A Text Analysis of Pizza Express Reviews for Customer Satisfaction Insights

Project Overview

This project analyzes customer feedback for the Pizza Express Islington branch from 2019 to 2024. By applying Natural Language Processing (NLP) and data visualization techniques, the study uncovers key customer insights related to sentiment trends, recurring themes, and overall customer experience. Sentiment classification and keyword extraction methods are used to identify positive and negative trends in reviews, providing actionable insights for operational improvements.

Objective

This project aims to:

- Analyze customer feedback to assess sentiment trends, uncover common themes, and identify areas for improvement.
- Use sentiment analysis (VADER) and unsupervised methods (NLTK tokenization) to extract insights.
- Visualize the results in Power BI, offering actionable insights for improving customer satisfaction.

Methodology

1. Data Collection

Data was collected from Google Reviews for the Pizza Express Islington branch over a period of 5 years (2019–2024). This unstructured data serves as the input for the analysis.

2. Sentiment Analysis

Sentiment analysis was performed using VADER (Valence Aware Dictionary and sentiment Reasoner), which is well-suited for analyzing short, informal texts like customer reviews.

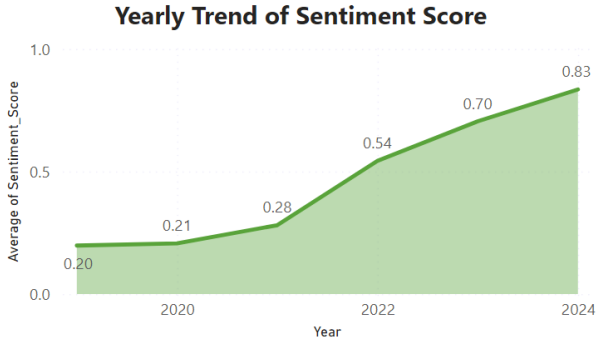
3. Key Phrase Extraction

Key phrases were extracted using NLTK's tokenization and part-of-speech (POS) tagging to identify nouns and adjectives that represent key themes, such as service, food, and atmosphere.

4. Analysis and Visualization

The results were visualized in Power BI, including the following key insights:

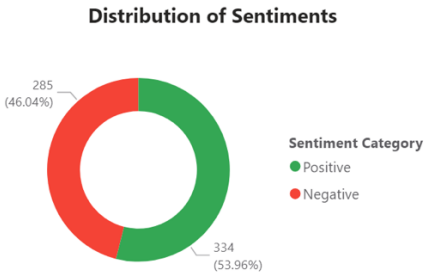
- Yearly Sentiment Trends (Line Chart)



This chart shows sentiment trends over the years

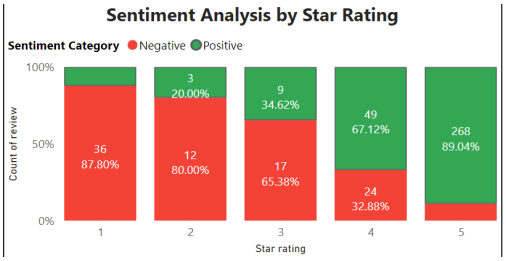
The sentiment scores (2019–2024) show a stable trend, with dips from 2019 to 2021 due to challenges like staff shortages and COVID-19, followed by improvements driven by better service initiatives from 2022 till 2024.

- Sentiment Distribution (Donut Chart)



This donut chart represents the proportion of positive and negative sentiments across all reviews.

- Sentiment by Star Rating (Stacked Column Chart)



This stacked column chart compares sentiment by different star ratings, highlighting correlations. Low star ratings were consistently aligned with negative sentiments, while high star ratings were often linked to positive feedback.

- Key Phrases (Word Cloud)

This word cloud highlights the most frequent phrases and keywords mentioned in the reviews. Positive feedback often highlighted "friendly staff," "great atmosphere," and "good services." Negative feedback frequently mentioned "rude staff" and "poor service."

