POLITICAL SENTIMENT ANALYSIS ON TWEET

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ABSTRACT

In this study, a complete NLP-based sentiment analysis tool specifically designed for handling political tweets is merged with the sentiment analysis VADER approach. In addition to the standard sentiment analysis functionalities, the solution includes a web application interface with modules dedicated to users and administrators. Users can register and use the interface to perform real-time sentiment analysis on political tweets, providing valuable insights into popular opinion on political issues, figures, and events. Thanks to the administrator module, administrators may monitor registered users' activity and manage user registrations in the interim. This study aims to provide political stakeholders with accurate and timely insights into the dynamics of public sentiment within the political arena by combining advanced natural language processing (NLP) techniques with an easy-to-use web application interface. This will allow political stakeholders to communicate their ideas and make well-informed decisions in real time.

1. INTRODUCTION

Since social media became widely available, public debate and opinion formation have taken place on major platforms like Twitter, completely changing the way political discourse is done. These platforms are useful tools for assessing public opinion on political issues, figures, and events because of the quick information flow and range of viewpoints they offer. But the sheer amount and speed of data pose serious obstacles to human interpretation, requiring the creation of automated methods to reliably and effectively gauge public opinion.

This study describes a comprehensive natural language processing (NLP) tool designed exclusively for processing political tweets. The tool makes use of the VADER (Valence Aware Dictionary and Sentiment Reasoner) technique for sentiment analysis. Thanks to its reliance on a human-curated lexicon, its ability to handle slang, emoticons, and other social media-specific language quirks, and its versatility, VADER is well-known for its

efficacy in assessing attitudes expressed in social media environments.

The web application interface of the tool we built includes user and administrator- specific modules. In order to do sentiment analysis on political tweets in real time and obtain important insights into the opinions and responses of the general public, users can create accounts. Political stakeholders, in particular, need to be able to stay up to date on changes in public opinion in order to make strategic decisions and effectively communicate.

In order to maintain the platform's security and usability, the administrator module also offers strong functions for controlling user registrations and keeping an eye on user activity. By combining cutting-edge natural language processing methods with an intuitive online interface, political stakeholders will be empowered to gain accurate and timely insights into the intricate dynamics of public opinion.

The present study provides an overview of the tool's conception and execution, its foundational approaches, and its possible political uses. The instrument improves stakeholders' capacity to interact with the public, adjust to changing opinions, and maneuver politically by providing a dependable and effective method of sentiment analysis.

2. RELATED WORK

The goal of sentiment analysis of political tweets from the 2019 Spanish elections is to determine how the general public feels about various parties, candidates, and issues. It aids in determining voter concerns, evaluating the success of campaigns, and forecasting election patterns. Parties can hone tactics to better connect with voters and modify messaging by tracking changes in opinion over time. All in all, it provides insightful information on public opinion during a significant political event. [1] "Sentiment analysis on Twitter using soft computing techniques" is the title of a systematic literature review that aims to investigate and compile the methodologies and conclusions of previous studies in this particular field. Its goal is to evaluate the efficacy of machine learning and other soft computing techniques in sentiment analysis on Twitter. In addition to providing insights to direct future research and breakthroughs in sentiment analysis approaches for social media platforms like Twitter, the review will highlight trends, obstacles, and advancements in the industry.[2]

Our study's primary goal is to use machine learning classifiers and natural language processing (NLP) to analyze the sentiments posted on Twitter. In order to accurately comprehend public opinion, we try to classify tweets as either good, negative, or neutral. We want to determine the best method for sentiment analysis on social media by comparing many machine learning classifiers with a dynamic dataset, offering important insights into how tweets

affect public opinion. [3] This paper's primary goal is to review deep learning algorithms that are applied to sentiment analysis. It analyzes datasets and their characteristics, highlights well-known deep learning architectures, and emphasizes significant research achievements. The purpose of the survey is to show how useful deep learning is for tasks involving sentiment analysis. All in all, it demonstrates the effectiveness of deep learning in sentiment analysis.[4]

This survey paper's primary goal is to present a summary of current studies on political subjects on Twitter. It looks at opinion surveys and political discourse sentiment analysis, as well as Twitter's function as a social network and news source. The study also examines computational social science methods for social interaction, influence, and behavior analysis on Twitter.[5]

The main objective of this paper is to develop automatic methods for assessing the credibility of trending topic tweets on Twitter. By analyzing user behavior, post content, and external citations, the study classifies tweets as credible or not credible. The methods show 70%-80% accuracy based on human evaluations.[6]

This paper's primary goal is to examine tweets regarding a political figure in order to comprehend the attitudes of voters both before and after elections. This entails locating and compiling viewpoints, feelings, and attitudes shared on social media. The study intends to offer insights into the public's view and the political leader's social image by keeping an eye on these actions.[7]

This paper's main goal is to gather and examine Twitter data regarding Donald Trump using RapidMiner and the AYLIEN extension. The study intends to obtain insights into the public's overall thoughts and reactions to his acts as the current US president by utilizing sentiment analysis. This method uses the vast amount of personal information that is readily available on social networks to do focused analysis.[8]

This study's primary goal is to use different machine learning (ML) classifiers in conjunction with natural language processing (NLP) to do sentiment analysis on tweets. The work attempts to compare the performance of various ML classifiers on a dynamic dataset by classifying attitudes as good, negative, or neutral, offering fresh perspectives on the significance of social media expressions.[9]

This survey's primary goal is to examine and contrast the methods currently in use for sentiment analysis of Twitter data. It assesses techniques including Naive Bayes, Max Entropy, and Support Vector Machine with an emphasis on machine learning and lexicon-based methodologies. The survey addresses the basic difficulties and uses of sentiment analysis on Twitter, as well as how various methods manage the unstructured and varied character of tweets.[10]

