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# SENTEX- The Modern Sentiment Analysis

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**ABSTRACT:** Sentiment analysis or opinion mining is the computational study of people's opinions, sentiments, attitudes, and emotions expressed in written language. We remove any unwanted information from the text, such as stop words, punctuation, and special characters. We also perform text normalization, such as stemming or lemmatization, to reduce the words to their base forms. We identify the features or attributes that are relevant to the sentiment analysis. This can be done using various techniques, such as bag of words, n-grams, or word embeddings. We classify the sentiment of the text as positive, negative or neutral. This can be done using various machine learning algorithms, such as Naive Bayes, Support Vector Machines (SVM), or neural networks. We evaluate the performance of the model using various metrics, such as accuracy, precision, recall, and F1 score..

**KEYWORDS:** Bag of words, n-grams, or word embeddings ,Naive Bayes, Support Vector Machines (SVM), or neural networks.

## I.INTRODUCTION

Sentiment analysis is a powerful tool in the field of natural language processing (NLP) that allows us to analyse and classify the emotions, attitudes, and opinions expressed in textual data. It has become increasingly important in recent years as more and more data is generated through social media, customer feedback platforms, and other sources.

The aim of sentiment analysis is to determine whether a piece of text is positive, negative, or neutral in nature, and to identify the underlying emotions and opinions behind the text. This information can be used for a variety of purposes, such as identifying customer satisfaction levels, tracking public opinion on a particular topic, or monitoring brand reputation. Sentiment analysis involves several steps, including data collection, text preprocessing, feature extraction, and machine learning modeling. One of the biggest challenges in sentiment analysis is accurately interpreting the nuances of human language, such as sarcasm, irony, and other forms of figurative language. Despite these challenges, sentiment analysis has a wide range of applications in many fields, including marketing, customer service, politics, and more. As technology continues to advance, sentiment analysis is becoming increasingly sophisticated and accurate, opening up new possibilities for its use.

## II . RELATED WORK

"Opinion mining and sentiment analysis" is a seminal paper published in 2008 by Bing Liu and Lillian Lee, in which they provide a comprehensive survey of the field of sentiment analysis. The paper covers the history of sentiment analysis, its challenges and limitations, the techniques and algorithms used in sentiment analysis, and its applications in various fields, such as marketing, politics, and customer service. It is considered a foundational work in the field of sentiment analysis and has been widely cited in subsequent research. The accuracy of the existing system is about 70% .

"A Deep Learning Approach to Sentiment Analysis in Twitter" by Tasnim Mohiuddin and Md. Ashraf Islam (2019) - This paper proposes a deep learning approach for sentiment analysis on Twitter data using Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) has an accuracy of 89.9% on the SemEval-2017 Task 4 dataset, which is a benchmark dataset for sentiment analysis on Twitter. They also report a comparative analysis with other state-of-the-art approaches, showing that their proposed approach outperforms them in terms of accuracy..

We have provided a solution with more accuracy than the existing system does not have a faster way of getting insight from customer data .The ability to act on customer suggestions.The accuracy and insightful of customer perceptions and feedback is low . The work in this paper is divided into two stages. 1) Tokenization 2)Sentence Splitter 3) SentiWordInterpretation.Based on the sentiment analysis technique used, the text is classified into a positive, negative, or neutral sentiment. Some techniques may also assign a sentiment score to each text, indicating the intensity of the



sentiment. Visualization tools such as word clouds, sentiment histograms, and sentiment heat maps can be used to present the results in an easily interpretable format .

### III. METHODOLOGY

There are 5 steps to analyze sentiment data and here’s the graphical representation of the methodology to do the same.



**Data Collection** :Consumers usually express their sentiments on public forums like the blogs, discussion boards, product reviews as well as on their private logs – Social network sites like Facebook and Twitter. Opinions and feelings are expressed in different way, with different vocabulary, context of writing, usage of short forms and slang, making the data huge and disorganized

**Text Preparation** :Text preparation is nothing but filtering the extracted data before analysis. It includes identifying and eliminating non-textual content and content that is irrelevant to the area of study from the data.

