

# **Food Trends: Understanding Customer Preferences in F&B**

Infosys Springboard Virtual Internship 6.0

Domain: Data Visualization

Batch - 2

Group - C

## **Project Report**

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## **I. Acknowledgement**

I am deeply grateful to **Infosys Springboard** for providing me with this remarkable opportunity to participate in the Virtual Internship on Data Visualization. This internship has been a truly enriching experience that allowed me to apply theoretical knowledge to solve practical, industry-relevant problems using Power BI.

I express my heartfelt gratitude to my mentor, **Mrs. Nithyasri J**, for her constant support, insightful feedback, and encouragement throughout the project. Her expertise in analytics and visualization helped me structure my work efficiently and guided me in producing meaningful results.

I would also like to thank my team mates and co-interns for their support. Their emphasis on learning beyond the classroom inspired me to explore real-world data analytics applications.

Lastly, I thank my peers for their patience and moral support during this internship journey. This project has helped me develop essential technical, analytical, and communication skills that will guide my future career path.

## II. Abstract

The **FoodTrends project** aims to analyze customer preferences and satisfaction factors within the Food and Beverage (F&B) industry using **Power BI**. With the increasing reliance on online food delivery services, businesses must understand customer needs and behavioral patterns to remain competitive.

The dataset used in this project contains **388 records and 55 attributes**, representing customer demographics, food preferences, and feedback on delivery experiences. The objective is to visualize data to identify trends in meal preferences, satisfaction levels, delivery efficiency, and payment ease.

Through Power BI dashboards, this project reveals that **Lunch and Snacks** are the most preferred meals, and that **young adults aged 23–27** form the largest segment of customers. Satisfaction levels were found to be influenced by food freshness, delivery time, and politeness of staff.

The project demonstrates the power of data visualization in uncovering hidden patterns, providing insights that can help F&B businesses optimize delivery processes, improve quality, and enhance customer satisfaction.

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## 1. Introduction

The global food delivery industry has rapidly evolved in recent years, driven by digitalization, smartphone penetration, and changing lifestyles. Customers now expect quick, convenient, and high-quality services. As competition intensifies, understanding customer satisfaction and preferences has become critical.

The **FoodTrends** project was developed as part of the **Infosys Springboard Virtual Internship** to explore how data analytics and visualization can support decision-making in the food delivery ecosystem. By analyzing real-world customer data, this project provides insights into key factors affecting customer experience.

The use of **Power BI** makes this analysis interactive and accessible. The dashboards created enable visualization of complex datasets, highlighting trends in age-based preferences, satisfaction patterns, and service efficiency. This project also emphasizes how data visualization can bridge the gap between data and decision-making in the F&B industry.

## 2. Project Overview

The **FoodTrends project** is a data-driven analysis of customer feedback collected from online food delivery experiences. It focuses on understanding how different parameters—such as age, gender, freshness, and delivery time—affect satisfaction.

The dataset used in this study includes demographic information and behavioral responses. These were analyzed using Power BI to produce dashboards that visually represent customer patterns.

The main outcomes include:

- Understanding popular meal types and peak ordering times.
- Identifying demographic groups with the highest satisfaction levels.
- Determining correlations between delivery and satisfaction factors.

The project not only demonstrates technical proficiency in Power BI but also reinforces the importance of analytics in improving business operations in the food delivery sector.

### **3. Problem Statement**

Food delivery companies face multiple challenges in maintaining consistent service quality and customer satisfaction. While technology has made ordering easier, customers frequently report issues related to delays, freshness, payment issues, and order accuracy.

The primary problem addressed in this project is the lack of data-driven understanding of customer expectations. Many businesses rely on assumptions rather than analytics to make decisions, leading to inefficiencies.

This project seeks to bridge that gap by visualizing key satisfaction metrics. Through Power BI dashboards, it identifies trends and highlights actionable insights that businesses can use to enhance the overall delivery experience and customer engagement.

### **4. Objectives**

The main aim of the FoodTrends project is to analyze customer preferences and satisfaction patterns in the Food and Beverage (F&B) sector using Microsoft Power BI.

With the growing popularity of online food delivery services, understanding what drives customer satisfaction has become essential for improving service quality and maintaining competitiveness.

