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WhatsApp Chat Analyzer Using Artificial Intelligence

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ABSTRACT:The WhatsApp Chat Analyzer is a software tool designed to extract and analyze data from WhatsApp chats. The tool is capable of processing large volumes of chat content. The analysis can reveal patterns in the chat, such as the most frequently used words or topics discussed, the most active participants, and the time and date of messages. The analyzer can also detect sentiment and emotion in the messages, allowing users to understand the tone and context of the conversation. Overall, the WhatsApp Chat Analyzer provides a powerful way to gain insights into WhatsApp chats and understand the dynamics of group communication.

KEYWORDS:Text analytics, Natural Language Processing (NLP), Sentiment analysis, Rule Based Model; Word Cloud

I. INTRODUCTION

With over 2 billion active users globally, WhatsApp is one of the most widely used messaging services. The amount of conversation data collected by the app's users likewise grows as its usage continues to rise. Due to this, there is an increasing need for technologies that can extract information from WhatsApp discussions. An application created to address this need is the WhatsApp Chat Analyzer. With the help of the WhatsApp Chat Analyzer, you may analyse chat data in depth and learn more about the talks. Large amounts of chat data may be processed by the program, which can also extract pertinent data and produce visualisations that make it simple to comprehend conversation dynamics.

Users may comprehend the tone and context of the discussion by using the WhatsApp Chat Analyzer, which can also identify mood and emotion in the messages. Understanding the general tone of the discussion and seeing possible disagreements or trouble spots are two uses for this capability.

II. RELATED WORK

Previous research on WhatsApp chat analysis has been conducted in various domains, including customer service, social media monitoring, and marketing campaigns [1], [2], [3]. Researchers have explored different techniques for sentiment analysis, such as lexicon-based, machine learning, and hybrid approaches [1], [3], [4], [5].

To improve the quality of hotel services, Kim et al. (2020) studied WhatsApp client feedback using a lexicon-based technique to distinguish between positive and negative sentiment in customer feedback [4]. The findings of the sentiment analysis were connected with the customers' overall happiness with the hotel's services, the researchers discovered.

A hybrid methodology was utilised in different research by Alharbi et al. (2019) to examine tweets and WhatsApp messages pertaining to the Saudi Vision 2030 project [1]. The classification of sentiment into positive, negative, and neutral categories was done by the researchers using lexicon-based analysis and machine learning techniques. The study demonstrated that social media sentiment analysis may be a useful tool for tracking public opinion and shaping policy choices.

De et al. (2018) explored the use of WhatsApp for customer service in the hospitality industry and found that it was an effective and efficient way to communicate with customers [2]. The researchers used a mixed-method approach to analyse customer interactions and identified the most common issues faced by customers.

Jhanwar et al. (2020) studied the impact of WhatsApp marketing campaigns on consumer purchase intention using sentiment analysis [3]. The researchers used a machine learning approach to analyse sentiment and found that positive sentiment in WhatsApp messages had a significant impact on consumer purchase intention.



Finally, sentiment analysis in group chats on WhatsApp has also been investigated. Thakur et al. (2020) explored sentiment analysis in group chats related to COVID-19 and found that the sentiment varied significantly across different countries and regions [5].

III. METHODOLOGY

The methodology used for the WhatsApp Chat Analyzer involves the use of Natural Language Toolkit (NLTK) and the VADER (Valence Aware Dictionary and sEntiment Reasoner) lexicon for sentiment analysis. The NLTK is a Python library that provides tools and resources for natural language processing, including sentiment analysis. VADER is a rule-based sentiment analysis tool that is specifically designed for social media text and uses a lexicon of words and phrases to determine the sentiment of a piece of text. The following are the detailed steps involved in the methodology for the WhatsApp Chat Analyzer using NLTK VADER:

