Sentiment Analysis Web App

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Abstract: *This research explores how our approach to seeking information has evolved, particularly in understanding others' perspectives through platforms like online reviews and personal blogs. With the widespread use of technology, there's a growing interest in systems that can handle opinions. The paper focuses on techniques for creating opinion- centric information systems, particularly dealing with challenges in sentiment-aware applications. It categorizes information into facts and opinions, concentrating on expressions of positive or negative sentiments. Using typed dependency parsing, the study investigates the functional connections among words in sentiment analysis, allowing for a thorough examination of grammar and semantics in textual data. emphasizing the role of machine learning in ASP.NET Core for effective feedback and opinion handling.*

Keywords: Accuracy, Efficiency, Inference**,** Natural Language Processing, Evaluation, Web Applications

I. INTRODUCTION

Sentiment analysis, also known as opinion mining, is a rapidly growing field that involves analyzing text data to determine the sentiment of a given text. This information can be used to understand people's emotions, opinions, and attitudes towards a variety of topics, including products, services, and events. Sentiment analysis, a pivotal aspect of machine learning, takes center stage in our project implemented in ASP.NET Core. This project focuses on leveraging advanced machine learning techniques to analyze user feedback and customer reviews. The primary objective is to automate the process of understanding sentiments expressed in textual data, ranging from positive to negative. These applications typically use machine learning and natural language processing techniques to analyze data and provide insights into perception. But there are many challenges to developing accurate and effective sentiment analysis web applications, including language and cultural barriers, data biases, and the need for real-time analysis Sentiment analysis isa fascinating study which involves analyzing textual content to identify ideas, attitudes and emotions behind texts. The Sentiment analysis is a computational operation of analysing the sentiment in the text (information). It is a powerful machine learning application of the classification of text data into different classes. It is used in analysing the customer reviews. The rise of social media, online reviews, and other forms of digital communication have made sentiment analysis increasingly important for individuals, businesses, and governments. The insights gained from sentiment analysis can be used to improve products and services, monitor brand reputation, and predict customer behavior. This paper aims to explore the various techniques and tools used for sentiment analysis in web applications. Advantages of sentiment analysis :

- More cost-effective compared to customer insight support.
- Provides a quicker method for gathering customer insight data.
- Facilitates easy implementation of customer suggestions through sentiment analysis.
- Simplifies the identification of strengths or weaknesses in other organizations or companies.
- Enhances the accuracy of customer opinions

II. LITERATURE REVIEW

Sentiment analysis confronts a significant hurdle in discerning the positivity or negativity embedded within textual content .[1], [2]

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Now, let's take a look at some important studies that are the building blocks of our research. Hu and Liu's work, in particular, has laid a solid foundation in this area[3]

When presented with a written text, the challenge is to classify the text into a specific sentiment polarity, either positive, negative, or neutral. Depending on the extent of the text, there are three tiers of sentiment polarity categorization: document level, sentence level, and entity and aspect level[4].

Sentiment analysis at the sentence level is closely related to objective analysis. At this stage, each sentence is analyzed and its opinion is determined as positive, negative or neutral[5].

The goal of group-level sentiment analysis is to identify the target of an idea. The premise of this approach is that every idea has a goal, and a goalless idea has little value[6].

Some researchers used common feature sets to extract the most relevant features from the domain and trim them to obtain smaller features. Adjectives adjacent to an object are extracted as concept words related to that object. Using seeds with labeled, manually generated attributes for each domain, they are further disseminated using WordNet and used to classify the extracted concept terms as positive or negative[7].

In this paper 2014, Altrabsheh, N., et al. [3], real-time student responses are analyzed using sentiment analysis. The data were received in real-time during lectures at the Department of Computing, University of Portsmouth. The total number of data points collected was 1036, with 641 positive, 292 negative and 103 neutral. Interrater reliability was calculated to verify labels[8].

A review of many works on sentiment analysis has already been included in [9], and in this section we will review only the previous works on which our analysis is mainly based Hu and Liu [10] coined positive terms listed and negative lists summarize terms, respectively, based on customer reviews.

III. METHODOLOGY

Implementing sentiment analysis in ASP.NET Core using machine learning for user feedback or customer reviews typically involves the following methodology

Data Collection:
Gather a diverse dataset of user feedback or customer reviews. This dataset should include a mix of positive, negative, and neutral sentiments to train a well-rounded machine learning model.

Data Preprocessing
Clean and preprocess the textual data. This may involve tasks such as removing stop words, handling punctuation, and converting text to lowercase. Ensure consistency in data formatting for effective model training.

