

Sentimental Analysis of Food Recipe Review and User Feedback

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Abstract: Food recipe review and user Feedback research paper is about the sentiment analysis for customer satisfaction. Sentiment analysis is the sentiments, opinions, and emotions expressed in textual data for prediction. This research paper, different machine learning algorithm (logistic regression, Naïve Bayes, SVM) is used to analyze customer satisfaction. With the rapid growth of online recipe websites, there is difficulty to analyze Customer satisfaction feedback about the food recipe.

Basically, it focusses on data preprocessing which convert textual data into numeric data using TF-IDF for numerical value, training and compare the model for accuracy from different type of algorithm to find how to improve high accuracy for the recipe recommendation and to enhance user experience.

Keywords: food review, sentiment analysis, Machine learning algorithm

Introduction:

In recent years, customer gives their feedback about the food recipe on digital platform and there are large numbers of sites are on working. So, difficult to analyze and classify customer satisfaction feedback about the food recipe. Sentiment analysis is about food recipe review from customer emotional identification like positive, negative, neutral.

Before using Machine Learning, analyzing food recipe reviews was done manually, which took a lot of time and effort? It was difficult to handle a large number of user comments, and people often interpreted reviews differently based on their own understanding. This made the analysis less accurate and inconsistent. The traditional methods lacked the ability to handle unstructured textual data such as comments, slang, and mixed sentiments within a single review.

With the help of machine learning algorithm to easily analysis customer satisfaction or review which is in text format.

Different machine learning algorithms are used: Logistic regression, naïve byes, SVM (support vector machine). By comparing these algorithms

SVM has highest accuracy (~79%).

Motivation: In digital platform huge amount of feedback about the food recipe is delivery every day so; we need machine learning techniques for sentiment analysis. The data is in structured or unstructured format. With the help of machine learning techniques it convert the raw data which is in the form of text format into meaningful insights which is in numeric format. The main aim of this research paper is to applying Machine Learning techniques to analyze and classify user sentiments (positive, negative, or neutral) from recipe reviews.

Literature review: Much research has been done on sentimental analysis of food recipe reviews.

In 2023, W. Liao et al. studied Yelp reviews to understand how people feel about different types of food. They found that customer opinions vary with their expectations. The study also shows common topics in reviews, such as taste, price, and service. Overall, it helps in understanding what customers like or dislike about food[1].

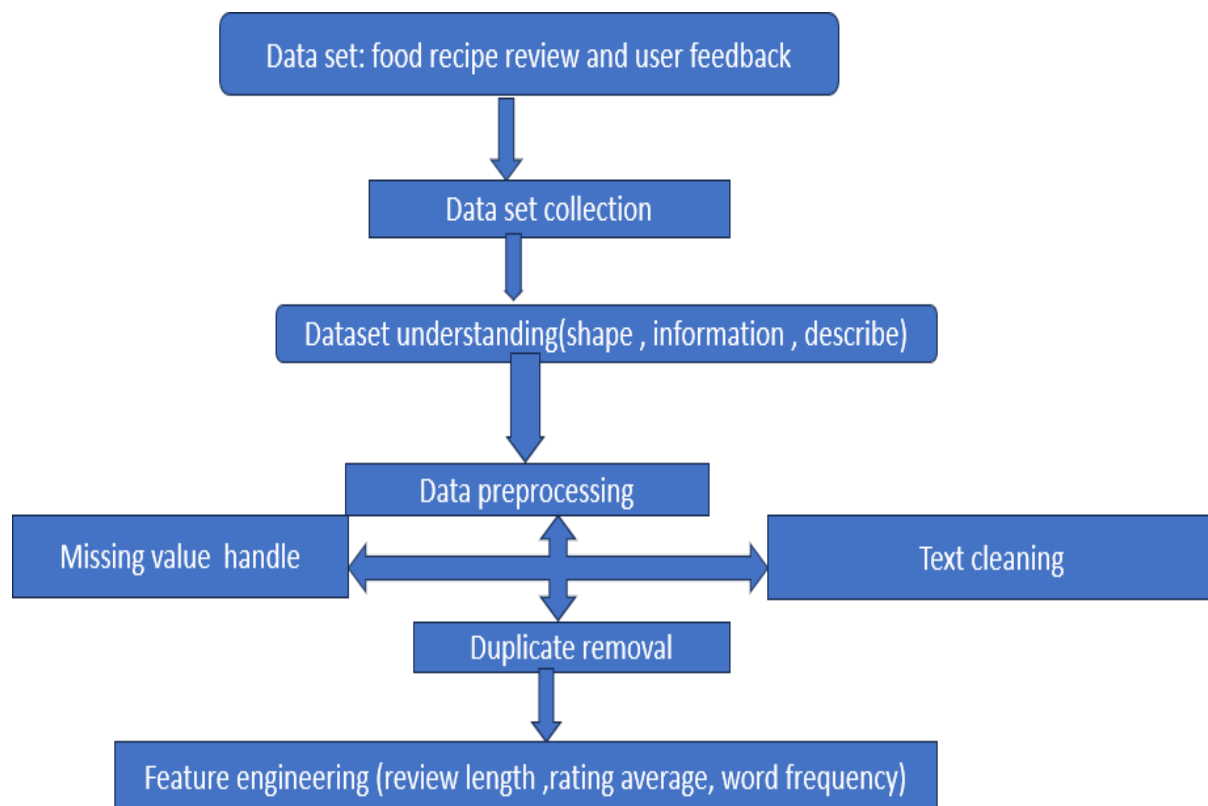
C.-E. Yu and X. Zhang analyzed online reviews to understand people's emotions toward local food. They found that food experiences are closely connected with customers' feelings and cultural expectations. The study highlights that factors like taste, authenticity, and atmosphere strongly influence customer satisfaction. It also highlights positive customer feedback on food quality, showing a non-linear relationship across seasons [2].

