Cuisine, Customers, and Data: A Recipe for Enhancing Customer Experience at FoodHub

Project 1:FoodHUB
Course Name: AIML

Date:08/Mar/2024

Contents / Agenda

- Executive Summary
- Business Problem Overview and Solution Approach
- Data Overview
- EDA - Univariate Analysis
- EDA - Multivariate Analysis
- Appendix

Executive Summary

Introduction:

As FoodHub continues to cater to the evolving demands of New York city's diverse clientele, an in-depth analysis of 1,898 unique orders has been conducted. This analysis spans across various dimensions such as cuisine preferences, customer feedback, operational metrics, and revenue generation. The goal is to harness these insights to refine their strategies, enhance customer satisfaction, and drive business growth.

Diverse Customer Base: High number of orders and repeat customers demonstrate strong customer loyalty and popularity

Cuisine Popularity: American, Japanese, Italian, and Chinese cuisines are top choices, with American cuisine most popular on weekends

Feedback and Ratings: Feedback shows general satisfaction, with most ratings at 4 or 5 stars

Operational Efficiency: Operations are efficient, with room for further improvement

Revenue Opportunities: Opportunity to boost revenue by promoting higher-value orders

Executive Summary Key Recommendations

Enhancing FoodHub's Services Through Strategic Initiatives

Promote High-Quality Restaurants

- Highlight top-rated restaurants to boost satisfaction

Incentivize High-Value Orders

- Encourage larger orders with promotions and loyalty rewards

Optimize Delivery Logistics

- Improve delivery efficiency, especially during peak times

Smart Food Preparation

- Promote predictive prep of popular dishes to boost efficiency without sacrificing quality

Executive Summary Key Recommendations

Enhancing FoodHub's Services Through Strategic Initiatives

Engage Customers for Feedback

- Increase feedback collection through incentives

Expand Cuisine Offerings

- Diversify cuisine options to meet varied customer tastes

Weekend Delivery Strategy

- Adjust delivery strategies for faster weekend service

Weekend Delivery Strategy

- Adjust delivery strategies for faster weekend service

Executive Summary Conclusion

Conclusion:

This analysis not only highlights FoodHub's strengths in meeting the diverse needs of its customer base but also identifies strategic opportunities for improvement. By focusing on quality, efficiency, and customer engagement, FoodHub can further solidify its position as a leader in the New York food delivery market. Implementing the recommended strategies will not only enhance the customer experience but also contribute to sustainable business growth.

