Proceedings of the 3rd International Conference on Signal Processing and Machine Learning
DOI: 10.54254/2755-2721/6/20230966

Sentimental analysis using machine learning in Twitter dataset

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Abstract. The analysis of sentiment is also known as opinion mining. Observation of sentiment is used for detecting different emotions of people through the feedback given by them. It is done to know whether the customer is satisfied by the organization's product, service and so on. Nowadays rating the product or service becomes very essential and important in everyone's life. These are nothing without rating the sentiments of the customer. It is absolutely essential to collect the sentimental data since it helps in improving the product or its service, to satisfy the customer and to increase the sale. In this fast-changing world, Twitter is one of the most used and biggest sensation creating apps. Twitter is mostly used for delivering thoughts of people. This process is known as sentimental delivery. This research analysis is done with the help of views, likes, comments and shares of a particular tweet. The output of this analysis might be positive, negative or neutral. Machine learning is an algorithm or a method in which the task is conducted by an AI system. In this output value is predicted from the given input data.

Keywords: Sentimental analysis, emotions, product, rating, twitter data, Machine learning

1. Introduction

Sentimental analysis is also mentioned as excavation of opinions. It is useful in detecting the different emotions of people. It is an approach which picks out the tone of the emotion in a text given by the people who are the customers of a product, brand, or services and so on. It is the popular way of classifying and deciding opinions used by most of the organizations. This process uses many techniques like Data Mining and Web mining, and the technique called Artificial Intelligence, Deep and Machine Learning to extract data for processing. Sentimental analysis concentrates on contradiction of a text like positive, negative and neutral. It also helps to detect specific feelings like happiness, sadness, anger and so on.

There are different types of sentimental analysis. The most popular type is the Graded observation which gives results of analysis in positive or very positive, neutral, negative or very negative manner. It can simply be portrayed as 5-star ranking, for instance: very Positive = 5, very Negative = 1 and so on. Let's assume an example of food delivery service. In food delivery services, the customer rates the

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delivery guy by star method. It depicts how the service is provided for the customer including delivering time, correct delivery place, delivering the food safely and neatly, etc,. In this modern world, different apps are used for different purposes including games, apps for studying, purchasing things, entertaining, earning and so on. These are nothing without rating the sentiments of the customer. It is absolutely essential to collect the sentimental data since it helps in improving the product or its service, to satisfy the customer and to increase the sale.

Emotion detection is a type of sentimental analysis which detects emotions like happiness, sadness, anger, frustration, etc. Aspect-based Sentiment Analysis is another type which is similar to the Graded system. This method detects the particular problem of a product in a very deep manner. Nowadays, sentiment analysis tools are essential to detect sentiment for all kinds of data. Sentiment Analysis is most importantly used in social media. In social media, it is very easy for customers to reveal their conception more precisely than other ways. The feedbacks of customers are expressed in views, likes, comments and sharing of a product's information.

The benefits of sentiment analysis are Data Sorting, Real-Time observation, Consistent criteria, etc. The observation of sentiment can be automatic, which means machine can learn from the provided data through different machine learning techniques. Machine learning is an algorithm or a method in which the task is conducted by an AI system. In this output is predicted from the given input data. Here, Machine Learning (ML) methods are applied to examine the emotions of customers from the feedback given by them. Though there are many methods in machine learning, KNN, SVM, Decision Tree and Naive Bayes algorithms are widely used for sentiment classification. System methodology is shown in Figure 1.

