Restaurant Data Analysis Report

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Introduction to Restaurant Data Analysis

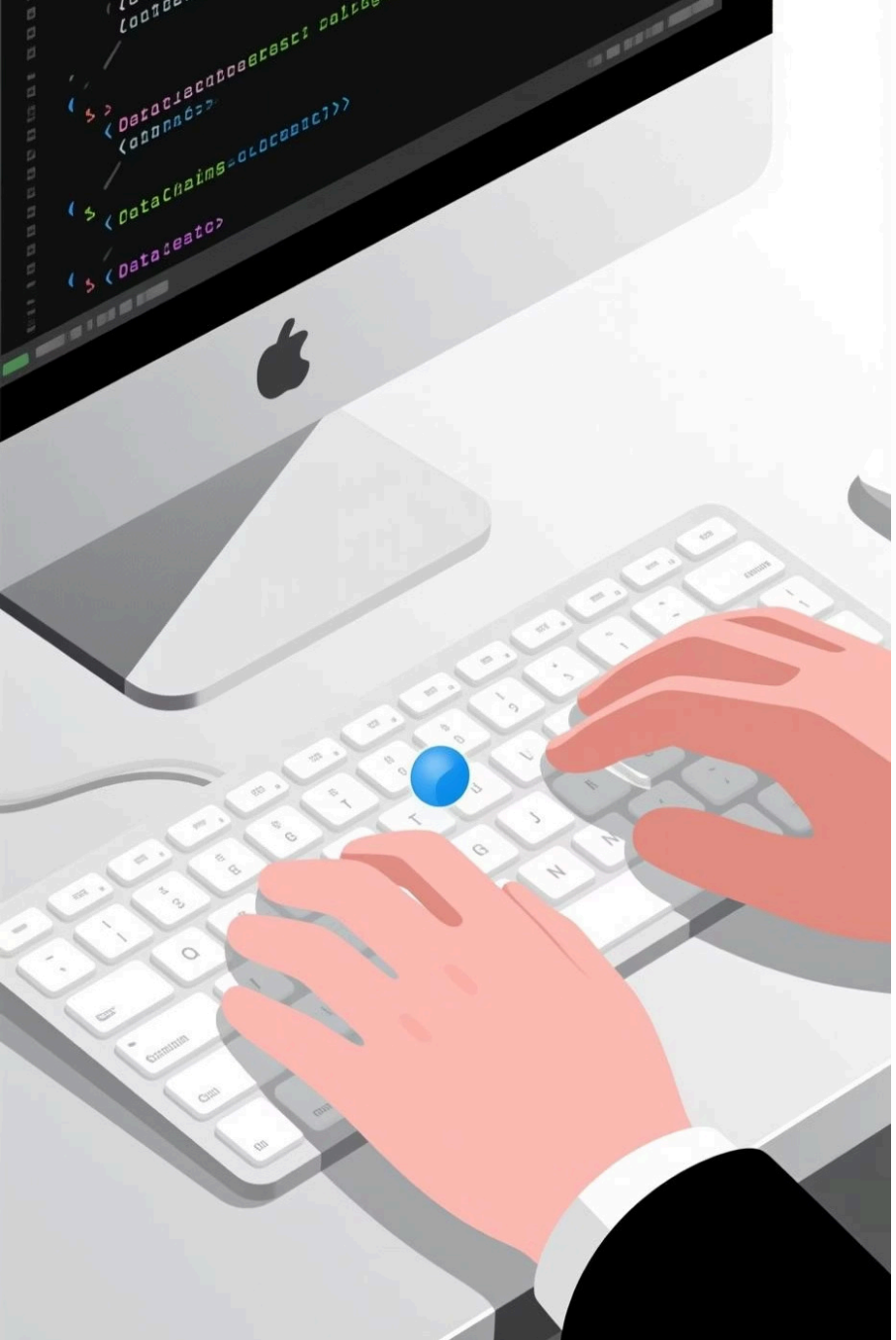
Exploratory Data Analysis (EDA) is crucial for uncovering patterns, anomalies, and relationships in raw data. For restaurant analytics, EDA informs strategic decisions on menu, location, pricing, and service offerings, helping stakeholders understand market trends and customer behavior.