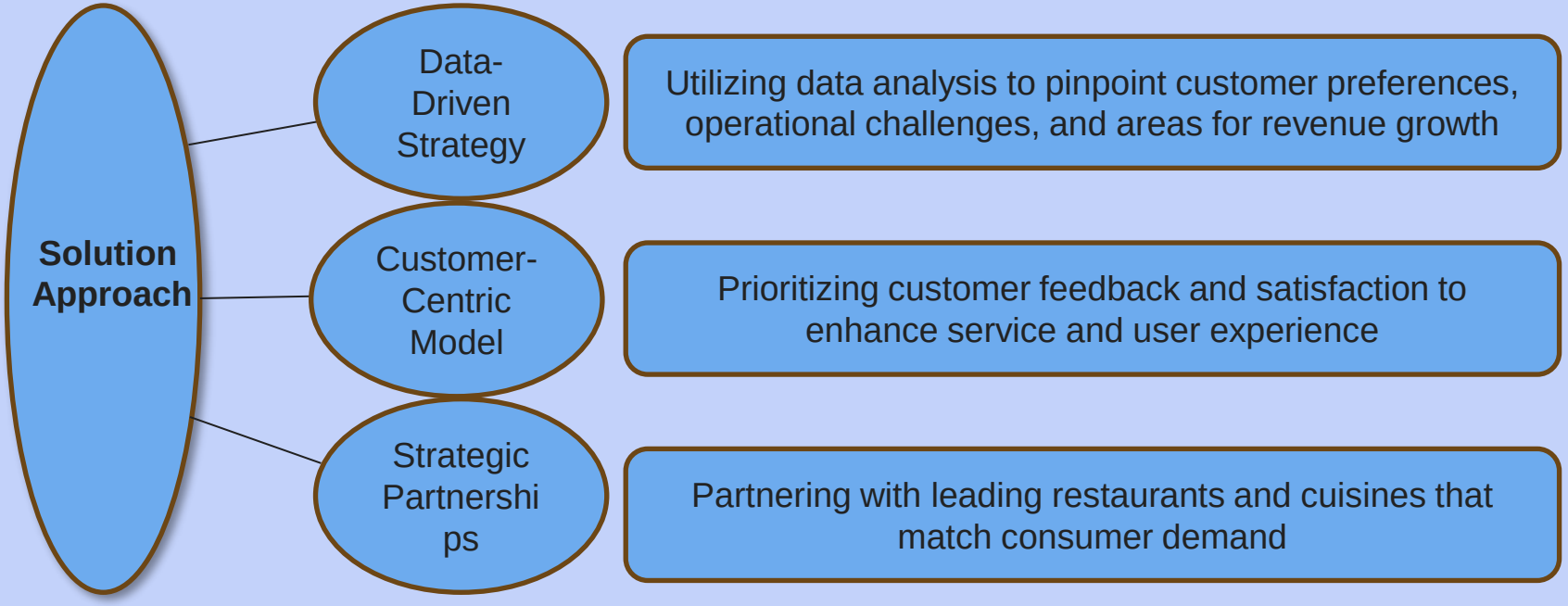
Business Problem Overview

Addressing the Dynamics of Food Delivery in New York

The Challenge at Hand

1. **Rapid Market Evolution**: New York's food delivery sector is growing quickly, with ever-changing consumer preferences
2. **Competitive Landscape:** The rise in restaurants and delivery platforms makes it hard to stand out and keep customers loyal
3. **Operational Efficiency:** Delivering timely, quality service while managing varying demand and customer expectations is crucial

Solution Approach for Business Problem



Application of Solution Approach

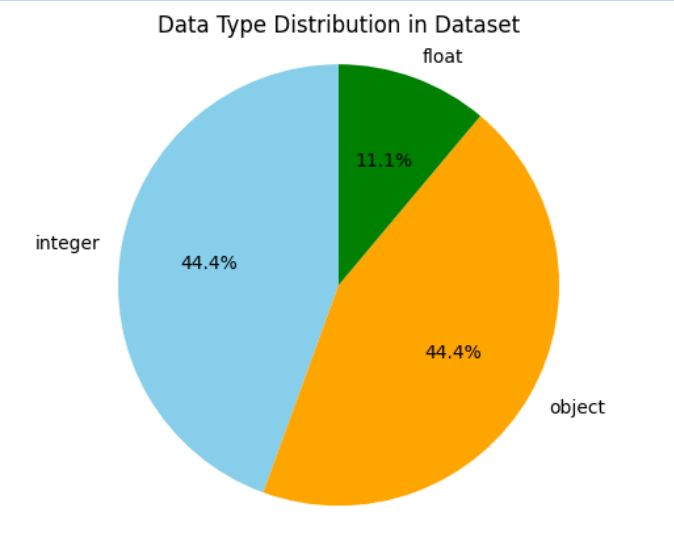
Methodology

- **Data Analysis:** Employing statistics and visuals to analyze order trends, cuisine preferences, and delivery speeds
- **Key Metrics:** Focusing on order volume, prep time, delivery speed, and customer feedback

Anticipated benefits

- **Customer Experience:** Personalizing service based on customer insights improves satisfaction
- **Revenue Growth:** Data-driven promotions and partnerships boost order value and frequency
- **Operational Excellence:** Streamlining routes and processes cuts wait times and enhances food quality, boosting ratings and retention