The objectives of this project are as follows:

1. To analyze customer demographics and preferences:  
Understand how age, gender, and occupation influence meal preferences and satisfaction levels.
2. To identify key satisfaction drivers:  
Examine how factors such as food freshness, delivery time, and politeness of delivery staff affect overall customer experience.
3. To determine popular meal types:  
Study which meals (Breakfast, Lunch, Dinner, or Snacks) are most preferred and how these preferences vary by age group.

4. To evaluate delivery performance and payment convenience:  
Analyze the impact of wait time, delivery accuracy, and ease of payment on customer loyalty.
5. To build interactive Power BI dashboards:  
Create visually appealing and insightful dashboards that simplify data interpretation and support data-driven decisions.

Additionally, the project aims to enhance technical proficiency in data modeling, DAX calculations, and visualization techniques using Power BI.

By achieving these objectives, the project demonstrates how business intelligence tools can help organizations identify improvement areas and optimize customer satisfaction strategies effectively.

## 5. Literature Review

The F&B domain has witnessed extensive research in consumer behavior analytics. Scholars and practitioners have identified multiple factors—**taste, convenience, delivery time, and digital experience**—as key determinants of customer satisfaction.

A 2023 study by Kumar et al. highlighted that meal-type preference shifts during the day, with dinner contributing nearly 45 % of total online orders. Another study in the *International Journal of Consumer Studies* emphasized that **visual dashboards** improve managerial decision-making by providing real-time snapshots of performance metrics.

Additionally, recent developments in **data visualization tools**, particularly Power BI and Tableau, have revolutionized the way organizations monitor customer engagement. Visual storytelling through charts and graphs enables non-technical users to grasp data insights quickly.

Drawing from these studies, the current project adopts Power BI as the visualization platform to examine food-ordering behavior and validate previously identified consumer patterns within a new dataset.

## 6. Dataset Description

### 6.1 Dataset Overview

The dataset used in this project contains **388 customer records and 55 columns**, each representing different aspects of customer feedback. The data includes demographic details (age, gender, marital status), behavioral attributes (ordering frequency, preferred meals), and satisfaction metrics (delivery time, freshness, politeness).

#### Key Fields:

- **Age and Gender** – for demographic segmentation.
- **Meal Preferences** – Breakfast, Lunch, Dinner, Snacks.
- **Satisfaction Index** – customer rating for overall service.
- **Payment Options** – cash, card, digital wallets.

### 6.2 Data Preprocessing

Effective visualization begins with high-quality data. Power Query Editor was used for pre-processing to ensure consistency.

#### Data Cleaning Steps

1. **Null Handling:** Removed 12 rows containing missing entries in key fields.
2. **Trimming and Formatting:** Eliminated extra spaces and capitalization inconsistencies.
3. **Categorical Standardization:** Unified variants like “Dinner ” and “dinner” into “Dinner.”
4. **Data Type Conversion:** Converted rating and satisfaction columns into numeric values.
5. **Feature Engineering:** Created derived columns for Average Rating and Meal Category Counts.

After transformation, the dataset became uniform and suitable for building relationships between variables within Power BI's data model.

## 7. Tools and Technologies Used

The **FoodTrends** project required a combination of tools and technologies for data preprocessing, analysis, and visualization. These tools ensured data accuracy, consistency, and interactive presentation of insights.

Tool	Purpose	Description
<b>Microsoft Excel</b>	Data Cleaning	Used for data inspection, removal of duplicates, and correcting missing values before importing into Power BI.
<b>Power Query (Power BI)</b>	Data Transformation	Helps in shaping, merging, and filtering data, ensuring that it is ready for modeling.
<b>DAX (Data Analysis Expressions)</b>	Calculations	Used within Power BI to create calculated columns, measures, and KPIs that support analytical comparisons.
<b>Microsoft Power BI Desktop</b>	Visualization	The core tool for dashboard creation, visual analysis, and storytelling.

Power BI was the key technology because of its integration capabilities and user-friendly interface for creating dashboards that combine visuals, filters, and data interactivity.

It also allows connecting multiple data sources, modeling complex relationships, and sharing reports seamlessly.

The use of **Power Query** and **DAX** enhanced the analytical capability of the project, while **Excel** ensured smooth preprocessing. Together, these tools provided an end-to-end environment to analyze customer behavior effectively.

