IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

## IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 6, June 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 6, June 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1106028 |

# Customer Review Evaluation System Using ML

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**ABSTRACT—**The aim of this project is to build a customer review system. This review system will consist of two layers. The first layer is called sentiment analysis where the emotion and opinions from the customer will be determined. In the second layer, the customer review will be analyzed. If the review is positive then it will be well and good but if the review is negative then the reviews will be categorized in different categories automatically(e.g. food quality, environment, services, etc.). hese reviews will then be checked by the store owner/management team and then they will solve the problems for the betterment of the business.

**KEYWORDS-**Review System; Shopping Mall Review; Business Review; Sentiment Analysis; Customer Review;

## I. INTRODUCTION

Within a market economy, any price movement can be defined by a short-term difference between the supply of providers and demands of customers. But sometimes the difference increases with such a high rate that the market falls down. For this reason, customers review is essential to regain the previous profitable business. The customers' growing rate of demand should be balanced to maintain the market economy.

There are multiple problems that need to be solved but in those problems maintenance of the market business should be done on a daily basis.

There are multiple reasons present here to suggest this root-cause first.

The classification of the problems can be categorized as follows:

1.Maintenance of the merchandise.
2.Product management of the market.
3.Product Price Issue.
4.Employee Problem.
5.Product Quality.

The objective of this project is to help the downscale market to get back their economy and sales by customer reviews. Our project has two layers. In the first layer our system uses customer reviews to divide them into negative and positive review by sentiment analysis. Consequently, in the second layer, ignoring the positive reviews our system utilizes the negative reviews to classify them into different categories which are already provided manually in the system.

The customers dataset includes the records of people who visited the market, such as gender, age, customer ID, annual income, spending budget, etc. Our model will use this information to segment the customers into different groups based on their behavior patterns. Such customer segmentation is a highly useful marketing strategy used by brands and marketers to boost sales and revenue while also increasing customer satisfaction.

Our main target is to showcase a framework that can classify reviews automatically without any man power. It helps to grow business with customer fulfilment rapidly.

Our system can measure feedbacks of the customers and analyze those to solve the problems that were leading to the downfall of the business with the help of strong machine learning algorithm. Customers can give their judgement in a secure dashboard. The customer review section has a clean and understandable UI and it is also safe so there will be no risk of data outflow. The business owner can also view these feedbacks from our system and they can take the necessary actions according to the given feedbacks to maintain their economy.

## II. EXPERIMANTAL SETUP

The research was started with analyzing different research papers and review papers on sentiment analysis and some summary was created from each paper by reading and understanding the paper. To prepare an accurate machine learning

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model study was done on frequently used classification algorithms such as Random Forest, Naïve Bayes, k-nearest neighbor, Support Vector Machine, Decision Tree Induction.Some data was collected from 3000 user-created reviews of a local shop via online form of their shop's official website. In those reviews 1000 positive and 1000 negative processed reviews were collected to build a machine learning model. Then this data was properly formatted and converted into csv format. The data was divided into 2 Sub parts for positive and negative data. The converted data was imported into the Google Colab tool using some python dictionary. Then pre-processing of the data csv file was done on Google Colab platform. Google Colaboratory is open source software which allows anybody to write and execute arbitrary python code through the browser, and is especially well suited to machine learning, data analysis and education. The system is a product of Google Research which contains modules for data processing.Google Colaboratory supports various data mining tasks like data preprocessing, binning, clustering, regression and feature selection. To solve the problem of classification we used supervised learning task which consists of assigning a class label to an unclassified tuple in accordance with an existing classified instance set, which is used as a training set for the algorithm.

The 3 classification algorithms that we have used are Naive Bayes and k-nearest neighbors (k = 3) and Random Forest. The percentage of correctly categorized instances will be used as a measure of quality. We have used the 10-fold cross validation for the validation phase. The adopted steps to perform the experiments are as below:

Step 1: Importing the dataset in Google Colaboratory. The first step performed was to import the dataset into the Google Colaboratory. To perform this step a simple import procedure for csv datasets was used.

Step 2: After importing the dataset it is prepared in proper format and divided into two parts for training and testing.

Step 3: After that, using two attributes “Class” and “Text” a relation is created which contains 2000 instances.

Step 4: Then the String ToWordVector filter is applied.

Step 5: Then the AttributeSelection filter is applied.

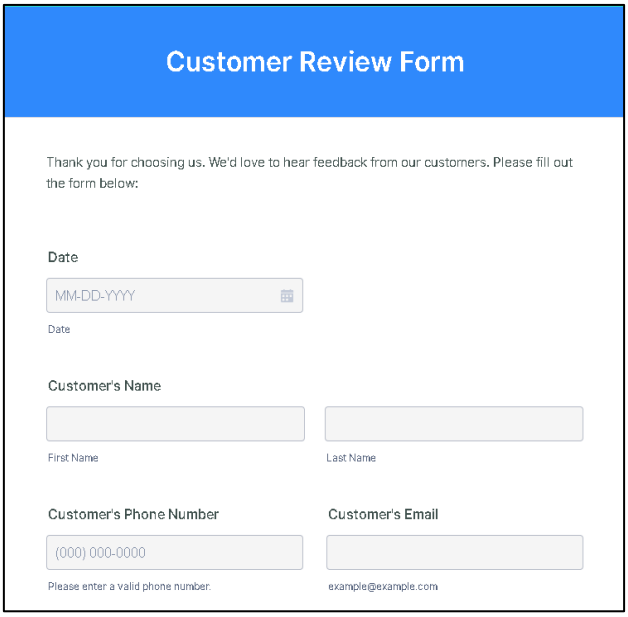
Step 6: After applying the AttributeSelection filter, the results are obtained.