What I Did

- Performed EDA using Python (Pandas) and visualized results with Matplotlib and Folium.
- Created interactive dashboards in Power BI.
- Cleaned and normalized datasets for accurate aggregations.

Why It Matters

A clean dataframe is essential for reliable aggregation, with numeric fields converted and textual flags standardized, ensuring data integrity and preventing misinterpretation.



Dataset Description & Methodology

Understanding data schema and field semantics is vital to prevent misinterpretation. Key fields like IDs, coordinates, ratings, votes, and service flags enable comprehensive cross-sectional and geospatial analysis.

Data Cleaning & Standardization

- Examined columns for missing values and data types.
- Standardized columns (e.g., "Has Online delivery" to Yes/No).
- De-duplicated by Restaurant ID to ensure unique restaurant-level metrics.

Reproducible Pipeline

- Data cleaning: trim strings, drop duplicates, convert numeric columns.
- Transformation: split multi-cuisine cells for per-cuisine analysis.
- Aggregation: groupby operations for counts, averages, and percentages.
- Text analysis: tokenization and stopword removal for keyword extraction.

Cuisine & City Analysis

Analyzing cuisine frequency reveals market preferences, while city concentration highlights market opportunities and regional customer satisfaction.

1

Top Cuisines

Indian (~46%), North Indian (~43%), and Chinese (~30%) dominate the market, indicating strong consumer preference. This data was derived by cleaning and exploding cuisine entries and calculating their percentage coverage.

2

City Restaurant Count

Identifying cities with the highest number of unique restaurants helps pinpoint bustling culinary hubs and potential expansion zones. This analysis reveals market saturation and growth potential.

3

Average City Rating

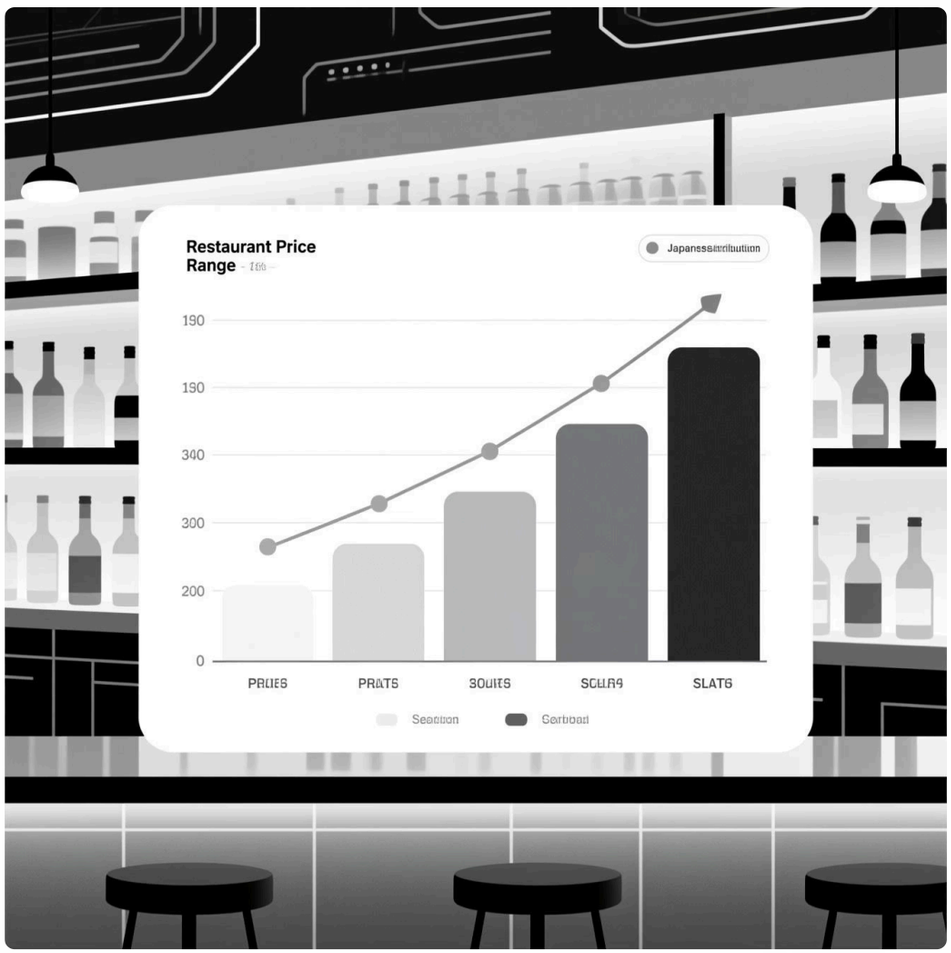
Calculating the mean aggregate rating per city provides insights into regional customer satisfaction, guiding efforts to improve service quality and offerings in specific areas.

