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Sentiment Analysis Using Natural Language Processing

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Abstract: ***In recent years, there has been an increasing interest in using natural language processing (NLP) to perform sentiment analysis. This is because NLP can help to automatically extract and identify the sentiment expressed in text data, which is often more accurate and reliable than using human annotation. There are a variety of NLP techniques that can be used for sentiment analysis, including opinion mining, text classification, and lexical analysis. Each of these methods has its own advantages and disadvantages, and the choice of technique will often depend on the type and quality of the text data that is available. In general, sentiment analysis using NLP is a very promising area of research with many potential applications. As more and more text data is generated, it will become increasingly important to be able to automatically extract the sentiment expressed in this data.***

I. INTRODUCTION

Sentiment Analysis is the process of computationally identifying and categorizing opinions expressed in a piece of text, especially in order to determine whether the writer's attitude towards a particular topic, product, etc. is positive, negative, or neutral. There are a few different ways to perform Sentiment Analysis, but the most common approach is to use Natural Language Processing (NLP) algorithms to automatically parse the text and identify words or phrases that indicate positive or negative sentiment. The algorithm then assigns a score to the text based on the number of positive and negative sentiment words it contains.

Sentiment Analysis can be used to analyze a variety of different types of text, but it is most commonly used to analyze social media posts, reviews, or other forms of customer feedback.

Sentiment Analysis is important because it can be used to automatically identify the overall sentiment of a piece of text, which can be helpful for a variety of different applications. For example, Sentiment Analysis can be used to automatically flag customer reviews that are likely to be negative, or to monitor social media posts for early signs of a PR crisis. Sentiment Analysis is often used in combination with other NLP algorithms to perform tasks such as topic modeling or text classification. It can also be used on its own to identify the sentiment of a piece of text. The task of sentiment analysis is to classify the polarity of a given text. The polarity can be positive, negative or neutral. Sentiment analysis is widely applied to voice of the customer materials such as reviews and survey responses, online and social media, and healthcare materials for applications that range from marketing to customer service to clinical medicine.

In this project, we will use the Twitter API to fetch tweets about a particular topic and then use the Natural Language Processing technique to analyze the sentiment of the tweets.

The public API: This is the default level of access and does not require any authentication. It provides read-only access to public information such as tweets, search, and user profiles.

In this project, we will be using the public API.

Polarity is the attitude or opinion of the speaker, whereas subjectivity is the personal nature of the opinion. In other words, polarity is about what is being said, and subjectivity is about who is saying it.

Polarity is often expressed in terms of degrees, with -1 being the most negative, 0 being neutral, and +1 being the most positive. Subjectivity is usually expressed as a binary value, with 0 being objective and 1 being subjective.

Polarity and subjectivity are often related, but they are not the same thing. It is possible to have a positive opinion that is not subjective, or a negative opinion that is subjective.

Subjectivity is often seen as a bad thing, as it can make opinions seem biased. However, it is important to remember that everyone has their own subjective experiences and opinions. It is what makes us all unique.

