

# Twitter Sentiment Analysis – Project Report

## 1 Introduction

Social media platforms like Twitter have become a hub for users to express their opinions and reactions in real-time. Analyzing these opinions helps us understand public sentiment toward specific topics, events, products, or brands. The Twitter Sentiment Analysis project aims to automatically analyze and classify the sentiment of tweets as positive, negative, or neutral. This analysis supports businesses, political campaigns, and researchers in understanding user feedback and trends.

## 2 Abstract

This project applies Natural Language Processing (NLP) techniques and pre-trained sentiment analysis tools to classify tweets. By integrating the Twitter API, we fetch real-time tweets based on keywords or hashtags, clean and process the data, and then use VADER/TextBlob sentiment tools for classification. The final results are visualized using graphs and dashboards to make insights clear and actionable. This system can be used in marketing, public relations, crisis monitoring, and more.

## 3 Tools Used

- Python – For scripting and data processing
- Tweepy – To connect with the Twitter API
- TextBlob / VADER / NLTK – For sentiment analysis
- Pandas & NumPy – For data handling
- Matplotlib & Seaborn – For data visualization
- Jupyter Notebook – For development and testing
- Streamlit / Dash (optional) – For interactive dashboard deployment

## 4 Steps Involved in Building the Project

### 1. Data Collection:

- Registered and authenticated with the Twitter Developer API
- Extracted tweets using Tweepy based on hashtags or keywords

### 2. Data Preprocessing:

- Removed special characters, URLs, emojis, mentions, and stopwords
- Tokenized and normalized the text (lowercasing, stemming, etc.)

### 3. Sentiment Analysis:

- Used VADER/TextBlob to assign polarity scores to each tweet
- Classified tweets into Positive, Negative, or Neutral based on polarity

### 4. Visualization:

- Plotted sentiment distribution using bar and pie charts
- Created word clouds for frequently used words per sentiment

### 5. Dashboard Creation (Optional):

- Built an interactive UI using Streamlit to enter search terms and view sentiment analytics in real time

## 5 Conclusion

The Twitter Sentiment Analysis project effectively demonstrates how social media can be mined for public sentiment insights. Using Python and NLP tools, we were able to build a real-time system for tweet classification and visualization. The model provides meaningful sentiment insights which can benefit businesses, government agencies, and researchers. Future enhancements can include training a custom machine learning model and expanding to multilingual sentiment analysis.