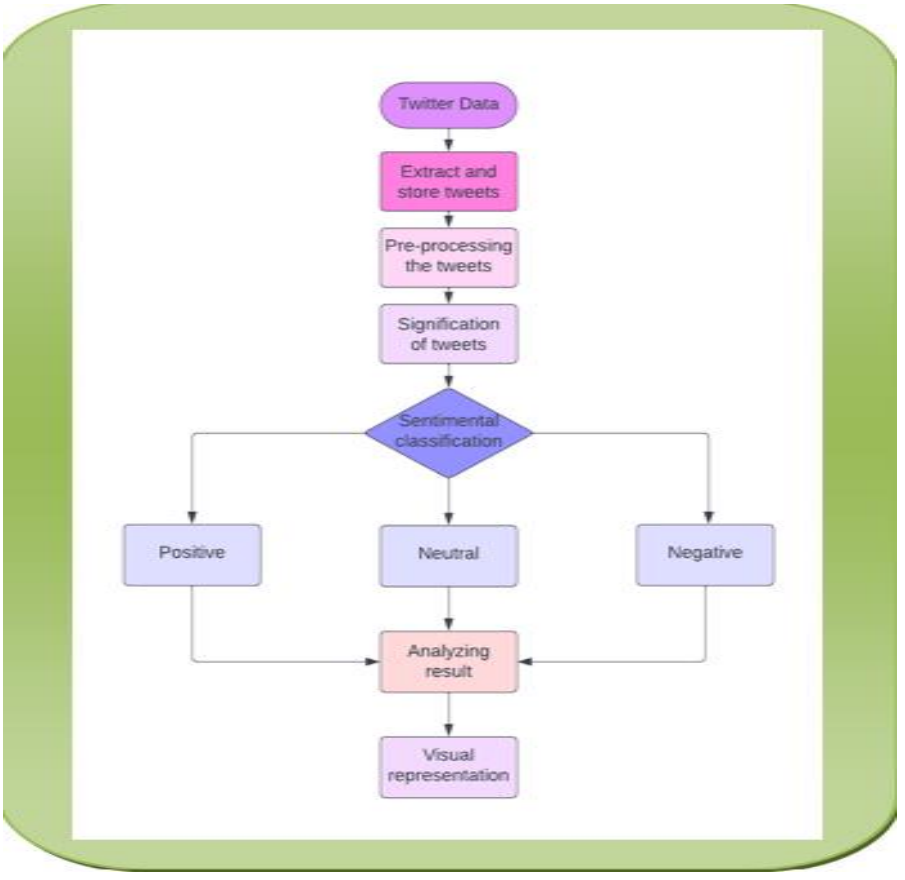

Figure 1. System methodology diagram.

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2. Literature review

Gonzalo A. Ruz et al. (2020) [1] utilized Bayesian network classifiers to carry out sentimental analysis using Twitter data through machine learning. Here, the main problem addressed is sentimental analysis throughout the time of critical events like natural disasters or social movements. The result from the classifier allows identifying the relations amongst tweets, and gives relative information about the situations. Usha Devi Gandhi et al. (2021)[2] proposed a prototype of Memory for Short and Long Term (LSTM) and Neural Network in Convolution mode (CNN) prototype model to carry out sentimental analysis on Twitter data. Here, the opinion or feelings of the users from tweets of various fields are analyzed. The result purpose is to rate the review of movies and identify movies review. Mohammad Abu Kausar et al. (2021) [3] utilized people's tweets from top ten COVID contaminated countries for sentimental analysis. Here, the data taken for analysis are based on tweets posted in English. This analysis is mainly to know the sentiment or way of thinking of people from COVID infected countries [4]. Ashwin Sanjay Neogi et al. (2021) [5] performed TF-IDF and Bag of Words to carry out sentimental analysis on Twitter data concerning farmer's protest. This analysis came upon the fact that Bag of Words is better than TF-IDE. Another well-defined algorithm of machine learning is also employed and the Random Decision Forest has an impeccable classification. Javed Mehedi Shamrat et al. (2021) [6] utilized the Twitter data extracted from Twitter for sentiment analysis concerning COVID-19 vaccines. Here, supervised KNN classification algorithm is used for classification. The results are classified into three: negative, neutral and positive. Barakat AlBadani et al. (2022) [7] introduced a new methodology for sentimental analysis i.e. by integrating the (ULMFiT) fine tuning model of Universal Learning with SVM. Here, In order to enhance the efficiency and precision of the research of data this methodology is employed. The proposed methodology detects the view of mankind towards certain products centered on its tweets. This ensures that the prototype will achieve state-of-art state for all datasets. Shaghayegh Jabalameli et al. (2022) [8] utilized the Twitter data to provide a complete spatial-temporal analysis. The aim of this analysis is to know how mankind was feeling concerning the epidemic, recurrent topic that mankind discussed and how they distracted the people. The result helps to identify the public demands and reaction for situations and go after the effect of officials' policies at territory level and direct their replies in future to the pandemic [9]. Chetanpal Singh et al. (2022) [10] proposed a methodology dependent on strengthened features weighted by attention layer and LSTM-RNN based network. The proposed method is systematically implemented to analysis sentiments of Twitter data.

