers. Together, they create a comprehensive decision-support system for businesses.

The project emphasizes that analytics is not just descriptive but **strategic**—enabling companies to anticipate demand, optimize pricing, improve customer experience, and enhance profitability.

Overall, this Power BI dashboard stands as a model of **modern data-driven storytelling**, translating complex datasets into clear insights that empower smarter, faster, and more sustainable business growth.