Comprehensive Data Overview



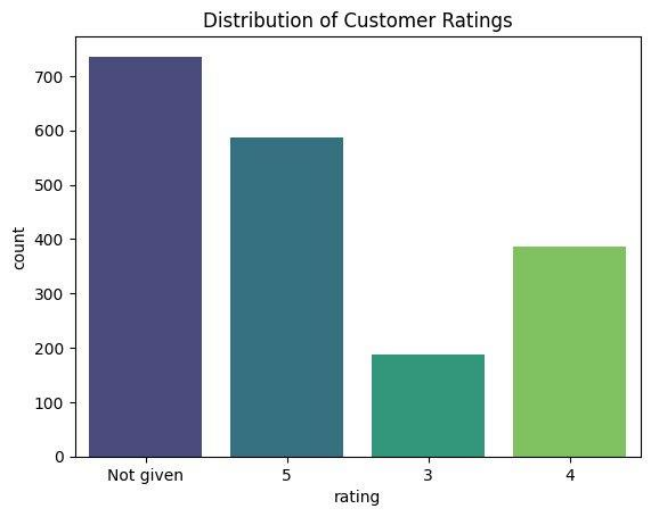
Dataset Composition

- **Scope of Analysis:** The dataset includes 1,898 unique food orders, each characterized by 9 diverse columns.
- **Data Diversity:** With a mix of 4 integer, 4 object, and 1 float datatypes, the dataset robustly captures essential aspects of order-related metrics.

Data Completeness

- **Integrity Check:** No missing values, ensuring dataset reliability
- **Precision Enhancement:** Standardizing ratings to numeric values has enhanced the detail and accuracy of customer satisfaction

Key Observartions from Comprehensive Data Overview



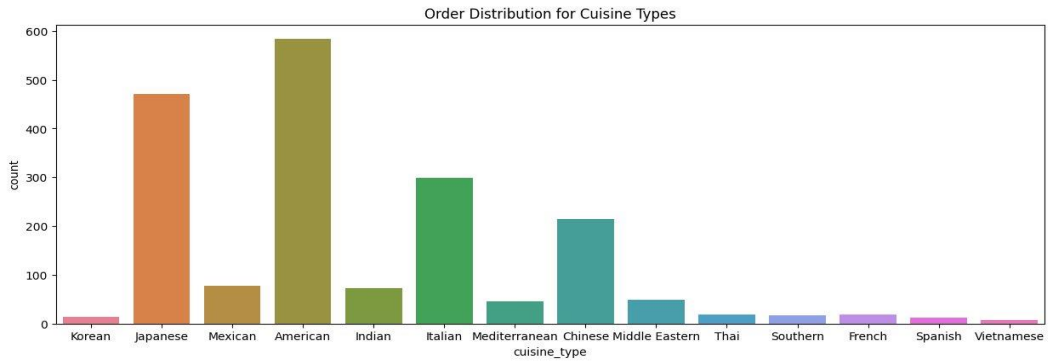
Insights from the Data

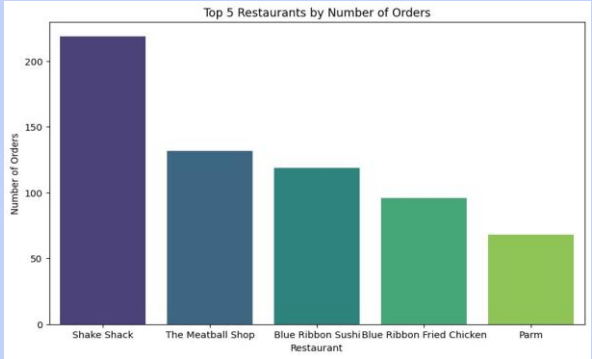
- **Operational Efficacy:** Analysis shows order times range from 20 to 35 mins, with an average prep time of 27.37 mins, indicating efficient food preparation
- **Engagement Opportunities:** Notably, 736 (38%) orders were not rated by customers, indicating a significant opportunity to enhance the feedback collection mechanism
- **Feedback Dynamics**: The decision to retain ratings marked as 'Not Given' facilitates an exploration of underlying patterns if any, in customer feedback, without prematurely dismissing these data points as mere missing data

Key Observations

- Dataset shows diverse preferences and operational strengths
- Data on order costs and customer interactions signal market growth
- Analyzing ratings more effectively could boost service and engagement