3. Sentiment analysis of twitter

The tweets of Microsoft, Amazon and Google are taken for sentimental analysis. Among this the number of tweets which was given positively, negatively and in neutral manner is denoted in Table.1. The emotions of the persons are analyzed to produce the results. These tweets are analyzed to improve their business using the feedback of the research [11].

Table 1. Number of tweets tweeted positively, negatively and neutral.

Analysis	Microsoft	Amazon	Google
Positive	606	312	360
Neutral	846	1236	822
Negative	774	576	594

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3.1. Analysis of Amazon

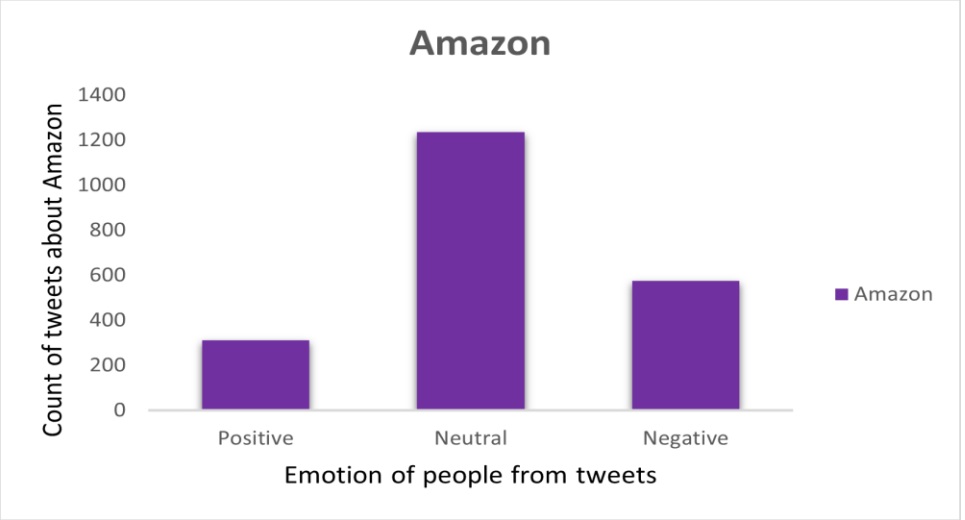

Figure 2. Analysis of Amazon Tweets.

figure 2 shows the number of positive, negative, and neutral comments tweeted about Amazon. This analysis helps us to understand the product satisfaction of Amazon in the field. By observing the negative and neutral comments the product service improvement can be carried out. When the product receives high negative comments, the product must be improved precisely. This helps the company to go on with the changing trends. This survey depicts an analysis having high neutral level which shows that the customers of Amazon are mostly satisfied with their products and services [12].