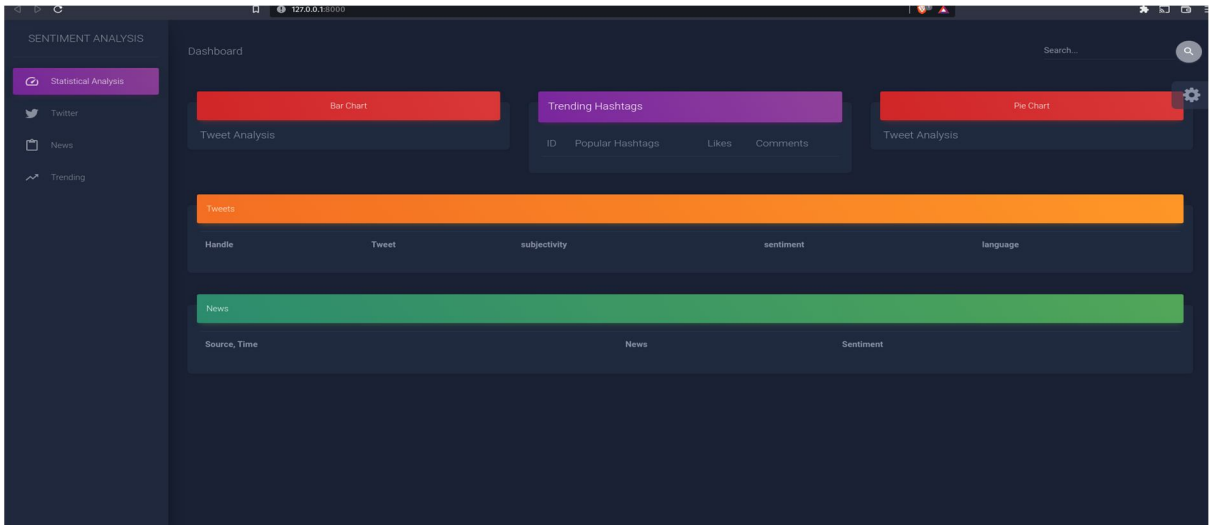
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II. RELATED WORK

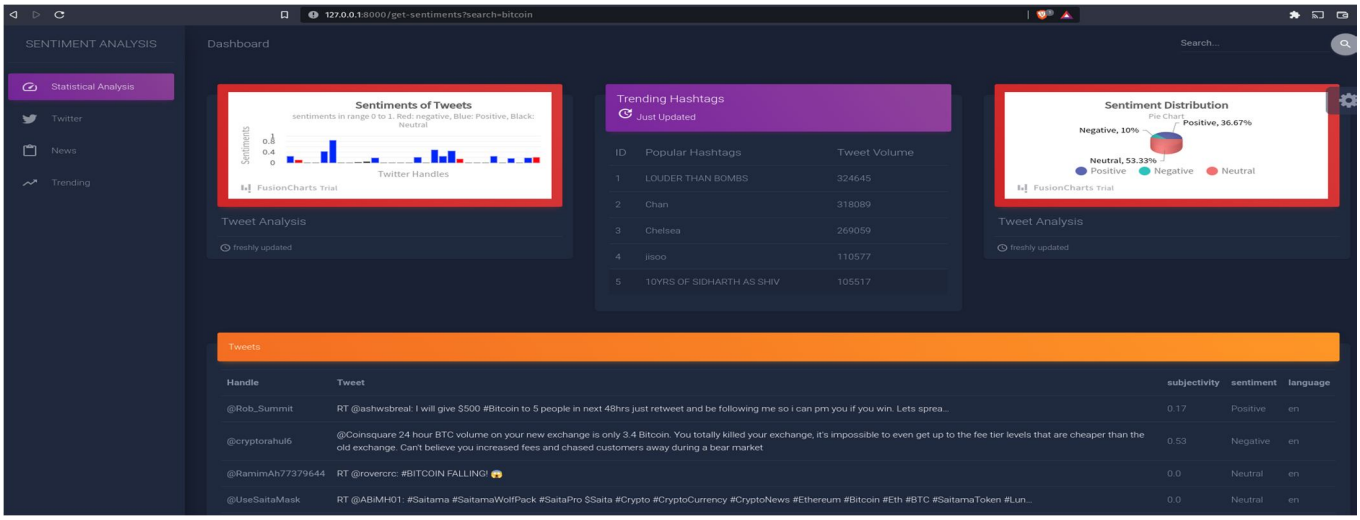
The area of Sentiment Analysis is an upcoming field that is becoming increasingly important to understand public opinion on products and topics. However, NLP is still not widely used and its complexity can be a barrier for the average person. This is where data visualization can be helpful. By presenting the data in an easy to understand format, such as graphs and charts, people can get a better grasp of the sentiment of a particular product or topic.

