Artificial Intelligence in Marketing Social Media Sentiment Analysis

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Abstract

Social media refers to the development and sharing of sentiment, information, and interests, as well as other forms of opinion via virtual communities and networks. Nowadays, social networking and micro blogging websites are considered reliable sources of information since users may openly express their opinions in these forums. An investigation of the sentiment on social media could assist decision-makers in learning how consumers feel about their services, products, or policies. Extracting emotion from social media messages is a difficult task due to the difficulty of Natural Language Processing (NLP). These messages frequently use a combination of graphics, emoticons, text, etc. to convey the sentiment or opinion of the general people. A classification issue arises when categorizing the sentiment of eWOM as positive, negative, or neutral. We could not use standard NLP tools to examine social media sentiment. In this chapter, we will study the role of Artificial Intelligence in identifying the sentiment polarity of social media. We will apply ML(Machine Learning) methods to resolve this classification issue without diving into the difficulty of eWOM parsing.

Keynotes: Social Media Analytics, Sentiment Analysis, Artificial Intelligence, Electronic Word of Mouth, Machine Learning.

Introduction

Social media has become a major breakthrough in modern communication, shaping public opinion andbuilding relationships, and providing a simple and important platform for businesses to engage with customers. The integration of artificial intelligence into analytics has significantly improved the ability of businesses to understand and improve the customer journey, providing personalized experiences for customers through data-driven insights.

However, the use of AI in such an environment raises ethical concerns such as privacy violations, potential for bias in algorithmic decisions, and manipulation of user behaviour (Jung et al., 2021).

Therefore, automated methods calculate sentiment polarization based on the sum of positive and negative comments once an event is mentioned. The field of social media analytics has grown rapidly in this to answer the question 'What do people think about a particular event or topic?' For example, analysingpeople's feelings, opinions and emotions has also gained its importance. !!' is a combination of words and emojis that indicate a positive feeling about Sunday. Such eWOM is very difficult to parse. Interpreting the context of sentences is not an easy task until these messages are translated into plain text while retaining their context and emotion.

Reviewof Literature

Previous bibliographic indexes or review studies have shed light on the growing use of AI in social media analytics, research methodologies, providing insights into emerging topics and the influence of AI in social media analytics. In this context, we found that previous reviews or bibliographic analyses have mainly focused on a specific business application of AI and social media integration, the technical interactions between AI and social media, the social implications of the confluence, and the increasing ethical implications.

The first review group mainly focused on reviewing specific business applications of AISoMe. Varsha and colleagues conducted a review on the use of artificial intelligence in branding and marketing through social media in 2021. Chen et al. examined how AI can be used for social media event detection. They emphasized the capabilities of artificial intelligence, such as natural language processing and machine learning, in recognizing and studying current events.

The first review focused on the technical interactions between AI and machine learning algorithms and analytical models designed for social media analysis. Balaji et al. used natural language processing to demonstrate the flexibility and effectiveness of machine learning algorithms in handling the nuances of social media information. They also conducted an in-depth review of AI methods for analysing social media, such as machine learning and deep learning.

Beckman and Bowker examined machine learning algorithms used in social media analysis, emphasizing the capabilities of unsupervised and semi-supervised learning methods to process unstructured data.

The third review focused on exploring the social implications of AISoMe analyses. Babu et al. (2022) examined the use of AI in detecting internal health issues in social media, emphasizing the ability of AI methods to respect original indicators of internal health issues. Fernandez-Luc and Imran examined the use of social media analytics for humanitarian purposes, such as disaster response.

The authors found that social media analytics can provide valuable insights into the needs of affected populations.Other reviews have focused on the ethical and social aspects of AISoMe analytics. Islam et al. reviewed the use of AI in detecting misinformation and hate speech on social media, emphasizing the potential of AI methods to improve online safety and combat harmful content.

Gangurde et al. (2022) examined the use of AI in detecting and reducing online harassment. In contrast, Hisa and Altosari identified ethical concerns surrounding AI in social media analytics, such as isolation, bias, andtransparency.

This macro-level perspective allows us to identify not only dominant themes, but also emerging trends and potential synergies that are not apparent when focusing on isolation in specific applications or dimensions. Our qualitative analysis will further complement this holistic view by providing a deeper understanding of the key arguments and contexts within each theme. This dual approach enables us to bridge literature gaps between different research groups and provide a comprehensive and integrated understanding of the AISoMe landscape.

Social Sentiment Analysis System

After extracting plain textbook from social media messages, we can use computer algorithms to automatically classify the sentiment polarity.

Lexicon based: this method uses apre-built storage of emotional words to match the dispatch. They depend on lexical resources similar as lexicon, word banks, or ontology.