Price Range & Online Delivery Insights

Understanding price segmentation helps position products and target specific customer groups, while analyzing online delivery's impact on ratings reveals crucial service correlations.

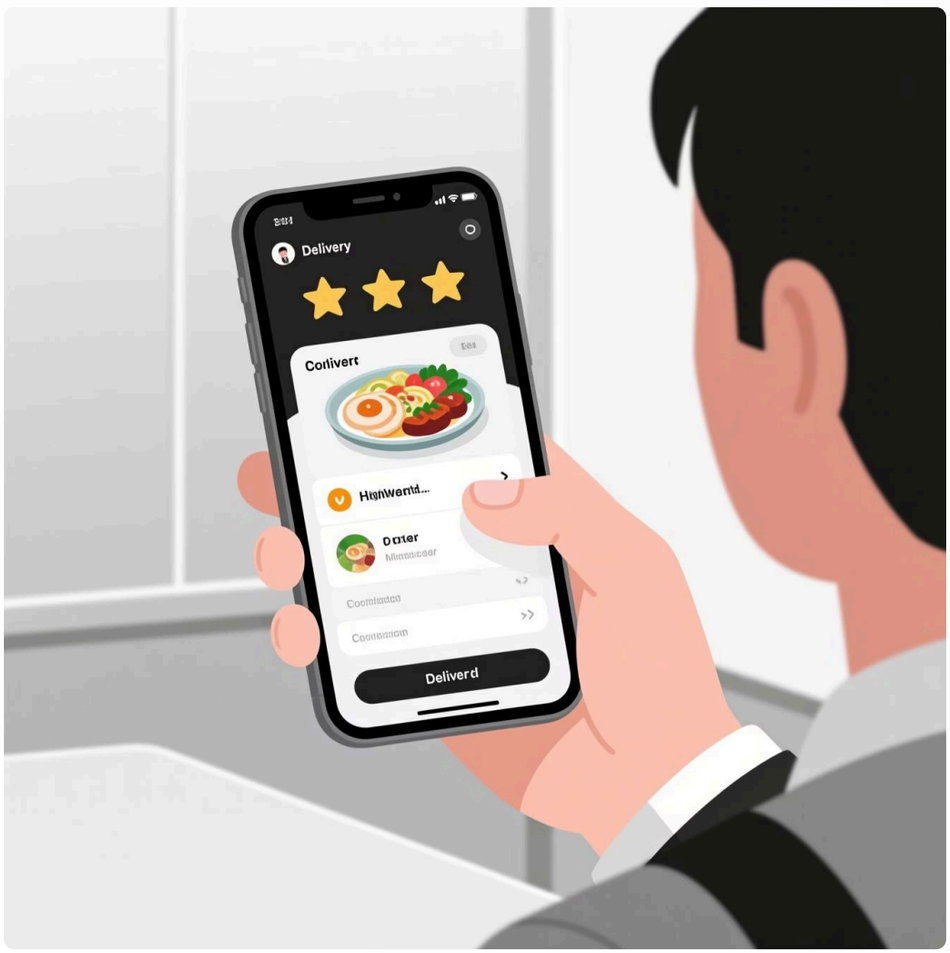
Price Range Distribution

By computing percentages across different price bands (1-4), we can segment the market and understand affordability trends. This helps in product positioning and targeting diverse customer demographics.