- 1) Data pre-processing: The chat data was pre-processed to remove stop words, punctuation, and other unnecessary characters that do not add value to the sentiment analysis. This helped improve the accuracy of the analysis.
- 2) Sentiment analysis: Using the VADER lexicon, which gives sentiment ratings to the text based on the presence of positive or negative words and phrases, the pre-processed chat data was examined. The lexicon can comprehend slang, acronyms, and emoticons because it was created expressly to handle social media communication.
- 3) Aggregation: Users may get a rough sense of the mood and tone of the conversation by looking at the overall sentiment score for the chat that was generated by averaging the sentiment ratings across time.
- 4) Visualization: The overall sentiment score was visualized using charts or graphs, providing users with an easy-to-understand representation of the chat's sentiment. The visualizations can help identify trends or patterns in the chat's sentiment over time.
- 5) Keyword analysis: In addition to sentiment analysis, keyword analysis was performed to identify the most frequently used words and topics discussed in the chat, providing additional insights into the chat's content..

The methodology using NLTK VADER offers an efficient and accurate way to analyze chat data and detect sentiment. It can help users gain valuable insights into WhatsApp conversations, including the mood and tone of the conversation and the topics of interest or concern..



(a)

Fig.1.System Architecture and flow



IV. EXPERIMENTAL RESULTS

The user interface (UI) of the website was developed with Streamlit and made available from anywhere by utilizing Streamlit Cloud, which offers hosting services which is visible in fig a.

In fig.b Users get access to files saved on their personal devices through the browse option for use in sentiment analysis. It is important to note that the server does not save these files, guaranteeing the safety and confidentiality of the user's private communications. With this functionality, users have a simple and safe method to use their own data for sentiment analysis without having to be concerned about security or privacy lapses.