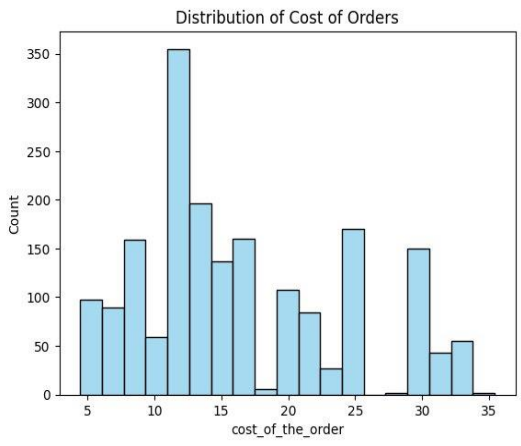
Univariate Analysis and Visualizations of Cuisine Type

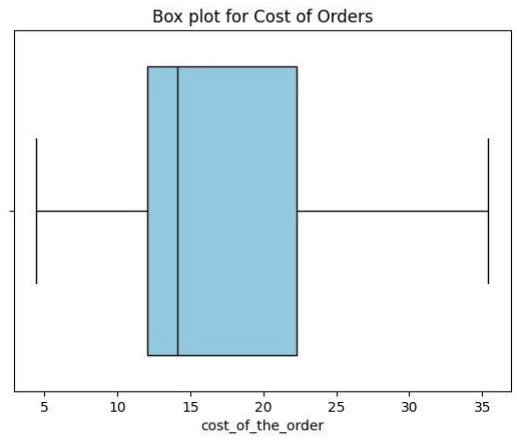




- **Restaurant and Cuisine Diversity:** The platform lists 178 restaurants offering a choice of 14 different cuisines, with American, Japanese, Italian, and Chinese being the most frequently ordered, Vietnamese cuisine shows the least popularity
- **Order Frequency:** Analysis of 1,898 orders reveals strong repeat business, with 416 identified as repeat customers from a total customer base of 1,200. This underscores the platform's ability to retain customers
- **High Performers:** Top 5 performing restaurants are also from the favorite cuisines

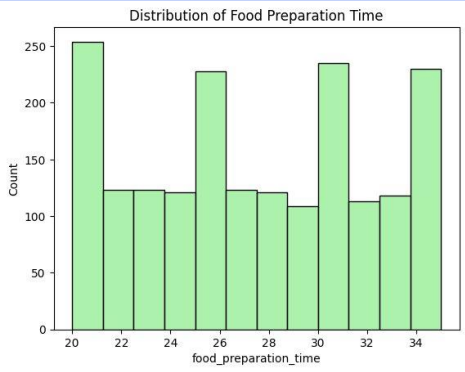
Univariate Analysis and Visualizations of Cost of Orders

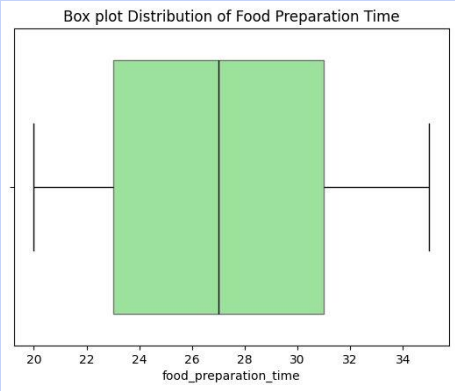




Cost Analysis: Order costs are right-skewed, with the majority falling between $10 to $15, indicating a concentration of moderately priced orders

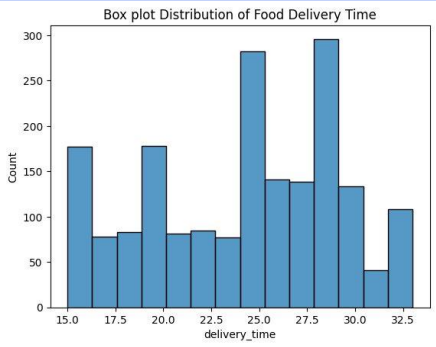
Univariate Analysis and Visualizations of Preparation Time