Online Delivery vs. Rating

Restaurants offering online delivery consistently show higher average ratings. This suggests that convenience and accessibility significantly influence customer satisfaction and overall perception.



Review Text Analysis

Extracting frequent sentiment words from reviews helps identify restaurant strengths and pain points, offering direct feedback for operational improvements.

Positive Keywords

Words like "good," "tasty," and "excellent" frequently appear in high-rated reviews, highlighting successful aspects of the dining experience.

Negative Keywords

Terms such as "slow," "average," and "poor" indicate areas needing immediate attention, guiding targeted improvements in service or food quality.

Review Length vs. Rating

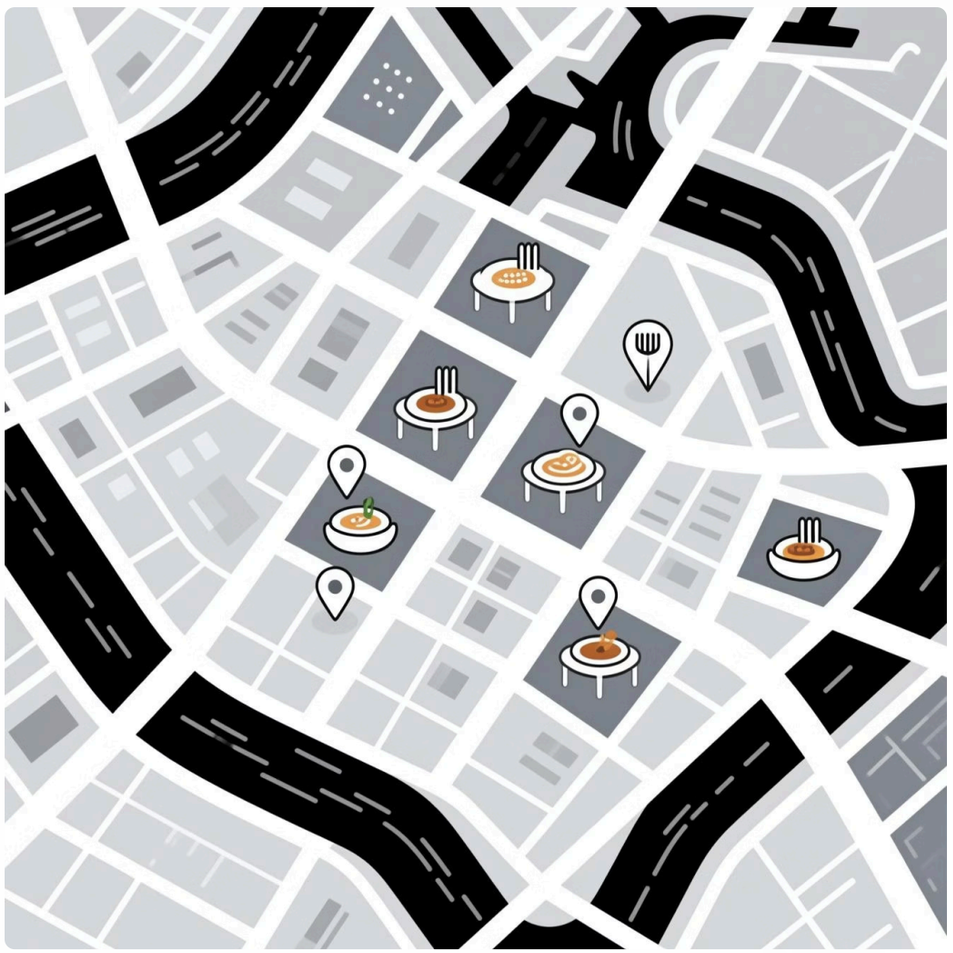
Analysis shows a positive correlation: longer reviews tend to accompany higher ratings, suggesting that satisfied customers are more likely to provide detailed feedback.

Geospatial Mapping & Chain Detection

Mapping restaurant locations reveals density hotspots and catchment areas, crucial for business decisions, while chain detection identifies brand presence and franchise reach.