**Sentiment Detection** :At this stage, each sentence of the review and opinion is examined for subjectivity. Sentences with subjective expressions are retained and that which conveys objective expressions are discarded. Sentiment analysis is done at different levels using common computational techniques like Unigrams, lemmas, negation and so on.

**Sentiment Classification** :Sentiments can be broadly classified into two groups, positive and negative. At this stage of sentiment analysis methodology, each subjective sentence detected is classified into groups-positive, negative, good, bad, like, dislike.

**Presentation of Output** :The main idea of sentiment analysis is to convert unstructured text into meaningful information. After the completion of analysis, the text results are displayed on graphs like pie chart, bar chart and line graphs.

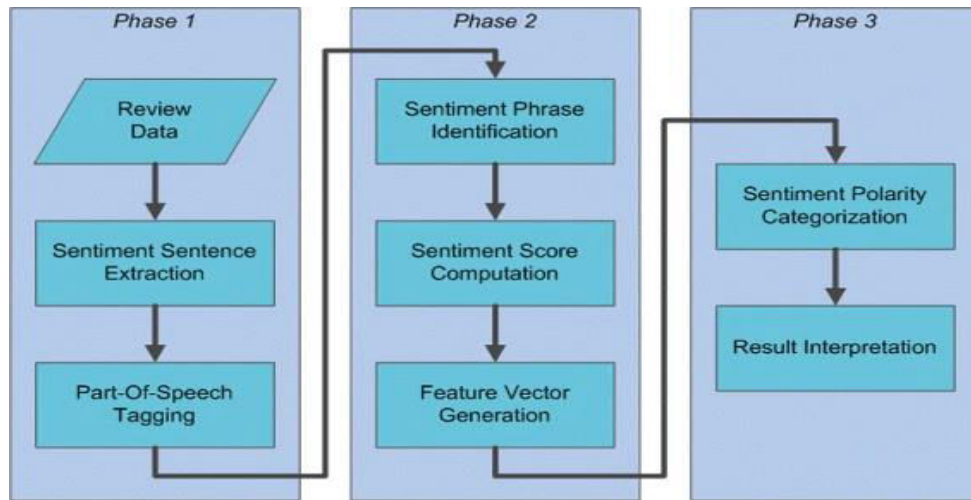
### IV.EXPERIMENTAL RESULTS

Word	Sentiment
wait	negative
rude	negative
helpful	positive
friendly	positive
...	...



- “The customer support was very **helpful**, but I **waited** on the phone for a **long time**.” - **negative**
- “The **waiting time** was so **long** that I just **gave up**.” – **highly negative**

Star Level	General Meaning
★	I hate it.
★★	I don't like it.
★★★	It's okay.
★★★★	I like it.
★★★★★	I love it.



**Example :**

User's Opinions:

Sameer: It's a great movie (Positive statement)

Neha: Nah!! I didn't like it at all (Negative statement)

Mayur: The new iOS7 is awesome..!!!(Positive statement)

**GETTING THE PREDICTIONS :**

```

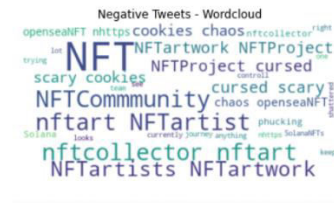
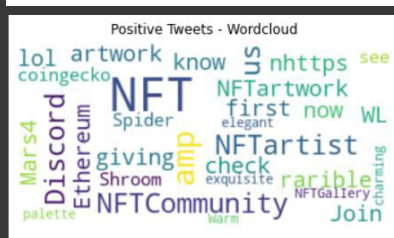
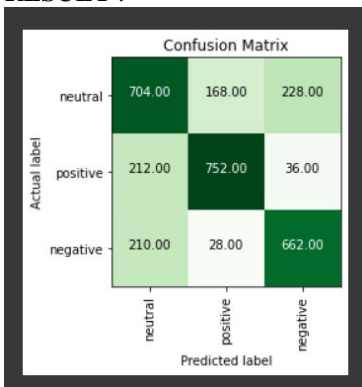
predictor = ktrain.get_predictor(learner.model, preproc=t)
predictions = []
for i in all_test_tweets:
    predictions.append(predictor.predict(i.content))
actual_num = []
for i in all_test_tweets:
    if i.sentiment == "neutral":
        actual_num.append(0)
    elif i.sentiment == "positive":
        actual_num.append(1)
    elif i.sentiment == "negative":
        actual_num.append(2)
predictions_num = []
for i in predictions:
    if i == "neutral":
        predictions_num.append(0)
    elif i == "positive":
        predictions_num.append(1)
    elif i == "negative":
        predictions_num.append(2)
show_results(actual_num, predictions_num)
    
```

