Customers Satisfaction Based on Zomato Ratings and Reviews using Machine Learning

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Abstract:- Nowadays most of the people are going out to grab food, the majority of individuals relying on food applications. Though Zomato is popular food app in India, it deals with few challenges like – extreme market competition, loss of market shares, negative impact on brand etc. It experiences a major drop of orders during the month of October, which is a festival season that leads to drop down of revenue. Zomato came up with a solution for this problem, during festival season Zomato provides discounts and coupons on food that they purchase and asked restaurants and food stalls to keep open so that customers can make order even on festival season. The few root cause for Zomato are delivery issues and delay deliveries that can leads to unhappy customers and opt other food apps, more competition from other food apps which provides festival offers and discounts can make the customers to switch other food apps, customers doesn't come forward to purchase when they look high cost on food menu without discounts, and during festival time people more likely to eat outside rather than to order food from food apps. To increase more and more deliveries Zomato should ensure with good quality of food, providing transparency in order-tracking and delivery of meals in time efficiently, and finally to resolve competition over other apps Zomato needs to provide personalized services and make sure the deliveries speed and accurate. Zomato make use of machine learning to predict real time challenges such as allocating delivery partners, estimating time for preparation of food and food delivery, and removing or deducting fake customer reviews. It also uses ML to digitalize the food menu and identifies the items included in that. It includes Natural Language Processing (NLP) to extract the structured data from unstructured data from food menu.

Keywords:- Importing and Cleaning Data, Statistical Methods, Visualization Techniques, Carrying Out Statistical Tests, Model Prediction.

I. INTRODUCTION

Zomato was initially introduced as foodie Bay the in the year 2008 by Deepinder Goyal and Pankaj Chandah. The first stage of Zomato is the service of door delivery to the customer from there belonging restaurant. And later on, it has become a unique company and tied up with the major star restaurants in order to develop their ratings. It becomes more beneficial to the restaurant owners because this raises the more profits. Because each costumer need not come to the restaurant, they can grab their food by using Zomato. It uses the concept of conceptualization in order to create a platform. By this the user can easily categorise the specific restaurant and its menu from the restaurant. Also becomes easy to the customer to give the reviews as their satisfaction. Launching the platform there are many difficulties faced by Zomato such as, understanding the needs and preferences of the customer as well as the competitive land space. Research helped the Zomato to identify the opportunities for differentiation of the growth within the food delivery industry.

Zomato has invested its technology in developing the technologies. The latest technology of it is robust. This provides the user-friendly interface for both the customers and the partners. It helps in implementation of the algorithms more efficiently and ensuring scalability to accommodate for future growth. Zomato mainly focuses on acquiring partnership with the restaurant owners in order to develop the platform with wide variety of dining options. Building up strong relationships with the owners and chefs was essential for ensuring the diverse and high-quality selection of food offerings. It uses the major strategies to campaign their platform to attract the user's attention. This involved leveraging social media advertising, digital advertising, and word-of-mouth referrals to drive user acquisition. Additionally, efforts were made to engage users through features such as reviews, ratings, and personalized recommendations.

People use Zomato platform to search their wished restaurants for their food and ratings are given according to the customer satisfaction. The reviews are also given to the owner based on their service. At present it has occupied more than 1000 Indian cities and became wide spread. This is mainly engaged with 15-35 years of people. It is estimated that it takes more than 10million orders every day. There are few main reasons for succession, they are: advertising, online-table bookings, online ordering and effective delivery of food. Zomato is very successful online food delivery application as it mainly delivers Biryani and Pizza. It is mainly implemented in cities other than villages because people in village people do not know the knowledge of application.

It mainly uses the AI knowledge in order make the customer work easier. Whenever the food is ordered by the customer the delivery boy must know the address of the customer then it uses Google maps based on the AI knowledge. It is mainly based on the sentimental analysis that is according to the customers weather they are familiar

with the seasonal food. At what time what food the customer needs.

We use Natural Language Processing (NLP) to classify reviews of customers. It is the area where computer science and artificial intelligence are concerns with interactions with the human and the machine. It helps in processing large amount of data and to program it.

It uses the branch of Machine Learning which is about analysing any text and handling predictive values. Finally, Zomato faces many circumstances and consequences to become successful. It uses the latest technologies all for the customer's needs and customer satisfaction. It helps in providing employment to the un-employee people. It only chooses the best for the people. It also collects the reviews from the customer after delivering the food.