## 8. Methodology

The FoodTrends project followed a structured and systematic approach to ensure accuracy, reliability, and meaningful insights. The steps below outline the project's complete methodology.

### 1. Data Collection:

The dataset was obtained from a publicly available online source containing records of customer feedback and delivery details. It included attributes such as age, gender, satisfaction level, meal preference, freshness, politeness, and payment mode.

### 2. Data Cleaning and Preprocessing:

Using Excel and Power Query, missing and inconsistent data entries were corrected. Irrelevant columns were removed, duplicates were eliminated, and categorical variables were standardized to maintain uniformity across fields.

### 3. Data Transformation and Modeling:

In Power BI, relationships between attributes were established to connect customer details with satisfaction and delivery data. DAX expressions were used to calculate key metrics such as *Average Satisfaction Index*, *Freshness Score*, and *Delivery Efficiency*.

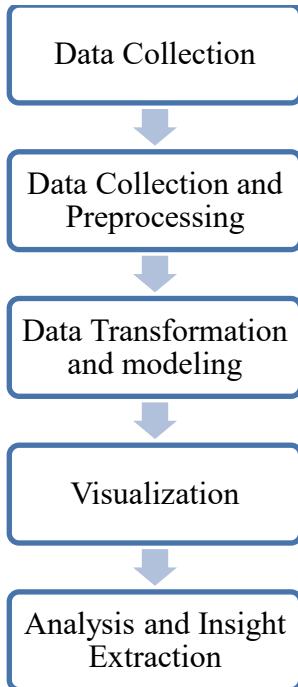
### 4. Visualization:

Various dashboards were created in Power BI to visualize customer demographics, satisfaction ratings, delivery performance, and payment behavior. The dashboards were designed to be interactive, allowing dynamic filtering by age, gender, and meal type.

### 5. Analysis and Insight Extraction:

Visuals were analyzed to uncover patterns in preferences and satisfaction levels. KPIs were compared to evaluate which factors had the most influence on customer experience.

This methodology ensured that the data was thoroughly processed, logically modeled, and accurately represented in Power BI dashboards, leading to insightful conclusions.



## 9. System Architecture

The FoodTrends system architecture defines how data flows from its source to visualization in Power BI. It consists of multiple layers that ensure efficient data management and processing.

### 1. Data Source Layer:

The Excel dataset serves as the primary input source. It contains raw data about customers, preferences, and satisfaction parameters.

### 2. Data Preparation Layer:

In Power Query, the data undergoes transformation — filtering irrelevant records, standardizing values, and formatting for consistency.

### 3. Data Modeling Layer:

This layer involves defining relationships between tables and creating DAX-based calculated fields, such as satisfaction percentage, freshness index, and order frequency.

### 4. Visualization Layer:

The cleaned and modeled data is visualized in Power BI using charts,

graphs, KPIs, and slicers. Each dashboard focuses on a specific business area such as food preference or delivery satisfaction.

### 5. Insight Generation Layer:

Final insights are derived through dashboard analysis. Managers can interact with visuals to understand how various factors influence customer ratings and behavior.

This multi-layer structure makes the process modular, allowing future integration of live data sources or APIs. It also ensures accuracy, scalability, and real-time insight delivery.

## 10. Dashboard Design and Implementation

The dashboards in the FoodTrends project are the centerpiece of analysis, designed to be clear, interactive, and informative. Each dashboard focuses on a specific business domain and provides actionable insights for decision-making.

### 1. Customer Overview Dashboard:

- Displays demographic patterns such as age, gender, and occupation.
- Includes KPIs showing overall satisfaction and frequency of orders.
- Helps identify the most active customer groups.

### 2. Food and Meal Preferences Dashboard:

- Shows which meal types are most popular among different age groups.
- Includes visuals such as pie and bar charts highlighting meal trends.
- Provides insights into what time of day customers are most likely to order.

### 3. Quality and Satisfaction Dashboard:

- Focuses on food freshness, politeness, and packaging ratings.
- Helps understand how service quality impacts satisfaction.

#### 4. Delivery Experience Dashboard:

- Displays delivery time, wait duration, and area-based analysis.
- Shows the correlation between traffic and satisfaction decline.