AI- predicated: AI- predicated approaches use ML methods to identify the sentiment. The subjectivity, polarity, or object of any opinion is frequently determined by a lexicon- based system

using a set of criteria created by people.These rules may take into account a variety of NLP styles developed in computational linguistics, like part- of- speech tagging, tokenization, stemming, and parsing.

Contrary to lexicon- based systems, AI- based methods are on the basis of ML algorithms instead of hand- crafted rules.Typically, the process of identifying the polarity of sentiment is defined as a classification problem, in which a classifier is provided a textbook and outputs a polarity label, like positive, negative, or neutral.

Lexicon- based systems don't perform well due to thenon-standard language of social media addicts.It's a promising strategy that has been widely used in AI disciplines including NLP, semantic parsing, transfer learning, computer vision, and many others.

- People don't have a formal writing style.
- People use a blend of textbook, emojis, abbreviations, images, and symbols.
- Millions of messages are generated every second.

Sentiment Classification Using Machine Learning

The task of identifying sentiment polarization is generally defined as a set of problems, which, when classified and fed into a textbook, produce a label such as "positive, negative, or neutral".

In general, both supervised and unsupervised learning techniques can be used to classify textbooks using machine learning. Many tags and technical terms are used in supervised approaches. When it is challenging to find these labelled training documents, unsupervised approaches are used.

Since there are thousands of messages published on social media every blink of an eye, we can manually label several thousand of them and use them for supervised learning. That is, a training data set with three levels of positive, negative, and neutral is prepared by selecting messages from social media platforms such as Twitter and Facebook.

Only the training documents are those that are most comparable to the incoming document. They are only used by the machine learning algorithm to label it. Popular textbook bracketing algorithms include K-Nearest Neighbour (KNN). With the help of supervised learning, methods like this one group objects into a predefined category. Then we will see how KNN can be used to classify sentiment polarization.

Applications of Social Media Sentiment Analysis

Traditional polling can be replaced by AI-based social media analysis, which greatly helps decision makers understand the situation and address any emerging crises. Social media is used by the public to express their feelings and opinions. People post millions of messages on social media every blink of an eye. However, it can be very helpful for decision makers to respond quickly to any critical situation. If these messages are analysed and the sentiment extracted, examples of sentiments picked up by an automated system from Twitter are given below (Table).

S.No	Twitter eWOM	Sentiment
1	Future generations will continue to be inspired by their sacrifice for our motherland	Positive
2	We appreciate and respect your sacrifices, and we will always be grateful for them	Positive
3	If you carry your childhood with you, you never become older	Positive
4	The government has officially proclaimed that India is currently under a state of emergency as a result of attacks on farmers	Negative
5	A paranoid, vindictive administration wont let farmers survive	Negative

Sentiment Bracketing by Automated System

The results of the experiment are convincing. Therefore, the results show promising results. And can also be used by online marketing companies and government agencies for decision-making. Online publishing companies can use this study for effectively targeted marketing campaigns. On the other hand, they can learn how the public is affected by a policy decision of government agencies. So they can also determine how to respond to public opinion.Social media analytics shows us the areas where its applications are found.

Real-world applications of social media analytics.

It can determine how consumers feel about their brands and products, and how they feel about advertising efforts. Generally, it allows businesses. Social media analytics helps businesses in many different areas.

- Namely getting customer perceptions of products and services.
- Understanding conversations - what is being said; how it is being allowed.
- It is about identifying trends related to brands and service offerings,
- Identifying the high-value elements of a service or product,
- Assessing the response to messaging on social media and other channels,
- Identifying what the competition is saying and its effectiveness.
- You also need to know how third-party partners and channels can impact performance

Conclusion

AI gives better results when classifying eWOM sentiments based on polarization. There are two processes. Namely, Feature Extractor and Machine Learning. It removes the major difficulties in using NLP tools to understand social media communications. Moreover, businesses can gain more insights by using a centralized sentiment analysis system to identify the accuracy of customers' comments and complaints. Some of the common benefits of AI-based sentiment analysis include:

Sorting data at scale: Thousands of tweets, customer service discussions; manually reviewing survey responses is very difficult because it is very time-consuming. Therefore, AI-based sentiment analysis helps businesses analyze large amounts of data economically and efficiently.

Real-time analysis: Businesses can use social media analysis to immediately detect risky situations in real-time and take action before consumers start to leave. They can be divided into two categories: those that increase the intensity of sentiment (very, very) and those that reduce it (slightly). Through a rule-based method, the AI-based model can be further improved to determine the level of emotional intensity.

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