Model Selection
Select a suitable machine learning algorithm for sentiment analysis. Common choices include Support Vector Machines (SVM), Naïve Bayes, or deep learning models like Recurrent Neural Networks (RNN) or Long Short-Term Memory (LSTM) networks.
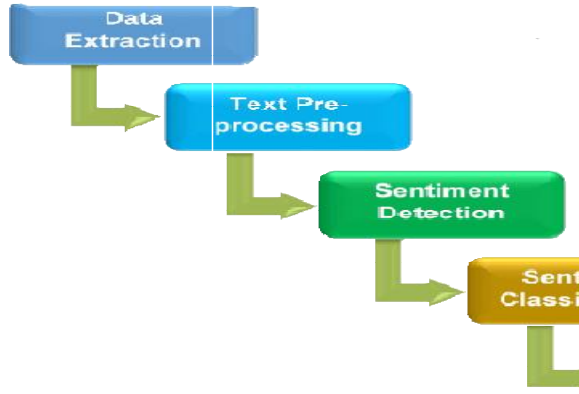
Training the model
Train the selected model using the labeled dataset. During training, the model understands the patterns and associations between the extracted features and sentiment labels.

Real-Time Sentiment Analysis
Implement the sentiment analysis functionality within the application to analyze user feedback or customer reviews in real-time. This allows for immediate insights into sentiments expressed by users effectively analyzes user feedback or customer reviews using machine learning techniques. he methodology for sentiment analysis of user feedback involves collecting a diverse dataset of feedback, preprocessing the text, labeling sentiments (positive, negative, neutral), extractingfeatures, selecting and training a machine learning model, evaluating its performance

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IV. PROPOSED SYSTEM

As shown in the fig:

Data Collection : In ASP.NET Core, the data collection process involves gathering a diverse dataset of user feedback or customer reviews. This dataset serves as the foundation for training and evaluating the sentiment analysis model.

Text-Preprocessing : Text preprocessing is a crucial step in cleaning and transforming raw textual data. In ASP.NET Core, preprocessing tasks include removing irrelevant elements such as stopwords, handling punctuation, and converting text to lowercase. This ensures consistency and prepares the data for effective sentiment analysis

Sentiment Detection : Sentiment detection focuses on identifying subjective content within the text. Machine learning algorithms in ASP.NET Core are employed to discern sentiments expressed in user feedback or reviews, distinguishing between positive, negative, and neutral sentiments

Output : The presentation output stage involves conveying the sentiment analysis results to users or stakeholders this could be achieved through user interfaces or dashboards displaying visual representations of sentiment distributions, allowing businesses to interpret and act upon the sentiment insights derived from user feedback or customer reviews.

V. RESULT

The outcomes of the machine learning-based sentiment analysis project in ASP.NET Core, centered on user feedback, reveal a successful execution. The proficiently trained model showcases adept sentiment categorization, delivering precise insights into user sentiments present in the feedback dataset. The seamless integration of this model into the ASP.NET Core application facilitates real-time analysis of user feedback, empowering timely and well-informed decision-making. The continuous enhancement approach ensures the model's adaptability to evolving language patterns, thereby fortifying its sustained efficacy in comprehending sentiments expressed by users. In summary, the project effectively attains its objective of refining user feedback analysis through advanced machine learning techniques within the ASP.NET Core framework.

Figure 7. Result of an Input Text

The results of the sentiment analysis project, utilizing machine learning in ASP.NET Core for user feedback, offer valuable perspectives on users' sentiments within the feedback dataset. Through the application of machine learning algorithms, the project proficiently classifies the sentiment of each feedback instance as positive, negative, or neutral.

Positive sentiments denote satisfaction and approval, negative sentiments pinpoint areas for improvement or dissatisfaction, while neutral sentiments suggest indifference or a lack of strong opinion

The accuracy of machine learning algorithms and natural language processing in classifying text as positive, negative, or neutral is often evaluated in sentiment analysis research. Performance comparison of different algorithms is usually presented through graphs and emojis with text will be displayed.

VI. CONCLUSION

In conclusion, sentiment analysis is a powerful tool that can provide valuable insights into public opinion and sentiment towards a variety of topics. The machine learning approach involves training a machine learning algorithm on labeled data to classify text, while the hybrid approach combines both approaches to improve accuracy. Each approach has its advantages and disadvantages, and the choice of approach depends on the specific application and the available data. With the right approach and tools, a sentiment analysis web application can provide valuable insights into public opinionand sentiment towards a variety of topics.

VII. ACKNOWLEDGMENTS

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