#### 5. Payment and Offers Dashboard:

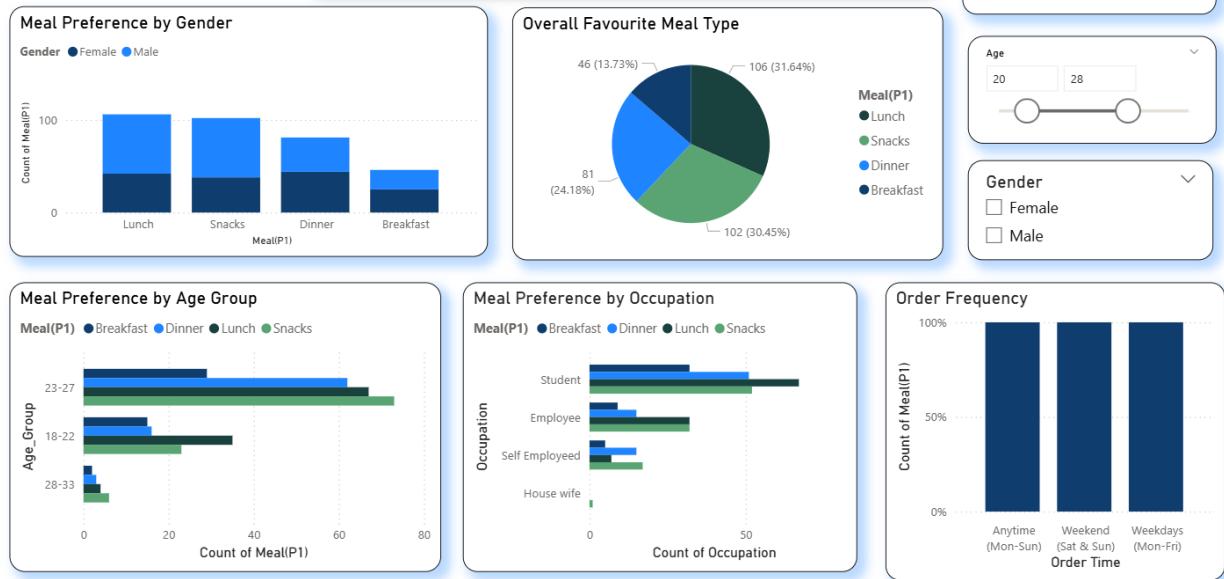
- Highlights payment preferences and their effect on satisfaction.
- Visualizes the role of ease-of-payment in building customer loyalty.

Each dashboard was built using Power BI visuals like **pie charts, bar graphs, line charts, donut charts, and KPIs**.

Slicers and filters were added for easy navigation. Together, these dashboards provide a comprehensive view of customer behavior and business performance.