Benefits over conventional methods

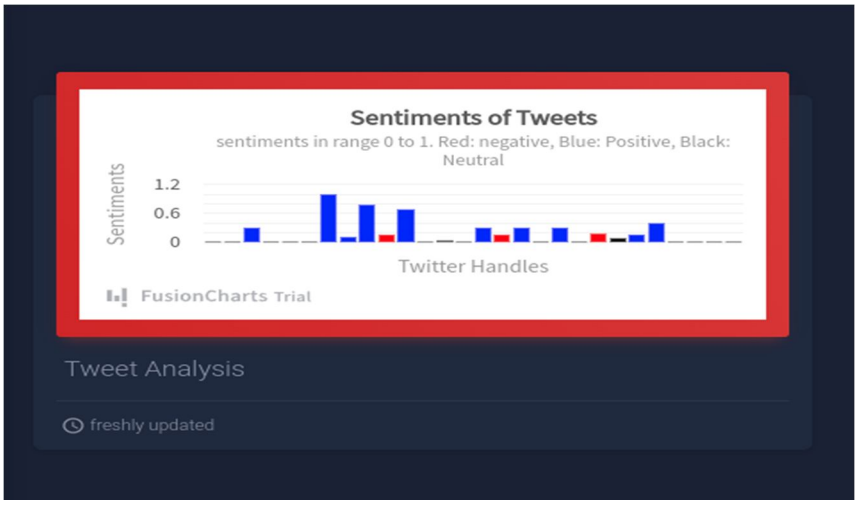
1) Easy to use.
2) Removes average as per week.
3) Multiplatform
4) Light-weight
5) Has bar graphs for easy understanding.



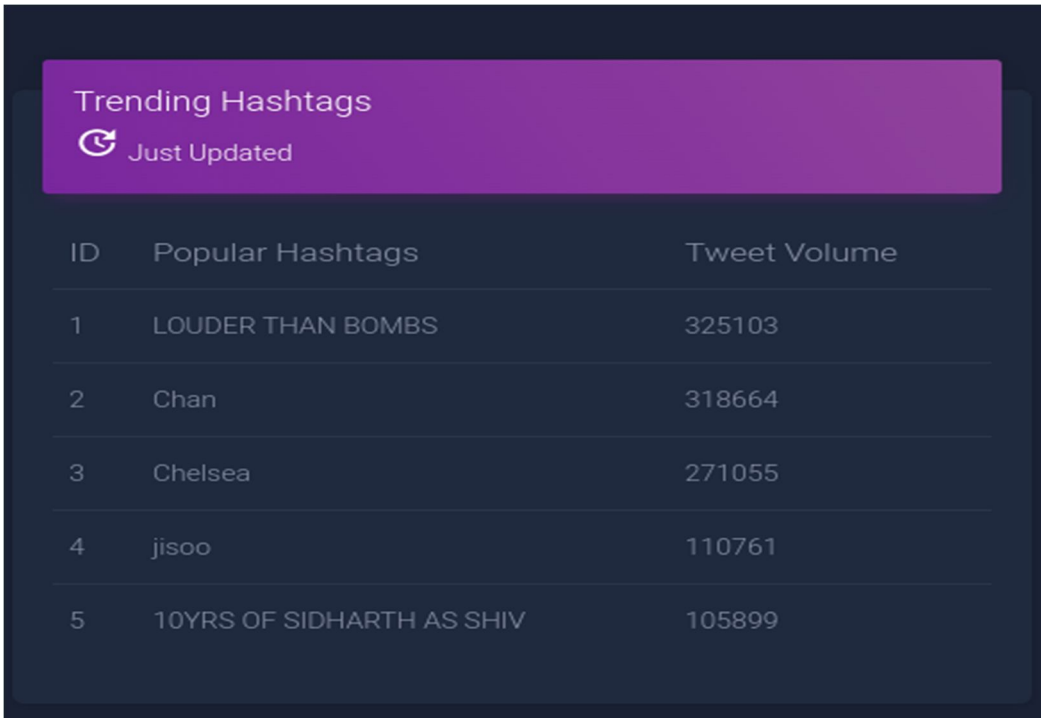
This is the home page of our application.On the left side of the page we have set different options to navigate on the page. We have provided the option for the news as per based on the google data.The latest trending of the tweets are been displayed. On the right side of the page we have provided an option to search any topic of your choice.
For eg:- Searching about bitcoin.