3.2. Analysis of Google

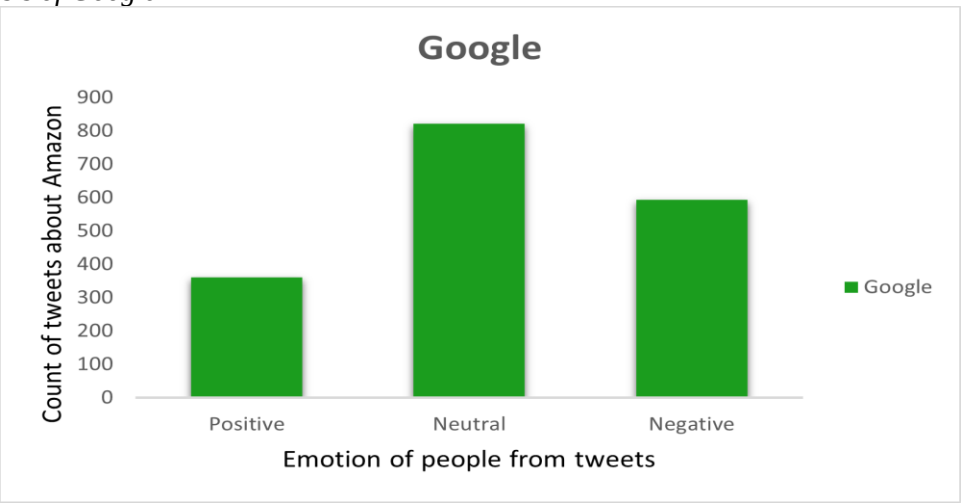

Figure 3. Analysis of Google Tweets.

Figure 3 shows the number of comments tweeted positively, negatively and neutral about Google. This analysis helps to know the satisfaction of Google's service [13]. The product and service of Google are widespread in the ocean of websites. Google and its services are undoubtedly used every day by everyone around this wide world. Here, the service provided by Google has high neutral tweet comments which depicts that the customers of Google are mostly satisfied with their products and services.

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3.3. Analysis of Google

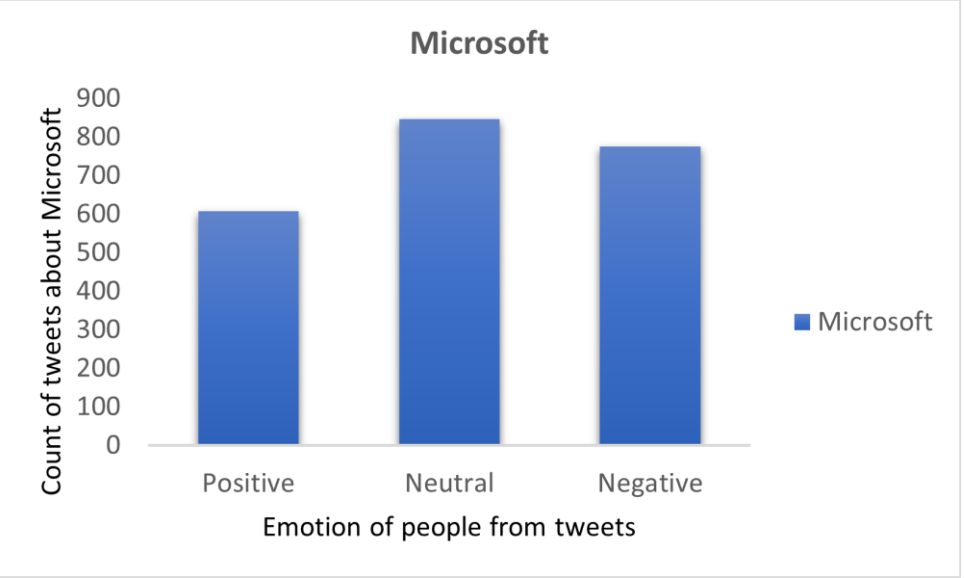

Figure 4. Analysis of Microsoft.

Figure 4 shows the number of comments tweeted positively, negatively and neutral on twitter about Microsoft. This analysis helps in knowing how much people are satisfied with the Microsoft services. This analysis shows that the neutral comments are just slightly higher than the negative comments. So, it is concluded that the services of Microsoft satisfy the customers, yet it needs some improvement.

4. Conclusion

The research analyzed the tweets of three online platforms among people with the help of the tweets provided by the users or customers of the platforms. Here the analysis shows that most of the people are satisfied with the products and services provided by the platforms. A very few customers are not satisfied with the service provided and hence they issued negative comments which helps the service providers to improve their service in the specified platforms [14].

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