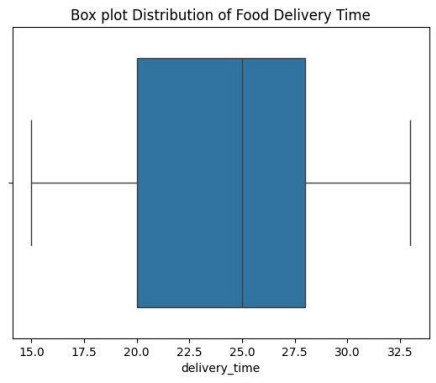


Food Preparation Time Analysis: The preparation time has no apparent skewness and seems to be within a standard range. there are however a few peaks and troughs probably to do with the size of the order

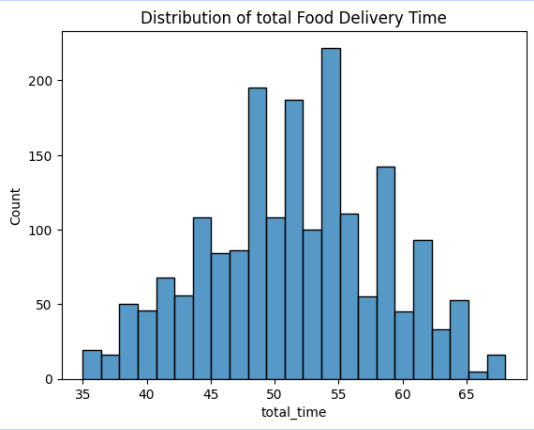
Univariate Analysis and Visualizations of Delivery Time

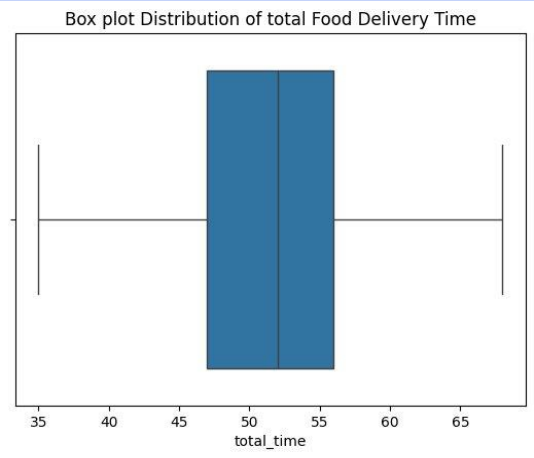


Food Delivery Time Analysis: Histogram and boxplot for delivery times indicate efficiency in operations, with no extreme deviations from the norm



Univariate Analysis and Visualizations of Total Delivery Time



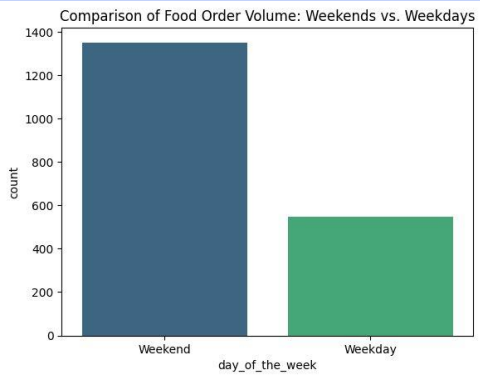


Total Food Delivery Time Analysis:

- **Variability in Times:** Delivery times (15-33 mins) are shorter than total times (35-68 mins), showing preparation adds significantly to wait times
- **Efficiency Indicators:** Average preparation time (approx. 27 mins) plus delivery time (approx. 24 mins) equals an average total time of approx. 51 mins
- **Customer Wait Time:** The median total time of 52 mins is a critical measure for customer satisfaction. **10.54% of orders take more than 60 minutes to get delivered**
- **Opportunities for Improvement:** Identifying steps to reduce preparation and delivery times could enhance customer experience

Total Time = Delivery Time + Food Preparation Time

Univariate Analysis and Visualizations Weekend vs Weekdays



Weekday vs. Weekend Orders:
Weekends experience significantly higher order volumes compared to weekdays, highlighting peak demand times.