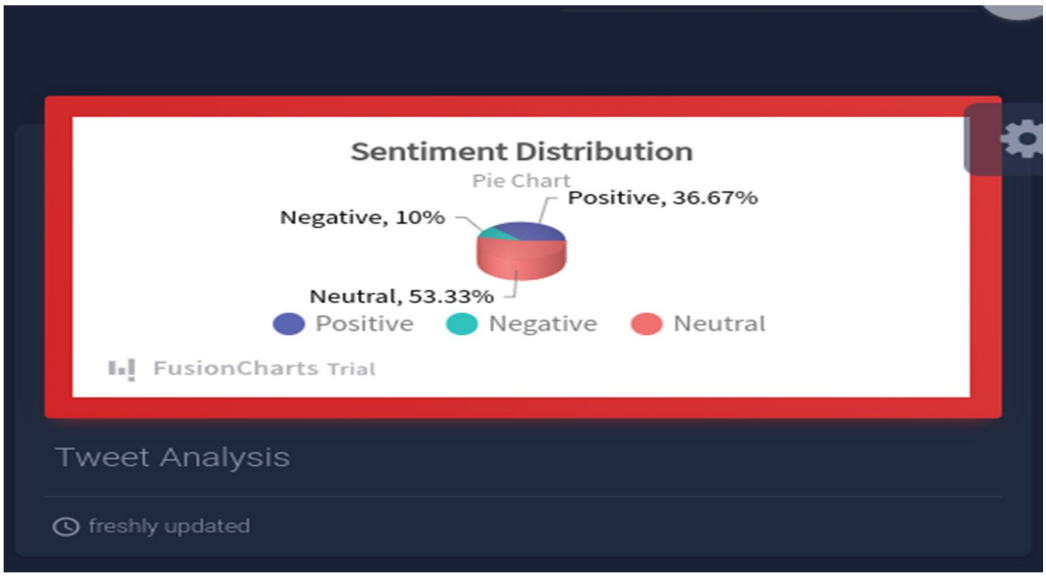
So after searching about bitcoin on the top left of the page all the data from the tweets and news articles from google are analyzed and represented in concise user understandable format.



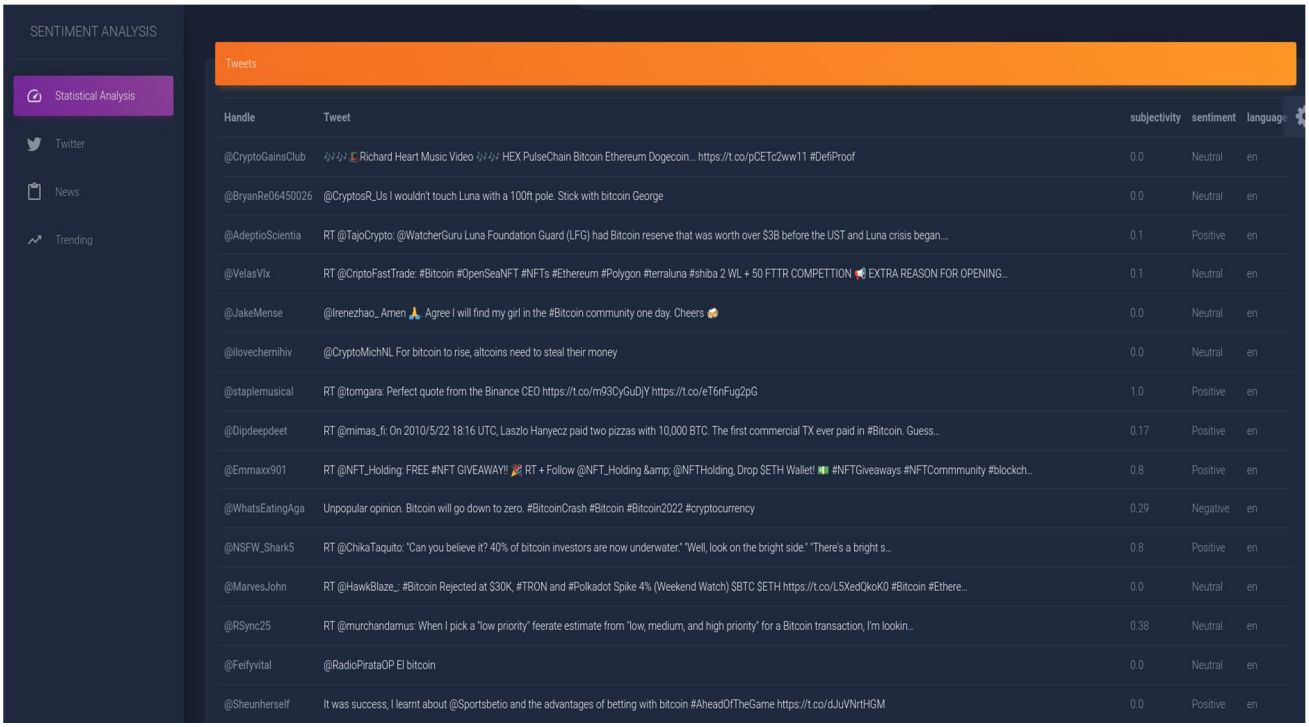
The first graph shows the average sentiments on the perticular topic in this case bitcoin.
The red bar represents negative sentiments on the tweet while the blue bar represents positivity on this topic.
There are also black bars that represent neutral sentiments.
As you can see from the graph people are very positive about bitcoin mixed with some negativity.



