



Sentiment Analysis – An Overview of a Technique Which Can Be Used In Marketing Activities

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ABSTRACT

A sentiment analysis, a form of artificial intelligence, is a technique which uses natural language processing (NLP) to ascertain the opinions and emotional tone of the user written content on the online platform. It can be used in any form ranging from determining the sentiments of consumer’s reviews, employee’s feedback, and their social presence for effective marketing of their products and services. Through this article we wish to analyse the existing literature in sentiment analysis field to ascertain its usefulness in the marketing activities.

Key words: *sentiment analysis, sentiment tool, customer’s sentiment analysis, natural language processing tool*

OBJECTIVE

The objective of the study is to do an exploratory research on the sentiment analysis, a tool which can be used in increasing the sales of the company by ascertaining the sentiments in the feedback and opinion of its consumers. We are interested in exploring the advantages, challenges, case studies of the companies which have successfully adopted it as well as the existing researches in this area.

INTRODUCTION

Sentiment analysis (Basant et al., 2015) is a technique which uses the natural language processing (NLP), text examination and computational tools to automate the extraction as well as classification of sentiments from the reviews involving human sentiments. It is a popular research area in NLP, which aims to recognise the person’s opinions and attitudes as per polarity (Tawunrat & Jeremy, 2015). Sentiment analysis helps the companies to do the opinion and survey research of a large data set in a fast and reliable manner as compared to the alternative traditional research methods (which involves manual efforts) (Matthew et al., 2015). In short, it is the process of determining the emotional tone behind a series of words, in order to ascertain the attitudes and emotions expressed by the person online.



Generally, sentiment analysis besides identifying the opinion, also extracts the attributes of the expression. For example:

- Polarity: to determine if the writer express a positive or negative opinion,
- Subject: it is the thing that is being talked about,
- Opinion holder: the person or entity that expresses the opinion

Scope: Advanced artificial intelligence techniques is an effective tool for doing in-depth research of anything and sentiment analysis is an added feature to it, which can be applied at different levels of scope:

- Document level - it analyse the sentiment of a paragraph or entire document
- Sentence level - it analyse the sentiment of a single sentence
- Sub-sentence level - it analysis the sentiment of sub-expressions within a sentence

LITERATURE REVIEW

During the late 1990s and early 2000s, the research and practical application of automated natural language processing (NLP) by computers took an interesting turn to use this technique to diverse fields (Pang & Lee, 2008). Rapid changes in computer processing power, advances in machine





learning tools, and increased attention to the role that computers could play in processing language were the main factors behind this interesting turn in the research.

During the same period, an increasing number of research scholars have studied the impact of online product reviews on the company's sales and marketing strategies (Yubo Chen & Jinhong Xie, 2008, Chevalier & Mayzlin, 2006, Chena, Fay & Wang, 2011). There was almost no computational study on the customer's opinions before the internet as there was little opinionated text available in the public domain. In the past, when an individual needed to make a decision, he or she has to consult their friends, families, colleagues or economic agents. With the evolution of internet, the consumer can simply go through the content written on social blogs, company websites or e-commerce middlemen (like amazon, Flipkart) and can decide whether he or she should buy the product or service. In today's world the consumer has multiple sources to validate their decision making process, for example, content written on the websites, blogs, forums, online portals, social networks, reviews, opinions, recommendations, ratings, and feedback. The companies have to manage and analyse these written contents for their own benefit so that improvements can be made by ascertaining whether the content written for them is positive or negative. Many new applications have been emerged in this filed which included automated or assisted dictation and transcription, and more intelligent user interfaces ranging from mobile help menus to the computer interfaces that eventually evolved into today's Siri, Cortana and Alexa.

With the growing exploration of sentiment analysis in the field of computer science, many researches started testing the usefulness of sentiment analysis in the management activities and evidenced that the use of sentiment analysis helps in providing valuable information to the marketers. Automated opinion mining and summarization systems are today's companies requirements, as mental limitations like subjective biases can be overcome with an objective sentiment analysis system (Liu and Zhang 2012). Opinions and sentiment analysis provide valuable information for placing advertisement on web pages, i.e. about their location, gender, date, polarity, etc. (Unman et al, 2017). Sentiment analysis helps in evaluating the effectiveness of social media posts and highlighted the importance of considering the opinion of the masses for better understanding of consumer feedback (Flora et al, 2018). The positive and negative consumers' sentiments to some extent are

associated with the post popularity of the brand (Hamid et al, 2017). We have also come across various technical case studies on how to do sentiment analysis on Twitter and Facebook data (Alec et al, 2009; Pak and Paroubek 2010; Agarwa et al, 2011; Nakov et al, 2016) for the benefit of marketing decisions. As it is true for any other tool, Sentiment analysis also suffers various weaknesses and challenges in terms of accuracy of the language processing results. Many researchers have worked in this area to find out the weaknesses and challenges associated with the use of sentiment analysis and how it can effectively managed. If sentiment analysis is not used carefully, the results from sentiment analysis can be meaningless or even misleading (Tao Ding and Shimei Pan., 2016).