Key takeaways from univariate analysis:

1. **Customer Loyalty:** Data suggests a loyal customer base with frequent reorders
2. **Targeted Cuisine Promotion:** There's potential for promoting less popular cuisines to diversify offerings
3. **Peak Time Efficiency:** Operational strategies may need adjustment to handle the increased weekend demand
4. **Feedback Enhancement:** With many orders not rated, a strategy to encourage ratings could provide deeper customer insights

Multivariate Analysis and Visualizations

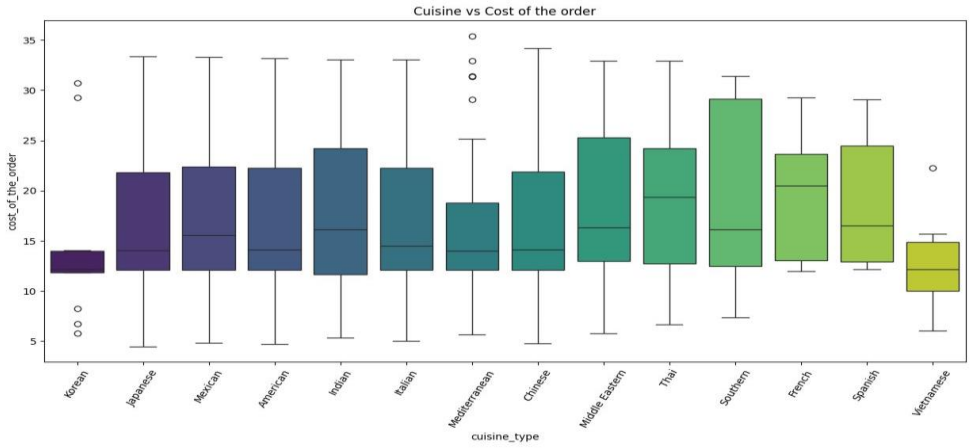
Exploring Inter-Variable Relationships for Strategic Insights

Top Performing Restaurants

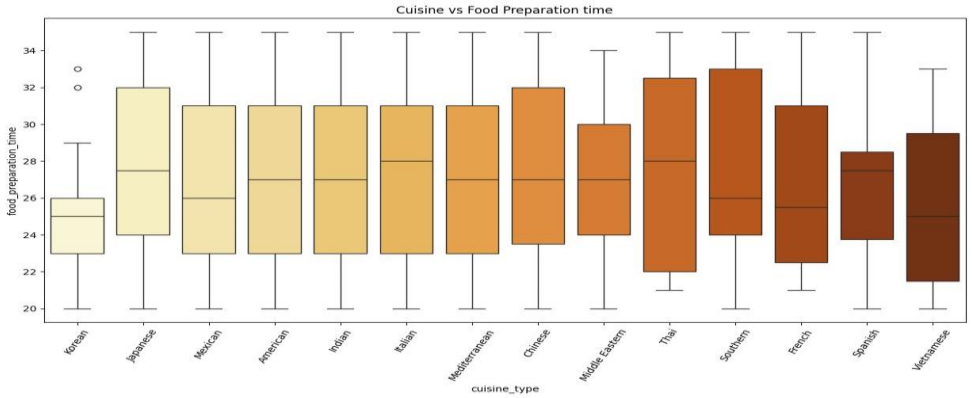
Restaurant Name	Number of Orders	Total Revenue in $
Shake Shack	219	3579.53
The Meatball Shop	132	2145.21
Blue Ribbon Sushi	119	1903.95
Blue Ribbon Fried Chicken	96	1662.29
Parm	68	1112.76

Actionable Insight: Prioritize these high-demand restaurants for promotional activities to leverage their popularity.