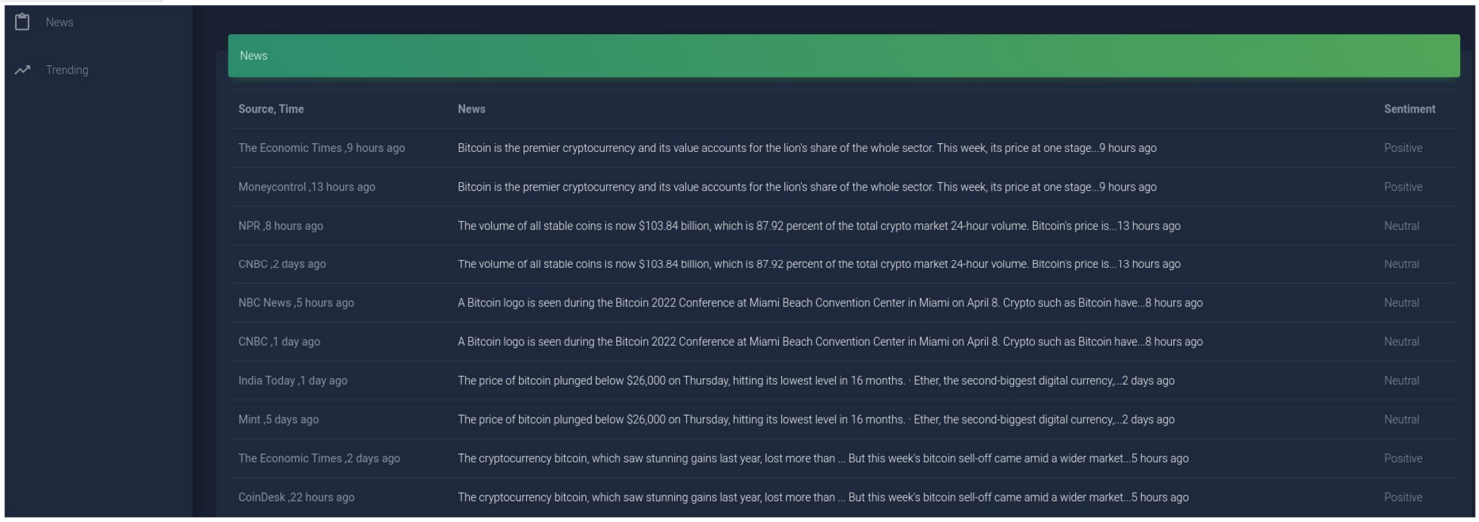
This particular graph represents the daily average of the respective tweet.
Here are the top 5 tweets calculated by twitter. The top 5 tweets are calculated on the basis of the tweet volume and are numbered accordingly.