II. LITERATURE SURVEY

- This article is called "Customer Satisfaction in Online Services" and aims to understand the online shopping experience, including customer sentiment, customers behaviour and trust. The sample size of this study is 200 participants. As technology advances, online grocery services have become a hot topic as they meet the need for convenience. Online food service will reduce labour costs for hotels and restaurants. This helps customers browse and order in just a few clicks. It is also possible to save their favourite orders so they can easily re-order in the future.
- This article collects negative reviews of the 10 partner restaurants that sell the most food, fruit, drinks and snacks on our website, ship online, and raises important issues with online shipping services. Finally, the causes of the problem are determined and suggestions for solving the problem are put forward.

- In today's competition, customer satisfaction is very important. A business cannot imagine its life without satisfied customers. This paper uses logistic regression to develop a customer satisfaction model for online food delivery service. Eight dimensions or variables were considered: better discount, better restaurant selection, better food, packaged food, on-time home delivery, customer service, payment methods, and fees. The research revealed that online food delivery service providers have deficiencies in terms of food packaging, on-time home delivery, customer service and price.
- Nowadays, every family member who is introduced to western culture has access to swiggy, Zomato, food panda etc. He likes to order food from his favourite restaurants through online applications. Usually people pick up the food from the hotel which takes a lot of time to be served. When people go to the market to buy food, the time takes longer and the price increases. This study aims to analyze customer satisfaction with online food ordering using online applications and how it bridges the gap between customers and restaurants. This study aims to examine the factors affecting consumers' food purchasing through food ordering and their satisfaction with these applications. A sample of 45 people was recruited through simple random sampling. Surveys were used to collect important information from participants. SPSS was used to evaluate the feasibility of the research.

III. METHODOLOGY

A. Data Collection:
Zomato dataset has been taken from Kaggle site [https://www.kaggle.com]. Executed Natural Processing Language [NLP] on the dataset. And this code is executed in Google Colab and Jupiter Notebook.

```
zomato = pd.read_csv('updateddta.csv',index_col='Unnamed: 0')
print(zomato.shape)
zomato.head(5)

(5479, 2)
```

	rating	review
0	5	nice
1	5	best biryani , so supportive staff of outlet ,...
2	4	delivery boy was very decent and supportive. 👌 👍
3	1	worst biryani i have tasted in my life, half o...
4	5	all food is good and tasty . will order again ...

Fig. 1: Dataset Import in Jupiter Notebook

Natural Language Processing (NLP) analysis is executed on the above dataset to classify the reviews of customers which are in text format and successfully implemented.

B. Finding Algorithms:

Here we use Random Forest Machine Learning Algorithm.

Random Forest is a popular machine learning algorithm which is used for both classification and regression problems. This algorithm is based on ensemble learning – to improve performance of problem, multiple classifiers are combined together to solve a complex problem. Random forests or random decision forests are an ensemble learning technique for classification. Random Forest is a popular machine learning algorithm that belongs to the supervised learning technique. It can be used for both Classification and Regression problems in ML. It is based on the concept of ensemble learning, which is a process of combining multiple classifiers to solve a complex problem and to improve the performance of the model. As the name suggests, "Random Forest is a classifier that contains a number of decision trees on various subsets of the given dataset and takes the average to improve the predictive accuracy of that dataset." Instead of relying on one decision tree, the random forest takes the prediction from each tree and based on the majority votes of predictions, and it predicts the final output. The greater number of trees in the forest leads to higher accuracy and prevents the problem of over fitting. The below diagram explains the working of the Random Forest algorithm.

Working of Random Forest Algorithm, we can understand the working of Random Forest algorithm with the help of following steps:

- Step 1 – First, start with the selection of random samples from a given dataset.
- Step 2 − Next, this algorithm will construct a decision tree for every sample. Then it will get the prediction result from every decision tree.
- Step 3 − In this step, voting will be performed for every predicted result.
- Step 4 − At last, select the most voted prediction result as the final prediction result.