Multivariate Analysis of Cuisine



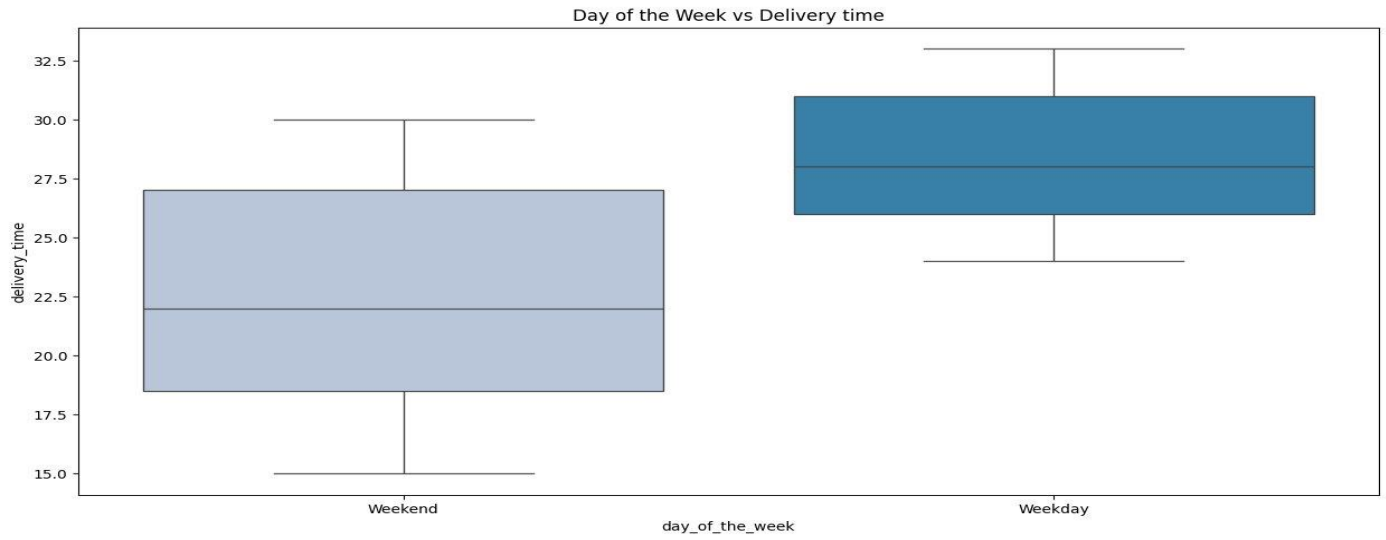
Favorite: American cuisine emerges as the weekend preference with an overall earning of $9530.78 in total of which $6943.67 are on the weekends, potentially driving demand for targeted promotions



Variability in Pricing: Southern cuisine exhibits the highest price range variation, while Korean shows the least

Cuisine Efficiency: Korean and Vietnamese cuisines have lower median preparation times, suggesting quick service capabilities

Multivariate Analysis of Delivery times and Days of the Week



Weekend Variability: Delivery times on weekends show more variability, suggesting potential for optimization

