International Journal For Technological Research In Engineering
Volume 9, Issue 10, June-2022 *ISSN (Online): 2347 - 4718*

SENTIMENT ANALYSIS AND VADER: A REVIEW

Shadab Ahmad[1], Md Shahid Anwar[2]
[1]M.Tech Scholar, [2]Assistant Professor
Department of Computer Science and Engineering
K. K. University Nalanda (Bihar)

Abstract: A sentiment analysis is a type of NLP that determines if data falls under any of the three categories: positive, negative, or neutral. This can be used in customer feedback to understand customer needs and monitor brand sentiment. The VADER tool is a lexicon and rule-based sentiment analysis which is specifically attuned to sentiments expressed in social media. The goal of VADER is to identify whether something expressed in text is positive or negative. This paper reviews the concept of sentiment analysis and also provides the brief overview about the VADER.

Keywords: Sentiment Analysis, Review Analysis, VADER

1. INTRODUCTION

Brands must use data to understand their markets perception of their offerings. Organizations should use data across customer feedback channels in order to see the true impact that they have on branding. Quantitative feedback like net promoter scores may only provide limited information about the performance of a brand but qualitative answers such as customer reviews and comments offer more insight into how customers feel about your brand. [1]

It's impossible to find all the data requested through manual processes as automated processes can help with finding brand sentiment through text. Sifting through this data is time-consuming for humans and technology can help sift through that text of unsolicited feedback to find information on brand sentiment. [1]

Sentiment analysis is the process of detecting positive or negative sentiment in text. It can be used by businesses to detect sentiment in social data, gauge brand reputation, and understand how customers feel about a company. [1]
Sentiment analysis is the process of organizing text and classifying whether it's positive/negative or neutral. Sentiment analysis is contextual mining of words which helps businesses determine whether the product they're manufacturing will be in demand or not. [1]

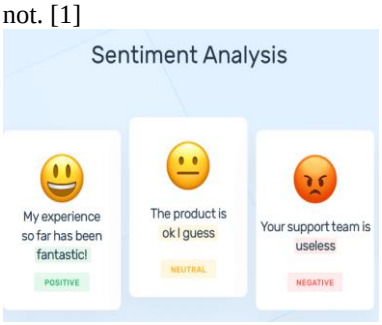

Fig 1. Sentiment Analysis

Sentiment analysis is a useful tool to help you understand the public opinion of your brand. It does this by identifying and extracting subjective information from social media posts. Analysis of social media streams is usually restricted to just basic sentiment analysis, but if you use more sophisticated methods on these streams, you will discover count-based metrics. [2]

Sentiment analysis is all about recognizing people's opinions, and helping the companies to make their product or service more appealing for the customer. Sentiment analysis is not just about polarity (positive, negative), but also emotions (happy, sad, etc.). Some of the algorithms used in sentiment analysis are Rule-based and Automatic. [2]

2. TYPES OF SENTIMENT ANALYSIS

The following are some types of sentiment analysis which are observed on general basis.

- Fine-Grained: With sentiment analysis, you can study reviews and ratings with the precision of polarity. The sentiment analysis uses categories like very positive, positive, neutral, negative, or very negative to identify potential sentiments in a review. For a rating scale, 1 is very negative and 5 is very positive. For a rating scale, 1-2 is very negative and 9-10 is very positive. [3]

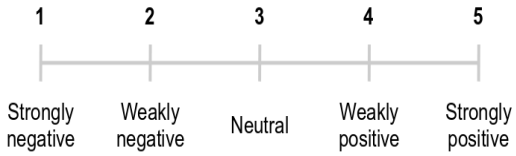

Fig 2. Fine Grained Sentiment Analysis

- Aspect-Based: Fine-grained analysis helps you determine the overall polarity of your customer reviews, but aspect-based analysis dives deeper. If a customer tells us that the camera struggles in artificial lighting, the camera struggles in artificial lighting. The reviewer commented on something "negative" about the camera. This can be done using Aspect-Based Sentiment Analysis. [3]

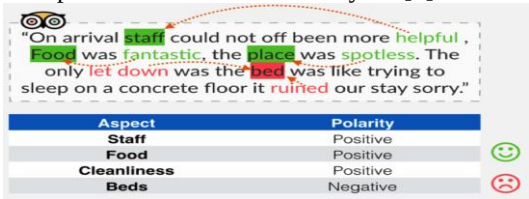

Fig 3. Aspect Level Sentiment Analysis

- Emotion Detection: Emotion detection helps you express emotion, such as anger, sadness, happiness, frustration, fear, worry and panic. This is typically done through lexicons – a collection of words that convey certain emotions – or advanced machine learning algorithms to detect with greater accuracy. You should use ML over lexicons because people express emotions in disparate ways. For instance, "This product is about to kill me." This line could convey feelings of fear and panic. This phrase has a different and positive meaning, but it might not be detected because it sounds like "kill" means "fear" in this context. [4]