M. Vargas-Meza et al. utilized different data science techniques for sentiment analysis, including sentiment prediction, to optimize feature extractions for food recipe review [3].

A. Adak et al. (2022) conducted a review of different studies. They explained how deep learning techniques can accurately identify customer sentiments from reviews. The study also focuses on explainable AI, which helps in understanding how the model makes decisions.[4].

In this paper, P. Pugsee and M. Niyomvanich analyzed user comments on food recipes to understand their opinions and feedback. They applied sentiment analysis techniques to classify comments as positive or negative. The study shows that user reviews can provide useful insights about recipe quality and user satisfaction. [5]

Flow chart:



Methodology:

1. Data collection: Data is collected from kaggle and store it in CSV file path. In the dataset there are 18182 records and 5000 features.

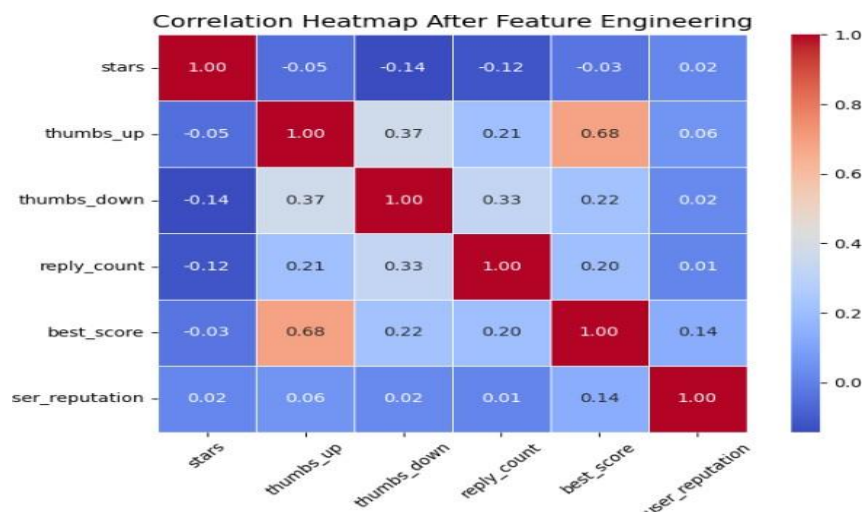
2. Data preprocessing: It is used to remove unnecessary data. There are various steps for data preprocessing:

- Missing value handle
- Text cleaning (punctuation remove, lowercase remove, stopwords remove)
- Duplicate removal

Feature engineering: In this step, important feature is impact on customer sentiment using IF-IDF technique used to convert textual data into numerical data.

Most important feature in the dataset is: -

- stars
- Thumbs_up
- Thumbs_down
- Reply_count
- Best_Score
- user_Reputation
- Text_Length
- Word_count
- Recipe name_length
- User name_length



Result and discussion In this research paper, after compare the training and testing the machine learning algorithm technique. SVM is best because it accuracy is high and suitable for convert

textual data into numeric data using the feature of IT-IDF technique which convert textual data Into the numeric data.

Algorithm	Accuracy	Precision	Recall	F1-score
Logistic regression	78%	79%	96%	89%
Naïve byes	37%	80%	37%	50%
SVM	79%	83%	96%	89%

Conclusion: with the help of machine learning algorithm to analyze the user sentiment review and with the help of data splitting testing and training in the form of 80:20 to prevent from over fitting. Its performance based on Algorithm accuracy, precision, Recall, f1-score to evaluate the model performance the model.Handle complex relationship among these important features. It also helps to improve the performance and prediction reliability.

Future scope:

- With the help of advance deep learning algorithm for the better result.
- To classify user feedback review in the positive or negative. For used large dataset to improve its accuracy and performance.
- With the help of deep learning, it easily classifiesdifferent type of language.

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