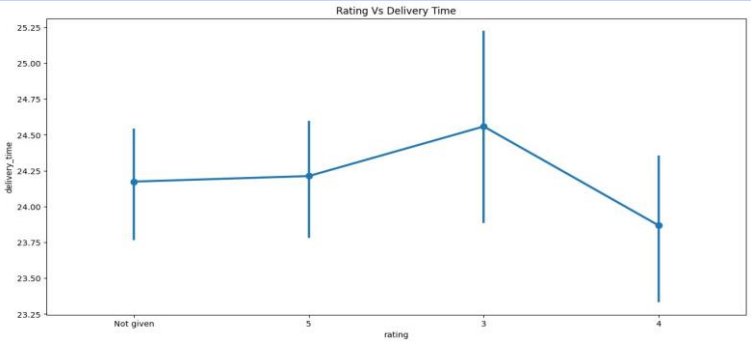
The mean delivery time

weekdays is around 28 minutes

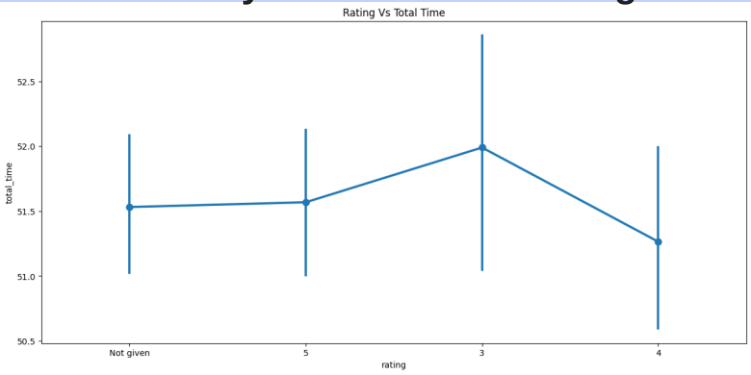
weekends is around 22 minutes

Multivariate Analysis of Delivery Time Vs Rating

Delivery Time Vs Rating

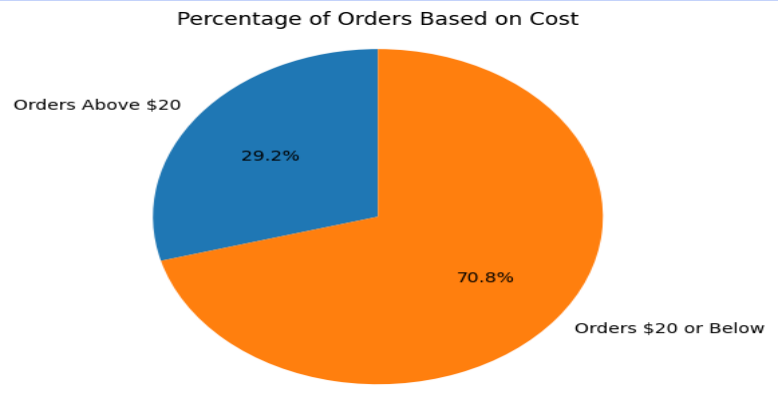


Delivery Total Time Vs Rating



Delivery Time Management:
This shows delivery delays negatively impact customer ratings, with even a minute's delay potentially lowering ratings from 4 to 3, highlighting the critical importance of timely delivery for maintaining high customer satisfaction

Multivariate Analysis of Order Costs and Spending Pattern

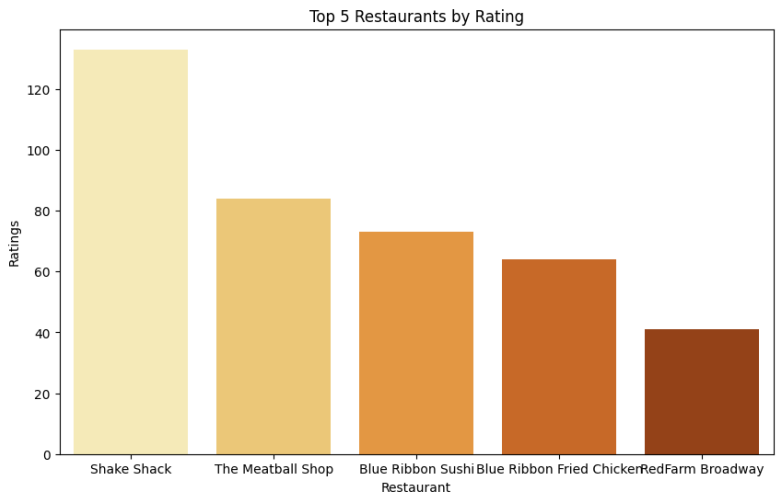


Spending Patterns
Above $20 Benchmark: 29.24% of orders exceed the $20 mark

Customer Id	Frequency
52832	13
47440	10
83287	9
250494	8

Top 3 Frequent Customers:
Customer IDs 52832, 47440, and 83287 have shown exceptional loyalty, qualifying for the 20% discount vouchers

Multivariate Analysis of Rating vs Service



Restaurant Name	Number of Ratings	Ratings
Shake Shack	133	4.5
The Meatball Shop	84	4.3
Blue Ribbon Sushi	73	4.3
Blue Ribbon Fried Chicken	64	4.2

Service Leaders: Top-rated restaurants (4-5 stars) with the most ratings are also the highest earners, (Refer to slide 18) linking service quality to revenue

Multivariate Analysis Observations

Strategic Revenue Opportunities: Understanding the revenue generation across cuisines and restaurants assists in making informed partnership and marketing decisions

Operational Support for High Traffic: High-revenue restaurants may need additional logistical support to maintain customer satisfaction during peak times

Consumer Spending Habits: Differences in spending on various cuisines can inform dynamic pricing strategies and menu diversification

Great Learning

Happy Learning !