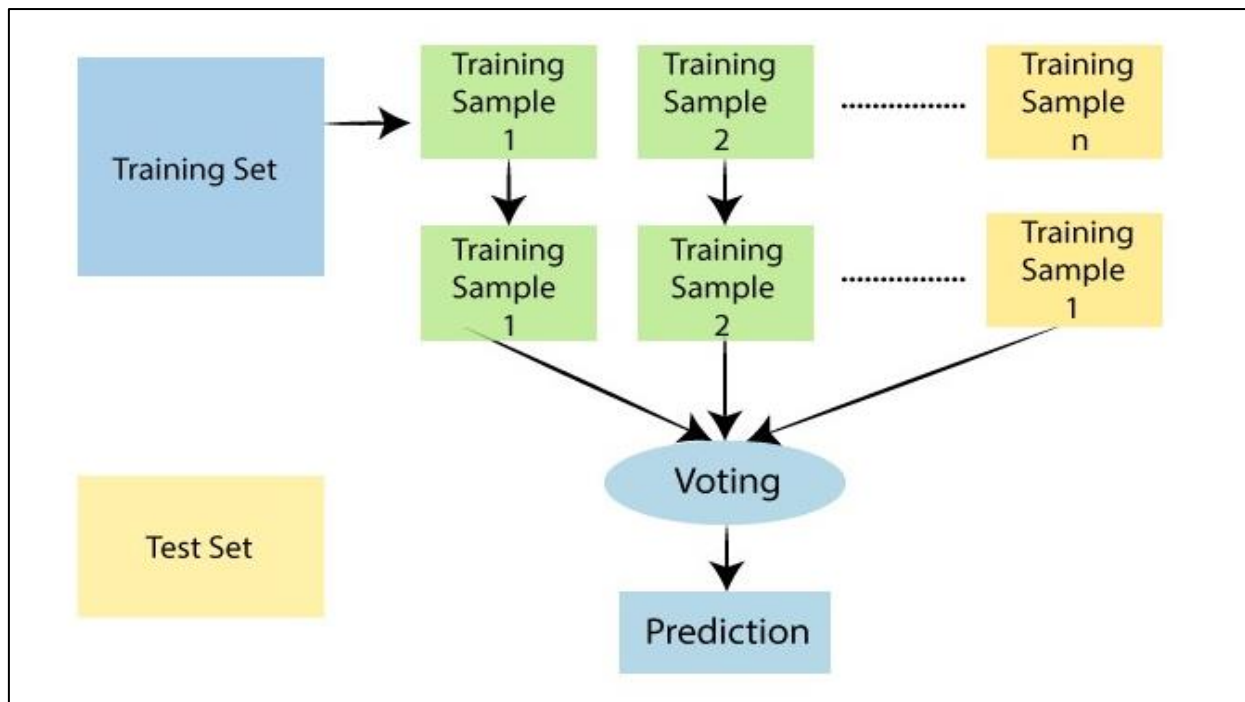This Study aims to create a prediction analysis using machine learning.

Fig. 2: Flowchart of Random Forest Algorithm.

The pseudo code for random forest algorithm can split into two stages. First, in which 'n' random trees are created, this forms the random forest. In the second stage, the outcome for the same test feature from all decision trees is combined. Then the final prediction is derived by assessing the results of each decision tree or just by going with a prediction that appears the most times in the decision trees.

C. Data Pre-Processing:

The given dataset should me pre-processed and this involves handling missing values, encoding categorical variables, scaling numerical features and filtering outliers.

D. Data Modification:

The dataset used here contains ratings and reviews of customers who have purchased food on Zomato platform. The dataset is taken from Kaggle site [https://www.kaggle.com]. Data is executed in Jupiter Notebook.

Fig. 3: Dataset to Perform Random Forest Algorithm

IV. RESULT

A. Code:

```
from sklearn.ensemble import RandomForestClassifier
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score,classification_report
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.feature_extraction import DictVectorizer
from scipy.sparse import hstack
import pandas as pd
data = pd.read_csv("updateddata.csv")
data['Satisfaction']=np.where(condition,"yes","no")
y = data['Satisfaction']
numeric_data = data['Rating']
text_data = data['Reviews']
numeric_df = pd.DataFrame(numeric_data)
vectorizer_text = CountVectorizer()
X_text = vectorizer_text.fit_transform(text_data)
vectorizer_numeric = DictVectorizer(sparse=False)
X_numeric = vectorizer_numeric.fit_transform(numeric_df.to_dict(orient='records'))
combined_features = hstack([X_text, X_numeric])
X_train, X_test, y_train, y_test = train_test_split(combined_features, y, test_size=0.2, random_state=42)
rf_classifier = RandomForestClassifier()
rf_classifier.fit(X_train, y_train)
predictions = rf_classifier.predict(X_test)
accuracy = accuracy_score(y_test, predictions)
print("Accuracy:", accuracy)
classification_report(y_test, predictions)
z=X_test.toarray()
a=z[5].reshape(1,-1)
a
rf_classifier.predict(a)
```

B. Output

Fig. 4: Output

V. CONCLUSION

In the conclusion, the code implements ratings and reviews of Zomato based on the given dataset using Natural Language Processing and Random Forest classifier. NLP classified the text reviews and random forest technique to predict the Customer Satisfaction on Zomato delivery services. It almost gave the accurate output based on given dataset.

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