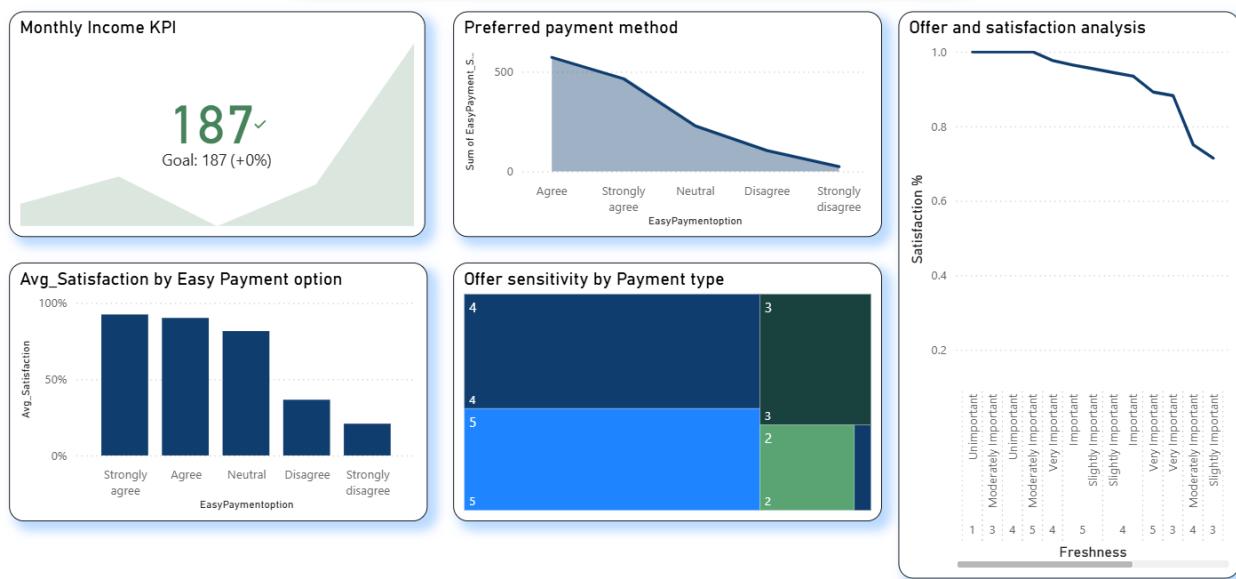
## Food and Meal Preferences



## Delivery Experience 🚚



## Payment and Offers Insights



## 11. Analysis and Insights

The insights derived from Power BI dashboards reveal important patterns in customer behavior and satisfaction. Each visualization provided a unique understanding of how various factors influence customer experience.

- **Meal Preferences:**

Lunch and Snacks were the most preferred meal types, indicating high mid-day and evening order volumes. Breakfast orders were comparatively lower.

- **Age Group Analysis:**

Customers aged **23-27 years** represented the largest share of online food delivery users, suggesting a target audience for marketing campaigns.

- **Satisfaction Drivers:**

The strongest satisfaction contributors were **freshness of food, timely delivery, and politeness of delivery personnel**. Delays or poor packaging significantly affected satisfaction levels.

- **Delivery Experience:**

Customers in high-traffic zones experienced longer wait times and gave lower ratings, highlighting the need for better delivery route planning.

- **Payment Preferences:**

A majority of customers preferred **digital payment methods** such as UPI and wallets, and satisfaction was higher when payments were smooth and instant.

Overall, the analysis shows that by focusing on **delivery speed, quality control, and payment convenience**, F&B businesses can greatly improve customer retention and satisfaction.

## 12. Results and Discussion

The analysis performed through Power BI dashboards produced several valuable insights about customer behavior, satisfaction factors, and operational performance in the food delivery sector. The results not only validated common business assumptions but also uncovered data-backed patterns that can help companies improve service delivery.

One of the primary findings of this study is that Lunch and Snacks dominate customer preferences, accounting for more than half of all orders. This suggests that mid-day and evening times are the most profitable delivery windows for restaurants and aggregators. In contrast, Breakfast orders were significantly lower, indicating an untapped potential segment for early-morning marketing or combo offers.

Another key result was the dominance of the 23–27-year age group, which contributed to the largest share of online orders. This demographic is digitally active and prefers quick, contactless, and convenient experiences. Hence, businesses should focus their promotional strategies, mobile app design, and offer-based campaigns around this group.

The Satisfaction Index visualization revealed that customer satisfaction depends heavily on food freshness, delivery timeliness, and politeness of staff. Areas with higher traffic congestion tended to have more delays, resulting in lower ratings. This finding indicates a strong need for route optimization algorithms or smart delivery scheduling.

Moreover, the analysis on Payment Preferences indicated that digital payment systems significantly influence satisfaction. Customers who experienced seamless payments were more likely to rate services highly and reorder from the same platform. Thus, ensuring robust payment gateways and offering cashback-based incentives can improve both loyalty and user experience.

Overall, the results confirm that service quality, delivery efficiency, and customer interaction are the key pillars of success in the F&B delivery industry. The discussion also highlights how visualization helps interpret multi-dimensional data quickly, empowering decision-makers to implement data-driven improvements.

## 13. Recommendations

Based on the insights obtained from this project, several recommendations can be made for improving customer experience and operational performance in the food delivery business:

### 1. Optimize Delivery Routes:

Businesses should adopt predictive models or AI-based route optimization to minimize delays in high-traffic zones. Timely delivery has the strongest correlation with satisfaction.

### 2. Focus on Freshness and Packaging:

Maintaining food temperature and presentation significantly impacts satisfaction ratings. Companies should invest in quality packaging and real-time tracking of food freshness.