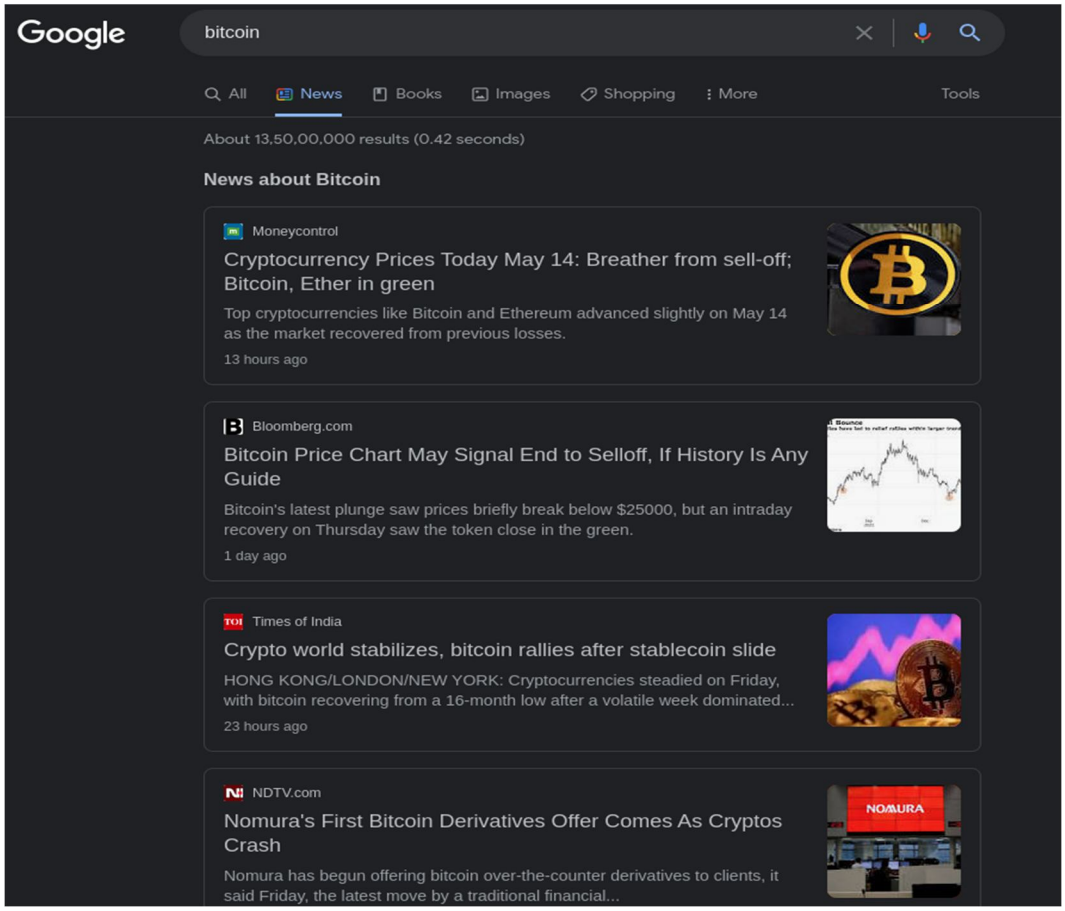
Here the pie chart represents the positive, negative and the neutral data. Different colors are assigned based on the polarity. The pie chart makes it easier to get the overview of the analysis.



Below the graphs is the list of the 20 recent tweets. The tweets are clickable and on clicking it takes you to the exact tweet. Along with the tweet it shows the subjectivity of the tweet along with its sentiments (positive / negative / neutral) it also shows what language the tweet is in.