Technologies Used

- Python: For data analysis and sentiment analysis (VADER, NLTK)
- Power BI: For data visualization and interactive dashboards
- Google Reviews: Data source

Data Preparation

The dataset from Google Reviews had several issues such as blank columns, special characters, and inconsistent date formats. The following steps were taken to clean the data:

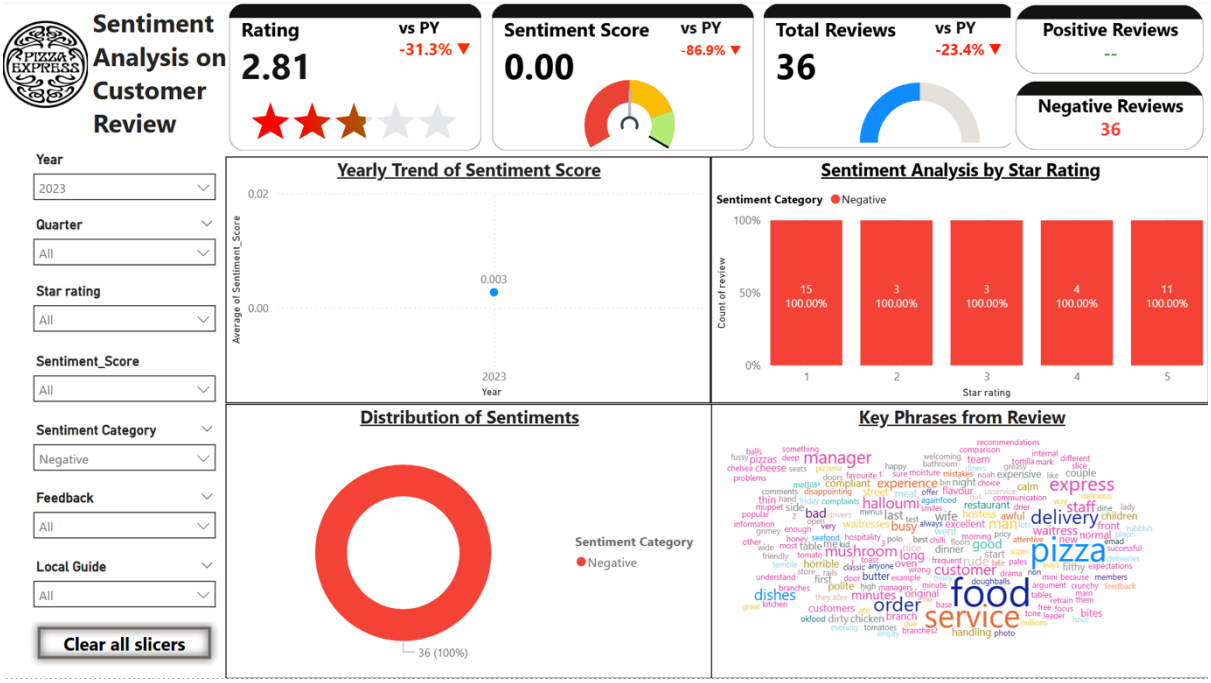
1. Handling Blank Columns: Empty fields in the review content were filled with "No Feedback."

2. Text Cleaning: Special characters and unnecessary symbols were removed from the review text.
3. Date Standardization: Inconsistent date formats were standardized into the MM-DD-YYYY format.

Power BI Dashboard

The project includes an interactive Power BI dashboard that visualizes sentiment trends, sentiment by star rating, and key phrases extracted from customer reviews.

- [Power BI Dashboard Link]



This screenshot gives an overview of the dashboard interface and key visualizations.

Future Work

- Real-Time Analysis: Integrating real-time feedback into the system for up-to-date customer sentiment monitoring.
- Extended Data: Expanding the analysis to other branches for benchmarking.

References

1. Han, et al. (2016), "Text Analytics of Online Customer Reviews: Applying NLP to Improve Customer Satisfaction."
2. Maya Insights (2024), "Building Text Analytics in Power BI with Azure Cognitive Services."