Geospatial Clusters

Interactive maps with clustered markers show dense restaurant concentrations in major cities. These clusters represent prime locations for new ventures or targeted marketing campaigns.



Restaurant Chain Presence

By identifying restaurant names appearing multiple times, we can map the distribution and reach of various chains, providing insights into brand dominance and market penetration.

Votes, Ratings, and Service Availability

Analyzing customer votes, their correlation with ratings, and the relationship between price range and service availability offers a comprehensive view of restaurant performance and market dynamics.

Highest & Lowest Votes

Restaurants with the highest votes indicate significant popularity and visibility, while those with the lowest votes may require strategies to boost engagement and attract more customers.

Votes vs. Rating Correlation

A positive correlation (e.g., $r \approx 0.4$) suggests that higher-rated restaurants tend to receive more votes, reinforcing the idea that quality drives engagement and popularity.

Price Range vs. Service

Higher-priced restaurants show a greater percentage of online delivery and table booking services. This indicates that service provisioning often correlates with price level and target market expectations.

Key Insights & Recommendations

Combining data-driven analysis with business context generates actionable recommendations for strategy, marketing, and operations.

1

Market Domination

Indian & North Indian cuisines dominate; focus menu strategy accordingly.

2

Urban Expansion

Urban clusters are prime expansion points for new restaurant locations.

3

Service Enhancement

Mid-range restaurants can boost revenue by adding delivery/table booking.

4

Sentiment Leverage

Use positive keywords to highlight strengths and negative keywords for operational improvements.

5

Review Engagement

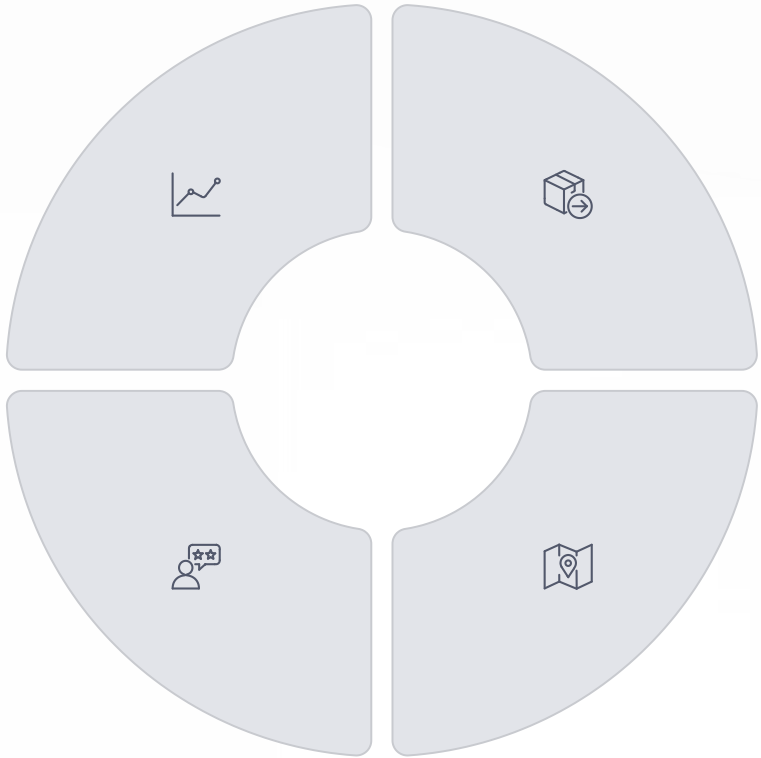
Encourage detailed reviews to increase visibility and build reputation.

Conclusion: Actionable Insights for Growth

This comprehensive analysis provides a clear roadmap for improving restaurant performance and strategic decision-making.

Cuisine & Pricing Trends

Strong trends identified in cuisine popularity, pricing, and customer preferences across cities.



Service Impact

Online delivery and table booking services significantly impact customer satisfaction and ratings.

Sentiment Analysis

Review analysis provided valuable insights into customer experiences, guiding targeted improvements.

Geospatial Clusters

Mapping highlighted major restaurant clusters in metropolitan regions, ideal for expansion.