Step 7: After generating data from the above steps three algorithms are performed on it. The three algorithms areK Nearest Neighbor,Random Forest, and Naïve Bayes.

Step 8: After getting the most accurate algorithm we build a model on it.

Step 9: Implemented a web review system or form with this model using python Django language.

*A. Website Preview*




**Section:1**

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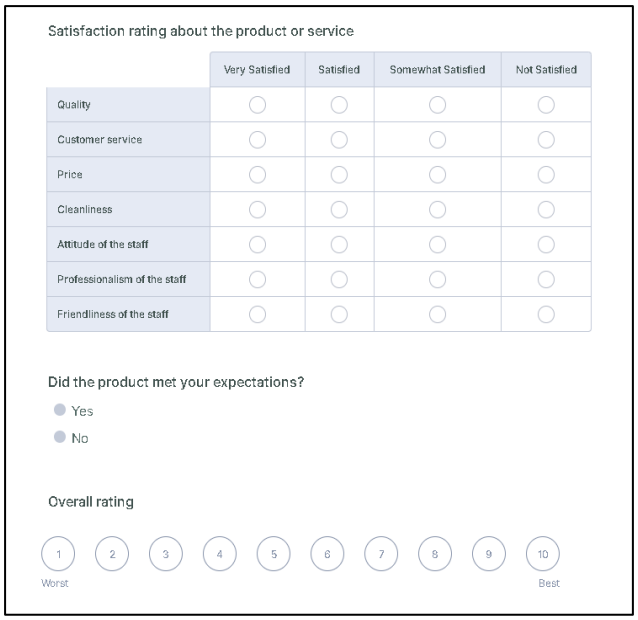
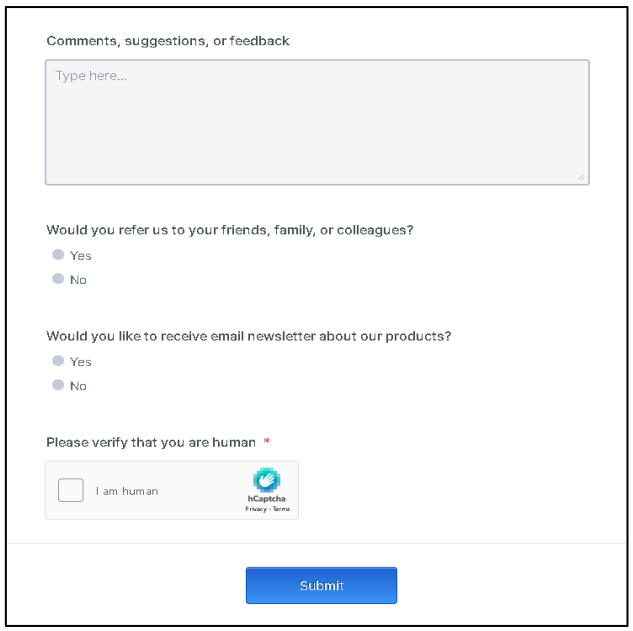



**Section:2**




**Section:3**

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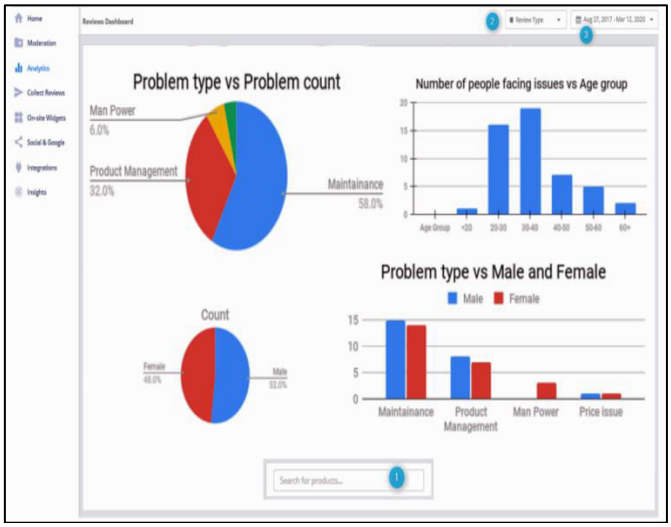
*B. Dashboard Preview*




**Admin Section**

## III. FUTURE SCOPE

The website can be upgraded by adding up treasure management and automated payment pending notification which can help a business to extend its reach to the consumers and for betterment of their own working procedures. This website can help the business to run in an organized manner and also to keep a detailed record.

## IV. CONCLUSION

This work represents a convenient, well designed and a useful website. It has advantageous feature such as the ability to classify reviews automatically without any man power. Sentiment analysis in business can provide a major advancement for the complete brand resurgence. The key to running a successful business with the sentiments data is the ability to exploit the amorphous data for functional insights. The purpose was served by Machine learning models, which largely depend on the manually created features before classification.

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Impact Factor: 8.379

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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