3. METHODOLOGY

The process of creating an all-inclusive natural language processing (NLP) tool for political tweet sentiment analysis includes multiple crucial phases, including gathering data, preprocessing, sentiment analysis, and designing an intuitive online application. We describe the methods used at each project step below.
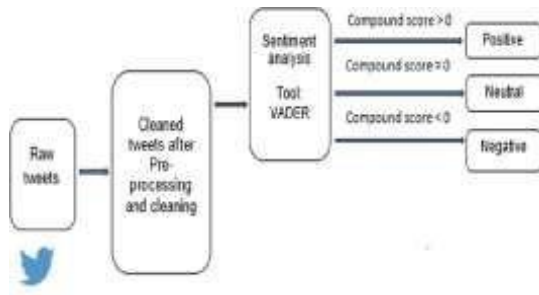
Figure1: Architecture Diagram

3.1 Gathering and analyzing requirements:

Acknowledge the objectives and requirements of the stakeholders. Indicate the features, purposes, and target audience for the project. Look at the political tweets that are used as the data sources to see what knowledge of sentiment analysis is required.

3.2 Design:

Design the architecture of the sentiment analysis tool, taking into account the data flow, modules, and other elements. Consider usability and user experience when designing the web application's user interface. Make the database structure required for data storage.

3.3 Selection of Technology:

Choose appropriate frameworks and technologies to implement the sentiment analysis tool and web application. For text processing and sentiment analysis, use NLP tools and libraries (such as the VADER sentiment analysis tool). Choose the front-end and back-end technologies for the web application.

3.4 Development:

Build the sentiment analysis functionality with the selected NLP tools and frameworks. Configure user authentication and role-based access control for the web application. Make separate web application interface modules for the admin and users. Incorporate tools for real-time data processing and analysis for the analysis of political tweets.

3.5 Testing:

To ensure that the components that are generated are accurate and dependable, run integration and unit tests. To ensure that the application meets the needs and expectations of the stakeholders, do user acceptability testing, or UAT. Analyze the scalability and performance of the application, taking note of the real-time tweet analysis.

3.6 ALGORITHM USED

1. Naive Bayes

Based on Bayes' theorem, the naive bayes classifier is a probabilistic algorithm that generates predictions by estimating the likelihood of each sentiment class (positive, negative, or neutral) given a given text. The independence between features is one of the fundamental presumptions of Naive Bayes, which holds that the existence of one feature in the text is independent of the existence of other features. Naive Bayes is nevertheless capable of performing well in text classification tasks such as sentiment analysis, even with this oversimplified assumption. Naive Bayes is capable of effectively predicting the sentiment of text data by calculating the probabilities of various sentiment classes and choosing the class with the highest likelihood. In sentiment analysis applications where feature independence can be fairly presumed, Naive Bayes is a common choice due to its ease of implementation, adaptability for high-dimensional text input, and computational economy.

2. Support Vector Machines (SVM):

In sentiment analysis, Support Vector

Machines (SVM) are a clever technique that help distinguish distinct sentiment categories in text data. SVM can quickly determine if a passage of text is favorable, negative, or neutral by drawing this line. It works well with large text volumes and,

with the help of specific algorithms known as kernel functions, can even comprehend intricate links between words and emotions. SVM is a popular option for interpreting sentiments in text data since it may be likened to a superhero for deducing emotions from people's words.

4. RESULT

This section is essential since it presents the conclusions drawn from examining the sentiment of political tweets and aids in comprehending trends in sentiment, public opinion, and any repercussions for political figures or parties.

Accuracy:

The percentage of correctly identified cases relative to the total number of instances is commonly used to determine the accuracy of a sentiment analysis model. In order to determine a sentiment analysis model's accuracy for political tweets, Calculate the accuracy of the sentiment analysis model using the following formula:

$$\text{Accuracy} = \frac{\text{Number of Correct Predictions}}{\text{Total Number of Predictions}} \times 100$$

For example, the accuracy would be if your sentiment analysis model accurately predicted the sentiment of 80 out of 100 political tweets in the test dataset.

$$\frac{80}{100} \times 100 = 80\%$$

Tables:

Polarity score	Modi	Modi After Foreign visits
Positive	21	27
Negative	-19	-2
Neutral	14	12

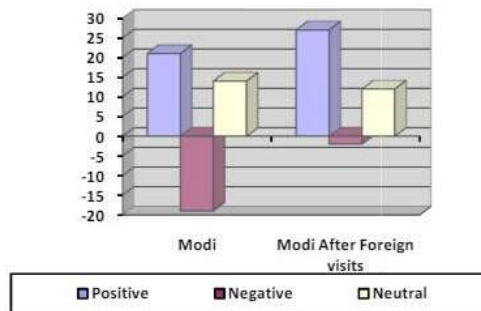TABLE 1: Polarity score of tweets PM Narendra Modi

Figure2: Polarity score of tweets PM Narendra Modi

5. CONCLUSION

This work has successfully combined the VADER technique with a complete NLP-based sentiment analysis tool designed for political tweets. Along with typical sentiment analysis, the solution has an easy- to-use web application interface with separate modules for administrators and users. Users can create profiles and use the interface to analyze political tweets in real- time for sentiment, providing insightful information about what the public thinks about political issues, personalities, and

events. In the meantime, efficient user registration management and activity tracking are made possible by the administrator module. The primary goal of this research is to provide political stakeholders with accurate and timely insights on the dynamics of popular mood in the political arena. Through the use of sophisticated natural language processing and a user-friendly web application interface, the tool supports well-informed decision-making and improves communication tactics instantly. This project demonstrates how NLP can improve comprehension and impact public conversation while offering a strong foundation for political participation and tactic modification.

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