An example of sentiment extracted from twitter tweet :

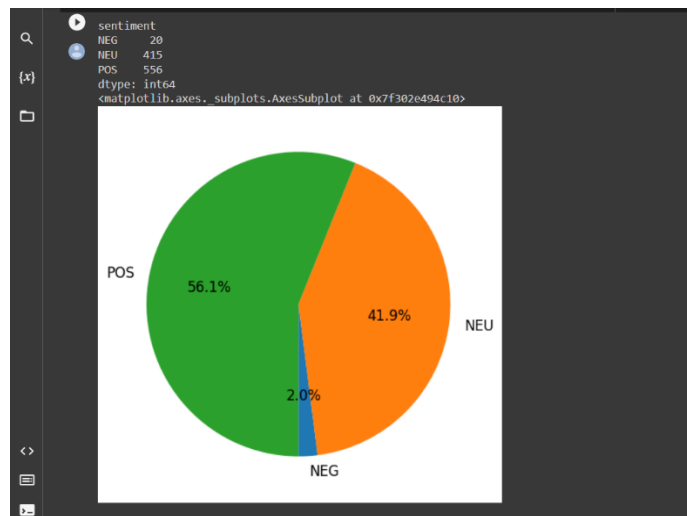


tweet	sentiment
0 @jameygannon @NotionHQ A regression imo, I think it's great to have both the previous way and current way implemented if done right. Because the new way has benefits, there's just way more friction to get there.	Positive
3 @FlowRadarcom @TemplarDesign @mmduarte @airtable @RowsHQ @NotionHQ @coda_hq @softr_io @webflow @AdaloHQ @glideapps @bubble @WordPress Database limitation is the red glad holding me back from going full scale with WF	Neutral
4 @TemplarDesign @FlowRadarcom @mmduarte @airtable @RowsHQ @NotionHQ @coda_hq @softr_io @webflow @AdaloHQ @glideapps @bubble @WordPress Webflow hasn't yet rob off me because of the CMS database limitations. Not enough- can't scale with that	Negative

RESULT :



Word cloud for negative tweets



V. CONCLUSION

On concluding , sentiment analysis is a valuable technique for understanding the opinions and emotions expressed in text data. It can be used in a variety of applications, including social media monitoring, market research, customer feedback analysis, and more. However, it is important to note that sentiment analysis is not a perfect tool and has its limitations. It relies heavily on the quality of the data and the accuracy of the algorithms used. It also struggles with sarcasm, irony, and other forms of figurative language that can be difficult to interpret . Overall, sentiment analysis can provide valuable insights when used appropriately and with careful consideration of its limitations. It is an exciting field that continues to develop and improve, and its potential applications are vast .Sentiment analysis has Strong commercial interest because Companies want to know how their products are being reviewed by customers and also Prospective of consumers want to know what existing users think.We have seen that Sentiment Analysis can be used for analyzing opinions in blogs, articles, Product reviews, Social Media websites, Movie-review websites and Chatbot chats where a third person narrates his views. We have also studied NLP and Machine Learning approaches for



Sentiment Analysis and we have analysed that it is easy to implement Sentiment Analysis via Senti WordNet approach than via Classifier approach.

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