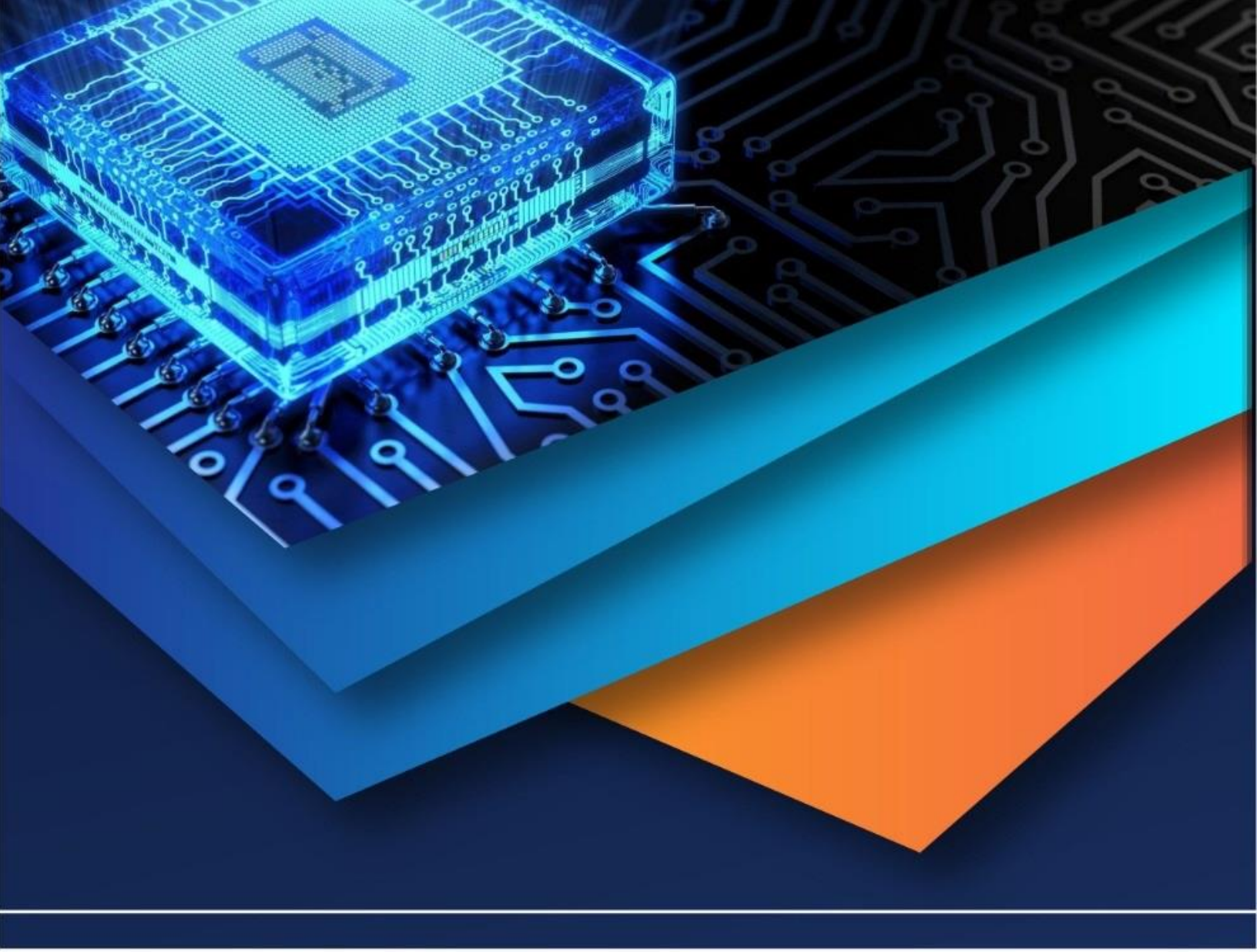


Below the tweets we have the news section. The news section contains the top 10 articles fetched from google. It provides you with more information about that topic and also analyzes the sentiments of the article.



III. CONCLUSION

In the business world, sentiment analysis can be used to track customer satisfaction levels, to gauge public opinion about a company or product, or to monitor employee morale. It can also be used to predict stock market movements. These are the few uses of sentiment analysis. And with our application we would like this to be accessible to the masses.



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