ADVANTAGES

- **To adjust marketing strategy:** Social media is a platform where the consumers of the companies share their experiences. The company can use the sentiment analysis on its customer's reviews and feedbacks to get to know the full idea about how its brand is being perceived by their target customers. They can use this information to provide them with means to optimize their marketing strategy.
- **To measure rate of return of company's marketing campaign:** Every company wants to analyse the qualitative dimensions i.e. how much positive or negative discussions have happened amongst their target consumers in addition to the quantitative dimensions like increase in the number of followers on social media. After combining the quantitative and the qualitative measurements, company can measure the true return of their marketing campaign.
- **To enhance the product quality:** Sentiment analysis helps companies in analysing the expectations of its target consumers in terms of quality, features and taste. Post that the company can align its products and services as per their tastes and preferences.
- **To improve customer service:** There are various underlying factors that together contributes to a great customer service, like on-time delivery, active in handling consumer grievances, as well as adequate compensation for any defaults and errors. Sentiment analysis helps the companies by giving real-time alerts of a negative discussions so that company can handle them quickly. If the company reacts to the customer's complain faster, there are high chances that consumer will overlook about being irritated in the first place, and be satisfied with the great customer service.



- **For effective crisis management:** There are various situations which can watershed the image of the company, like product's bad quality, bad customer service, hazardous product, or other serious social issues like environmental harm, animal cruelty or child labour usage in emerging markets. If the company don't do social listening through sentiment analysis, the conversation can go viral and lead to a huge crisis which at times might not be able to cope back from.
For example, in January 2017, a #DeleteUber campaign went viral on social media. The reason of this campaign was that the Uber turned off airport surge pricing in New York city when taxi drivers were protesting against travel ban by President Trump, which lead to accusations of strikebreaking on Uber.
- **For effective lead generation:** As true in reality, loyal and happy customers tells about their product experiences to 3 people but unhappy and unsatisfied consumer will complain to about 30 people. So, lead generation by unhappy consumer is faster as compared to the happy consumer. As sentiment analysis can help the companies in ascertaining their target audience's needs, wants and desires about something, company can devote itself for creative ideas to produce those products which can satisfy those needs of new customers and satisfy the unhappy consumers.
- **To increase revenue:** The ultimate advantage accrues as a result of doing sentiment analysis is increased sales revenue. The increase in sales revenue is the result of successful marketing campaigns, improved products quality, and better customer services, all of them can be achieved with sentiment analysis.

CHALLENGES

- **In case of sarcastic text** – sometimes people express their negative sentiments using positive words. As it is hard for the human, it is much harder for a machine to understand. It is very difficult (if not possible) to train a machine to catch the proper meaning of the sarcastic text.
For example:
'This laptop has an awesome battery back-up of 32 hours' (Non-sarcastic)
'This laptop has an awesome battery back-up of 2 hours' (Sarcastic)
- **In case of negation detection** - In linguistics, negation is a way of reversing the polarity of words, phrases, and even sentences. Researchers have to use different linguistic

rules to identify its occurrence, and also to determine the range of the words that are affected by negation words. There is no limit on the scope of affected words.

For example:

In the sentence 'The movie was not good', the scope is only the next word after the negation word 'not'. But in case sentence is like "I do not call this movie a comedy film," the effect is until the end of the sentence. The original meaning of the words changes if a positive or negative word falls inside the scope of negation, and in that case, opposite polarity will be reverted.

- **In case of word ambiguity** - The major problem with word ambiguity is that it is not possible to define polarity in advance since the polarity for some words is highly dependent on the sentence context.

For example:

'The movie was unpredictable'

'The steering wheel was unpredictable'

In the first example, the word polarity of 'unpredictable' is predicted as positive, while in the second, the same word's polarity is negative.

