

# Customer Sentiment Analysis

For intel products



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# PROBLEM STATEMENT

- ✚ In today's highly competitive market, businesses rely on customer feedback to improve products, services, and overall customer satisfaction. With the proliferation of social media, online reviews, and customer surveys, companies have access to vast amounts of unstructured data. However, manually analyzing this data to gauge customer sentiment is both time-consuming and prone to error.

## Project Aim

- ✚ The goal of this project is to develop an automated Customer Sentiment Analysis system that can classify customer feedback (reviews, social media posts, etc.) into sentiment categories such as Positive, Neutral, or Negative. By leveraging natural language processing (NLP) techniques and machine learning models, this system will provide businesses with actionable insights into customer attitudes, helping them to:
  - Identify trends in customer satisfaction or dissatisfaction.
  - Understand key drivers behind customer opinions.
  - Make data-driven decisions to improve products and services.
  - Enhance customer experience by quickly addressing concerns highlighted in negative feedback.

# Project Timeline

- I. This project integrates various frameworks like NumPy, Pandas, TensorFlow, and to data analysis, model building, and deployment.
- II. It begins with Data Gathering from Amazon and FlipKart feedback reviews.
- III. Then data cleaning to address missing values, duplicates, and outliers, followed by preprocessing steps such as feature scaling, text cleaning and removing stopwords.
- IV. Exploratory Data Analysis (EDA) with Matplotlib and Seaborn guides modelSelection.
- V. Machine learning models like Logistic Regression, Naïve-Bayes, Decision Trees, and Random Forest evaluated for optimal performance.
- VI. For Enhancing performance and improving the outcome we use NLP techniques with (NLTK or spaCy) to implement models like BERT, VADER and RoBERTa.
- VII. While TensorFlow's GANs generate synthetic data for testing.
- VIII. MLflow manages the entire machine learning lifecycle, ensuring efficient model deployment and scalability.

## Project output example

**Sentiment Analysis App**

text

that's amazing

Clear Submit

output

```
1 {  
2   "roberta_negative": 0.0025723155,  
3   "roberta_neutral": 0.019286618,  
4   "roberta_positive": 0.97814107  
5 }
```

Flag

**Sentiment Analysis App**

text

i dont like it

Clear Submit

output

```
1 {  
2   "roberta_negative": 0.94259065,  
3   "roberta_neutral": 0.05068452,  
4   "roberta_positive": 0.0067248847  
5 }
```

Flag

**Thank you!**