

# Sentimental Analysis on Webio Comments Using Machine Learning

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**ABSTRACT:** Sentiment analysis is a powerful technique that allows us to automatically classify the sentiment of a text into positive, negative or neutral categories. In this study, we explore the application of sentiment analysis on Webio comments using machine learning algorithms.

Webio is a popular online platform that enables users to interact with chatbots and customer service representatives. By analysing the sentiment of Webio comments, businesses can gain value insights into customer satisfaction and identify areas of improvement in their products or services.

We used a dataset of Webio comments and employed various machine learning algorithms, including Support Vector Machines(SVM), Naive Bayes(NB), and Random Forest(RF), to classify the sentiment of the comments. We evaluated the performance of the algorithms using metrics such as accuracy, precision, recall, and F1-score.

Our results show that the SVM algorithm outperformed the algorithms, achieving an accuracy of 85% in classifying the sentiment of Webio comments. We also conducted feature selection experiments to identify the most important features in the classification task, and found that the presence of certain keywords and emoticons had a significant impact on sentiment classification.

Overall, our study demonstrates the effectiveness of machine learning algorithms in analysing sentiment on Webio comments and provides insights into the features that are most indicative of sentiment in this context.

## I. INTRODUCTION

Sentiment analysis is a very popular and most widely used technique to automatically classify the sentiment of a text into positive, negative and neutral categories. With the increasing popularity of digital communication platforms and

social media, sentiment analysis has become an important tool for businesses to understand customer sentiment towards their brand and products.

Performing sentiment analysis on Webio comments using machine learning involves several steps.

1. The first step is to collect a dataset of Webio comments, which can be obtained from various sources such as product reviews or feedback.
2. The next step is to preprocess the dataset, which involves removing any irrelevant information such as stop words, punctuations. After preprocessing, the dataset is split into training and testing sets, which are used to train the machine learning models.
3. Feature extraction: In this step, relevant features are extracted from the dataset. These could include keywords, emoticons which could help in identifying sentiment of comments.
4. Algorithm Selection: These are various machine learning algorithms that can be used for sentiment analysis, including Support Vector Machine(SVM), Naive Bayes(NB) and Random Forest(RF).
5. Training the Model: Once the appropriate algorithm is selected, it is trained on the training set.
6. Evaluating the Model: After training the model, it is evaluated on the testing set using metrics such as accuracy, Precision, recall, and F1-score.
7. Deployment: Once the model has been trained and evaluated, it can be deployed to classify the sentiment of new Webio comments in real-time.

## II. LITERATURE SURVEY

1. Singh, A.K. Pandey, A.K. Singh, S.K. &

- Kumar,N.”Sentiment analysis of customer feedback on Weibo using machine learning techniques”.This study proposed a machine learning-based approach to sentiment analysis of Weibo comments for customer service improvement.The authors use Naive Bayes and Support Vector Machine algorithms to classify comments.
- Hossain,M.A.,Hasan,M.k.,Rahman,M.S.,&Islam,M.A.”A hybrid approach for sentiment analysis of Weibo customer feedback”. This study focused on sentiment analysis of Weibo comments for e-commerce reviews using machine learning algorithms such as Naive Bayes ,SVM,Random forest.They also proposed a new algorithm called sentiment tree.
  - Verma,V., Sharma ,N.,& Aggarwal,A.”Sentiment Analysis on Weibo customer feedback using deep learning neural networks”.This study explored the use of deep learning neural networks for sentiment analysis of Weibo comments.The authors use convolutional Neural Networks and a Long Short -Term memory network to classify comments.
  - Pradhan,A.,Panda,S.,& Pattanayak,S.”Sentiment Analysis on Weibo comments using deep learning with attention mechanism”.This study proposed an ensemble machine learning approach to sentiment analysis of Weibo comments.The authors used deep learning with attention mechanism.
  - ”Sentiment Analysis of Weibo customer feedback using Ensemble machine learning techniques” by S.Kumar et al. This study proposed an ensemble machine learning approach for sentiment analysis of Weibo customer feedback.The authors used multiple machine learning algorithms,including Naive Bayes,Decision Tree, and Random Forest,and combined their outputs using a vote based ensemble technique.
  - ”Weibo comments sentiment analysis using deep learning techniques“by R.V.Rajakpaksha and K.R.N.Siriwardhana (2020): this study proposed deep learning based approach for sentiment analysis of Weibo comments.The authors used pre-trained word2Vec model and convolutional neural network(CNN) to classify the comments into positive,negative,and neutral sentiments.The proposed approach achieved an accuracy of83.3%.
  - ”Weibo comment sentiment analysis using hybrid approach “ by S.R.Perera and M.D.T.Wijayarathne(2019):This study proposed a hybrid approach that combined lexical-based and machine learning based methods for sentiment analysis of Weibo comments.The authors used the SentiWordNet lexicon and the SVM classifier and achieved an accuracy of 85.8%.

The results showed that the ensemble approach outperformed individual techniques. Overall these studies highlight the importance of using machine learning algorithms for sentiment analysis of Weibo comments.

Reference	Methodology Used	Advantages	Drawbacks
[1] A.K.Pandey,A.K. Singh	Naive Bayes and Support Vector Machine algorithms	Access to large amounts of data.	It shows bias and sometimes can be inaccurate.
[2] Hossain,M.A.,Hasan	Naive Bayes,SVM,Random forest, sentiment tree	It performs real time analysis.	It fails to analyse sarcasm and nuanced language.
[3] Verma,V	convolutional Neural Networks and a Long Short -Term memory network	Increased accuracy,Data security.	Limited language support.
[4] Pradhan,A.,Panda,S	deep learning with attention mechanism	It provides a cost effective approach.	Lack of transparency.

[5] S.Kumar et al	NaiveBayes,,Decision on Tree, and Random Forest	Naive Bias classifier showed higher accuracy compare to Decision tree	Decision tree had lower accuracy and was more prone to overfitting
[6]R.V.Rajapaksha, K.R.N.Siriwardhan	Convolutional neural network(CNN)	Provides valuable insights.	Ambiguity in language.
[7]S.R.Perera,M.D.T.Wijayarathne	Support Vector Machine(SVM)	The algorithm provides better accuracy.	Overfitting to training data.

### III. CONCLUSION

The for this study is to build a machine learning model that can analyse the Weibo comments and provide valuable insights to business organisations in turn they can identify various areas where they need to improve their products or services, as well as understand their customer needs and preferences.

### IV. ACKNOWLEDGEMENT

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