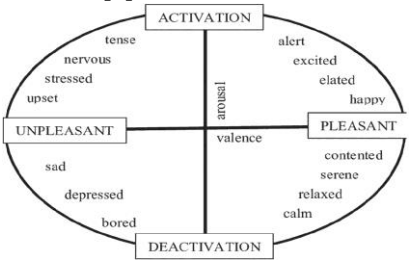

Fig 4. Emotion Detection Sentiment Analysis

- Intent Analysis: When businesses can accurately understand their consumers' intent with machines, they can save time, money and effort. With a machine's ability to read and process data faster than a human, companies can find the leads that customers who want to buy at a certain time or are in need of your product. Intent analysis informs the company and empowers them to provide the customer with what they want. There is a divide between potential customers who might not be ready to buy, and those that are willing to purchase. It's helpful for your business goals to have knowledge of when each person might be ready for purchase. Then you can choose to target said customer with advertisements in order to increase the chance of converting them into a customer. [4]

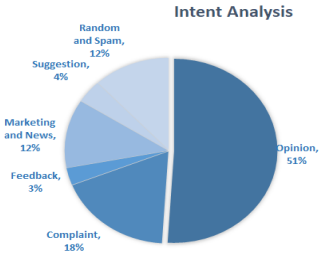

Fig 5. Intent Analysis

3. USES OF SENTIMENT ANALYSIS

- Monitoring Social media: Social media posts can give valuable honest feedback about your products, services, and businesses. Sentiment analysis software can analyze social data in minutes to detect emotions and check sentiment on every platform. It can work out if it's sarcasm or read common acronyms. [5]
- Customer Support: Customer support is a time-consuming task as a high number of requests, varied topics, and the urgency can skew priorities. Sentiment analysis has the ability to read for human language for meaning and tone of voice, like a human would in order to prioritize urgent issues. [5]
- Brand monitoring: Brand monitoring is one of the most popular applications of sentiment analysis in business. If you are constantly monitoring your brand on social media platforms, then you will be notified about bad reviews as soon as they happen. This can prevent your brand from being damaged in the long run, and allow you to fix any issues immediately. One of its benefits is that it tracks your brand data over time. By monitoring content about your company on blogs, forums and social media, you can create data from information and statistics. [6]
- Understanding your Customer: Combining all of your customer feedback on the web, chats, call centers, and emails through sentiment analytics allows you to categorize and identify patterns in the data. Listening to your customers, and learning what they want, will help you create a personalized customer experience. Not all customers are created equal and the more information you have on them the better. [6]
- Better Understanding Employees: By analyzing sentiment, you will know how to better engage employees and reduce turnover. If you want to know whether people think your employee survey was good or bad, sentiment analysis can quickly tell you. Use unstructured data to help you find what employees care about most. Give them the choice to focus your by creating a human-like voice in the content they share online. [7]
- Product analysis: Find public feedback about your product after launch or analyze years of data you may have never seen. You can search keywords for a particular feature and find only the information you need through aspects-based sentiment analysis. Sentiment analysis will show you how your target audience reacts to your product, what need to be improved, and what will make them happy. [7]
- Market and competitor research: Use sentiment analysis to research your competitors and the market. Find out what people are saying about your competitors, as well as how you're doing in marketing compared to them. Speak to you customers in positive language, using the same wording your competitors have. [8]

4. SENTIMENT ANALYSIS USING VADER

VADER is a sentiment analysis that is sensitive to both polarity and intensity of emotion. Texts are analyzed with VADER before they are attached to a sentiment label. VADER is a lexicon and rule-based instrument that analyzes the feelings expressed in web content. VADER uses a mix of lexical highlights, with most designating the direction of the feeling expressed as positive or negative. [8]

VADER relies on a sentiment score for each word, with words having fewer positive sentiments associated to negative numbers and more positive sentiments associated to positive numbers. The sentiment scores can be summed up to give the overall sentiment towards the sentence. For example, words like 'love' and 'enjoy' in the context of "did not love" carry a

negative sentiment. VADER takes into consideration the context behind these words as well, such as emphasizing a word with capitalization and punctuation to express emotion. [9]

Step of Analysis using VADER:

- A model trained on long text may not be effective for shorter texts. Make sure to use the appropriate model when analyzing a text, depending on its length. [9]
- To continue, select the type of analysis you want to perform. To analyze sentence-length texts, we are going to use an NLTK lexicon called VADER which has been trained in sentiment analysis. [10]

VADER can understand the sentiment of different messages and can extract meaningful pieces from it, such as emoticons, conjunctions, sentences, and more. VADER performs sentiment analysis very well and it is easy to use. It consists of a ready-made model which can be used across multiple domains, social media texts, reviewing, etc. The cherry on the cake with VADER is that you don't need any training data for it to work. [10]

5. CONCLUSION

Sentiment analysis is a marketing tool to track customers emotions and aid in understanding the success of advertisements or promotions. Sentiment analysis tools are essential to detect and understand customer feelings. Companies use these tools to enhance customer experience, improve customer service, and understand how customers feel.

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