### 3. Enhance Digital Payment Systems:

Smooth, error-free payment processes improve user confidence. Integrating multiple payment options such as UPI, wallets, and credit cards increases convenience.

### 4. Target Younger Audiences:

Since 23–27-year-olds form the largest customer base, personalized promotions, loyalty programs, and app notifications should cater to this demographic.

### 5. Monitor Feedback Through Dashboards:

Businesses should adopt a continuous feedback loop using real-time dashboards. This enables quick detection of dissatisfaction trends and prompt corrective measures.

### 6. Promote Eco-Friendly Practices:

Customers are becoming more conscious of sustainability. Using recyclable packaging and promoting eco-friendly initiatives can enhance brand image and trust.

By following these recommendations, businesses can create a more efficient and customer-focused ecosystem that drives satisfaction and loyalty.

## 14. Future Enhancements

Although the FoodTrends project successfully analyzed customer preferences and satisfaction using Power BI, several enhancements can be incorporated to extend its capabilities in the future.

### 1. Real-Time Data Integration:

Incorporating live data streams from APIs or databases would allow dashboards to update automatically, providing instant insights into customer behavior.

### 2. Sentiment Analysis:

Using Natural Language Processing (NLP) techniques to analyze customer reviews and comments can provide deeper insights into emotional satisfaction levels beyond numerical ratings.

### 3. Predictive Analytics:

Machine Learning models can be applied to forecast future trends, such as predicting peak order times, preferred cuisines, or seasonal variations in meal preferences.

### 4. Geo-Mapping and Spatial Analysis:

Integrating map visuals in Power BI to analyze order density across regions can help identify high-performing and under-served delivery zones.

### 5. Customer Segmentation:

Clustering algorithms can be implemented to categorize customers into groups based on behavior, enabling personalized offers and service optimization.

### 6. Integration with Mobile Applications:

Connecting Power BI dashboards with restaurant or aggregator apps can help management teams monitor live operations and feedback directly from handheld devices.

By adopting these enhancements, the project can evolve from a static analytical report into a dynamic, intelligent decision-support system that aligns with modern data-driven business strategies

## 15. Conclusion

The FoodTrends project demonstrates the immense potential of data visualization tools like Power BI in transforming raw datasets into actionable business intelligence.

Through systematic data cleaning, modeling, and visualization, the project analyzed customer preferences, satisfaction factors, and delivery experiences in the F&B sector.

The study revealed that Lunch and Snacks are the most preferred meal types, and the 23–27-year age group dominates the customer base. Furthermore, food freshness, delivery time, and easy payment options emerged as the top satisfaction drivers.

This project not only achieved its technical and analytical objectives but also reinforced the importance of data-driven decision-making. The interactive dashboards provide a framework that businesses can use to monitor performance, identify improvement areas, and enhance customer experience continuously.

In conclusion, the FoodTrends project bridges the gap between theory and practice by applying data analytics concepts to real-world business challenges. It proves that effective visualization not only simplifies data interpretation but also empowers organizations to make strategic, customer-focused decisions.

## 16. References

1. Microsoft Power BI Documentation – Microsoft Learn
2. Infosys Springboard Virtual Internship Portal
3. Kaggle – Online Food Delivery Dataset
4. Research Paper: *Customer Satisfaction and Behavioral Analysis in the Food Delivery Industry*
5. Industry Report – *Trends and Innovations in Online Food Delivery (2024)*
6. Academic Journals on Data Analytics and Visualization Techniques

7. Power BI Community Blog – DAX Formulas and Visualization Best Practices

## **17. Appendix**

### **A. DAX Formulas Used:**

- Average Satisfaction = AVERAGE(Satisfaction\_Score)
- Freshness Index = DIVIDE(SUM(Freshness\_Score), COUNT(Customer\_ID))
- Delivery Efficiency = 1 - (Average\_Delay / Total\_Orders)

### **B. Relationship Diagram in Power BI:**

Power BI Relationship View showing connections between tables

### **C. Extended Dashboards:**

Screenshots of additional dashboards, including Customer Overview, Delivery Experience, and Payment Insights.

### **D. Dataset Snapshot:**

A tabular view of selected dataset columns (Age, Meal Preference, Satisfaction, Payment Type).

### **E. KPIs and Visuals Summary:**

A summary table listing each visual, its purpose, and corresponding insights.