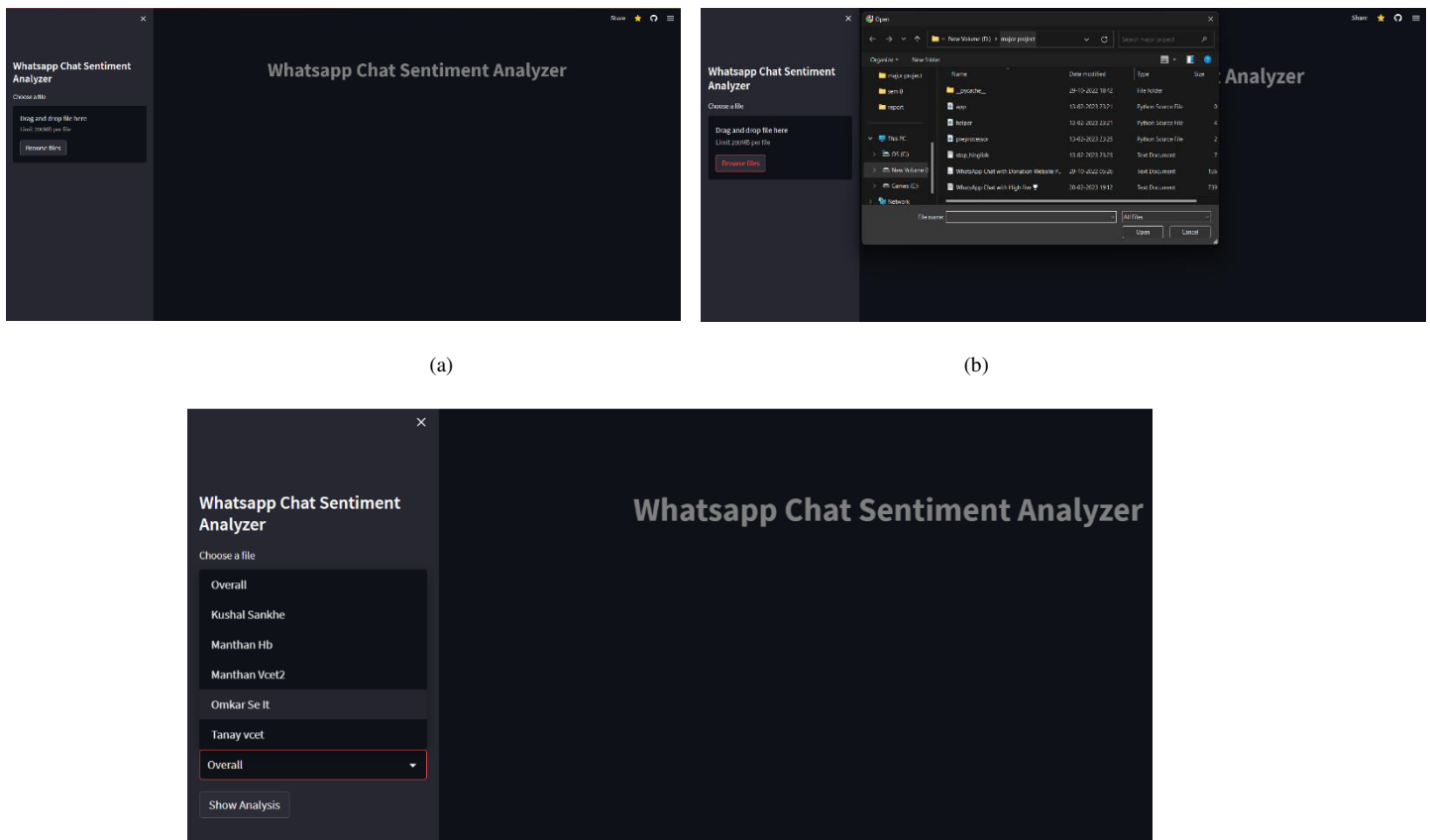


Fig. 2. Interface Showcase (a) UI and Introduction to the website (b) Browsing Window (c) Uploaded files shows name of members present in the chat.

The WhatsApp Chat Analyzer system starts by recognising the distinct users present in the chat after the user uploads the chat data file into it in fig c. With this tool, users may either analyse the sentiment of the entire group or just a few particular conversation participants.

Several intriguing conclusions emerged from the examination of the WhatsApp discussion in fig a. using a rule-based sentiment analyzer. September had a sentiment score up to 50, making it the most upbeat month.

Businesses may learn about a user's mindset by examining their chat contributions and determining whether they were good, negative, or neutral as shown in fig b.

Monitoring user contributions and classifying them as good, negative, or neutral is a useful strategy for companies looking to gauge the attitudes of chat users. This can offer practical insights for enhancing client engagement and happiness.

The phrases "join" and "problem," which were used 250 and 100 times, respectively, most frequently in the positive session, according to our analysis of the chat data which can be seen in fig c.

The sentiment analysis's findings imply that the majority of WhatsApp chatters had favourable feelings about the project was being discussed. This could be because to a variety of things, including the individuals' individual views, their social and cultural background.



The rule-based algorithm that was utilised for the sentiment analysis was built on a set of pre-established rules that categorised messages depending on the presence of particular keywords, emoticons, or punctuation marks. This strategy has the benefit of being very straightforward and simple to adopt, but it also has significant drawbacks. For instance, the computer could be unable to adequately capture the subtleties and complexity of human expressions and emotions, misclassifying communications as a result.

Furthermore, because the mood of a chat might change depending on the subject, the participants, and the cultural and sociological elements that affect their behaviour, the rule-based algorithm utilised in this investigation may not be generalizable to different WhatsApp chats or circumstances.



Fig.3. Visualizing Data x(a) Monthly and daily activity maps (b) most positive, negative and neutral members contribution (c) Word cloud showing frequently used words

V. CONCLUSION

In conclusion, the NLTK VADER-based WhatsApp conversation sentiment analyzer offers a useful method for assessing the sentiment of WhatsApp talks. The application enables the accumulation of sentiment ratings over time, giving insights into the conversation's general atmosphere and tone. The keyword analysis capability also makes it



possible to identify terms and subjects that come up frequently, adding more context to the chat's content. When analysing the tool's results, it's crucial to keep in mind its limitations, including the rule-based methodology, lack of context, inability to identify specific speakers, and limited language support.

Future research on the WhatsApp conversation analyzer has a lot of potential. Expanding language support to enable more precise sentiment analysis in languages other than English is one area for advancement. Research might also be done to enhance the tool's capacity to recognise context and discriminate between various speakers in group discussions. The creation of a sentiment analysis method based on machine learning is another potential area for future research since it might more accurately represent the complexity of human language. In order to give a more thorough understanding of WhatsApp chats, more study may be done on the use of sentiment analysis in conjunction with other natural language processing approaches.

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