- **In case of multipolarity** – In cases of sentences which exhibit multipolarity, the total meaning of the sentence can be misleading, as how an average can sometimes fleece valuable information about all the numbers that are included into it.

For example:

The audio quality of my new phone is so awesome but the display colours are not too great. Some sentiment analysis models assign a negative or a neutral polarity to this sentence. But in order to truly analyse such situations, a sentiment analysis model must assign a polarity to each aspect in the sentence, like here, 'audio' is an aspect assigned a positive polarity and 'display' is a separate aspect with a negative polarity.

- Another significant issue which might going to impact the use and adoption of sentiment analysis technique in India is the **major gap between the demand and supply of engineers who have experience in machine learning**. Various studies have been conducted in this area, few of them are listed below:

a) **A study conducted by Analytics India Magazine** reveals that there are more than 78,000 jobs in the Data Science and Machine Learning lying vacant in India. The number of jobs for both these professionals is rapidly growing with the



number of job postings for Data Scientist being at an all-time high in 2017

- b) The **National Association of Software and Services Companies (Nasscom)** is the apex body representing the country's IT and business process management (BPM) industry. They have reported that the demand-supply gap for skills affected the industry's performance in 2018, due to shortage of 140,000 skilled techies for 500,000 jobs in the sector. In future, the industry will face a shortage of 230,000 skilled techies as jobs in Artificial Intelligence and Big Data are estimated to be 780,000 by 2021.
- c) **Salary Benchmark 2019 report** stated that Big Data, machine learning and data science will drive top job opportunities in 2019. Strong hiring activity is expected to continue, given an increased demand for senior Indian executives equipped with business and stakeholder management experience.

CASE STUDIES OF COMPANIES

We have also found out many case studies of companies who have successfully adopted sentiment analysis, and have stated that it has helped in improving their products and services, with their brand development and in increasing its revenue and profitability. Few of them are listed down in brief below (Rob Petersen, 2017):

- **Barclay:** They launched a mobile banking application called Pingit in 2012. Soon after the launch, Barclays conducted the sentiment analysis on customer's feedbacks which revealed that some online mention of its app were negative. The main reason behind the negative reviews is that many users were unhappy that the app didn't work for under 18 years of age. Teenagers were not the only segment who were unhappy but also the parents since they couldn't transfer the money to them. Within the week, Barclays reacted to it and gave the access to 16 and 17 year-olds to the app, showing that business can earn lot of reputation through quick responsiveness to customer feedback.
- **Cisco:** Cisco is an active social listeners and they always track ongoing topics, trends, and sentiment to support short-term listening goals such as a launching of a new business initiative. They have reported that due to active sentiment analysis they got more close to their customers and can focus on how to monitor, handle, and triage conversations. They have

disclosed that they have achieved 281% ROI only through social listening.

- **Dell:** Dell had made an online community called IdeaStorm, where they invite their customers to participate and share ideas about product improvements they would like to see in their desired products. They have reported that as a result of this drive they have received about 550 different ideas from this community that have been successfully implemented in Dell products.
- **H&M:** H&M have reported that they ran four major campaigns that each featured difference celebrity spokesperson. By using the sentiment analysis they measure the quantum of conversation following the campaigns. H&M witnessed that the success of their endorsements depended on their geographical markets. The result of analysis showed that how different cultures and customs can affect the perception of an audience that receives their marketing campaigns.
- **HP:** Hewlett-Packard, an IT company, created their own online magazine, Hpmatters.com, where customers could read the content once a month. This initiative taken by HP was a result of their customer's feedback that they don't want or need to hear from HP every day. Rather, they wanted their content all at once in condensed and concise form. HP embrace the power of social listening and reported that it has benefited their marketing strategy.
- **Pizza Hut:** Pizza Hut, a restaurant chain and international franchise, have adopted social media monitoring to turn their marketing strategies more effective. For example, they posted two very alike posts, both shots of pizza, one was on a white background, the other on black. As a result of the sentiment analysis of the conversation around the posts, they witnessed that the black background shot was performing three times better as compared to the white background. This boosted the ROI of their ads by using that image.

CONCLUSION

Sentiment analysis is a new technique which has wider prospects in management area, and many researchers have conducted the research in this dimension and has confirmed that its use can benefit the company in many ways. Many companies have witnessed its significant contribution and have reported that sentiment analysis helped them to improve their marketing campaign and revenues. Huge volume of Twitter and Facebook data is available for the companies at free of cost which they use to conduct the opinion analysis and can get benefit out of it.

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