Extracting Opinion Relations from Online Reviews Using Machine Learning

Ms. Ashwini Gavade, Mr.Samyak Bagde, Mr.Ashish Sabne, Ms. Nisha Sonawane, Ms.Akshata Bagul

Department of Information Technology

Sinhgad Institute of Technology and Science, Pune, India

Abstract: *Online shopping is an everyday practise nowadays for purchasing requirements. These online retailers provide multiple benefits, including doorstep delivery. We don't need to worry about where to discover the goods because they also offer reviews and ratings of the product, which are quite helpful for getting product information. Usually, systems of rating co-extract opinion targets (OT) and words (OW) from an extensive amount of product reviews.The system's accuracy is difficult; thus, a partial supervised word alignment model has been implemented to enhance the accuracy and identify connections among opinions. But because consumers have different opinions and reviewers write their reviews based on their areas of interest, we cannot tell whether a product is good or bad by reading just one or two customer reviews.As a result, we recommended utilising Nave Bayes and Neural Network (NN) for classification and sentiment analysis in online product evaluations. Opinion analysis is often employed for extracting views from large amounts of text. We contrast naive bayes and NN machine learning approaches for evaluating assessments that are neutral, good, and negative.*

Keywords: Opinion mining, Opinion target extraction, Opinion word extraction, Naïve bayes, Neural network.

I. INTRODUCTION

The Opinion examination is generally connected to the voice of the client materials, for instance, audits and overview reactions, on the web and online life, and social insurance materials for applications that extend from showcasing to client administration to clinical prescription. A basic errand in estimation examination is describing the limit of a given content at the report, sentence, or highlight/viewpoint level— regardless of whether the communicated opinion in a record, a sentence or an element include/angle is certain, negative, or unbiased. Progressed, "past furthest point" feeling request looks, for example, at enthusiastic states, for instance, "furious", "dismal", and"upbeat". Antecedents to nostalgic examination incorporate the General Inquirer, which gave bits of knowledge toward assessing designs in content and, independently, mental research thatinspected an individual's psychological state dependent on the examination of their verbal conduct. Along these lines, the technique depicted in a patent by VolcaniandFogeltookaganderatassessmentand recognized individual words and expressions in the content regarding diverse passionatescales.A present framework dependent on their work, called Effect Check, presents proportional words that can be utilized to increment or decline the dimension of evoked feeling in each scalecertain, negative or fair.Generally, customers want to discover fine- grained estimations around a perspective or feature of a thing that is surveyed. For example: "This Television has a brilliant and unbelievable, nevertheless, its LCD objectives is very impressive."

II. RELEVANCE

The text is highly relevant for a project on extracting opinion relations from online reviews using machine learning. It discusses the fundamental task of sentiment analysis and the challenges involved in determining whether the expressed opinion in a document, sentence, or feature/aspect is positive, negative, or neutral. Additionally, it introduces more advanced sentiment analysis techniques that examine emotional states, which could be helpful for projects that aim to extract more nuanced opinions from online reviews. The text also discusses the background of sentiment analysis, which could be relevant for projects that explore the history and development of this field.

III. MOTIVATION

For The motivation for a project on extracting opinion relations from online reviews using machine learning could stem from various factors. One of the key reasons could be the need to understand customers' opinions and sentiments about a particular product or service. By analyzing online reviews, businesses can gain insights into their customers' preferences, pain points, and overall satisfaction levels. These insights can then be used to improve their products or services and enhance customer experience.Another motivation for this project could be the need to automate the process of analyzing online reviews. Manually analyzing a large number of reviews can be time-consuming and labor-intensive. and reliability of sentiment analysis.

IV. LITRATURE SURVEY

In [1],survey on the sentiment analysis & opinion mining is a comprehensive paper that provides an in-depth overview of the field. The paper covers various techniques for text classification, feature selection, and sentiment analysis. The authors provide a detailed analysis of each technique and discuss their strengths and weaknesses.The survey paper also discusses the challenges faced by researchers in sentiment analysis and opinion mining. The authors examine the limitations of current techniques and propose future directions for the field. They highlight the need for more accurate and nuanced sentiment analysis tools that can handle complex and diverse datasets.The paper includes a detailed review of the literature on sentiment analysis and opinion mining. The authors analyze a wide range of research studies and provide an overview of the key findings in the field. They also identify gaps in the literature and propose areas for future research.Overall, this literature survey provides a comprehensive overview of sentiment analysis and opinion mining. It is a valuable resource for researchers and practitioners in the field, as well as anyone interested in understanding the latest developments and challenges in sentiment analysis and opinion mining.

In [2], Sentiment analysis and opinion mining have emerged as important areas of research in natural language processing (NLP) and machine learning. These techniques are used to automatically citation subjective information from text data, like social media posts, online reviews, and the news articles. The insights gained from sentiment analysis can help organizations to understand customer preferences, identify emerging trends, and improve their products or services.This survey paper provides a comprehensive overview of the various approaches to sentiment analysis and opinion mining. It covers both traditional lexicon-based methods and more recent machine learning and deep learning techniques. The paper also discusses challenges and limitations of these approaches, such as the difficulty of handling sarcasm and irony in text.In addition to discussing methods and techniques, the paper also covers applications of sentiment analysis, such as in marketing, politics, and health care. It also discusses future research directions in the field, such as improving the accuracy of sentiment analysis for non-English languages and developing techniques for multi-modal sentiment analysis.Overall, this survey paper is a valuable resource for researchers and practitioners in the field of sentiment analysis and opinion mining, providing a comprehensive overview of the field, its methods, applications, and future directions.

In [3], Sentiment analysis and opinion mining have gained significant attention in recent years due to the increasing amount of data available on the web. This survey paper aims to provide an overview of the different methods used for sentiment analysis and opinion mining. The survey paper covers various techniques for sentiment classification, including lexicon-based methods, machine learning techniques, and deep learning models. It also discusses the importance of feature extraction and how it can influence the accuracy of sentiment analysis.In addition to sentiment classification, the paper also covers aspect-based sentiment analysis, which involves identifying the specific aspects of a product or service that customers are expressing sentiment towards. The paper discusses various approaches to aspect-based sentiment analysis, including rule-based methods and machine learning techniques.The paper also highlights the applications of sentiment analysis and opinion mining in different fields, such as marketing, customer service, and politics.

In [4],Opinion mining, also known as sentiment analysis, is a rapidly growing field that has gained considerable attention in recent years. This chapter provides a comprehensive overview of the various techniques used for sentiment analysis, subjectivity detection, and opinion summarization. The chapter covers lexicon-based methods, machine learning techniques, deep learning models, and hybrid approaches that combine different techniques. Additionally, the chapter discusses challenges that researchers face in the field, such as dealing with sarcasm, irony, and ambiguity in

text, and the need for improved performance on multilingual and multimodal data. Finally, the chapter concludes by highlighting future research directions in opinion mining, such as improving the interpretability of sentiment analysis models and developing techniques for capturing the evolution of opinions over time.

In [5], In this paper, the authors present a novel approach for estimating the helpfulness and economic impact of product reviews by analyzing both the text content and characteristics of the reviewers. The proposed method employs machine learning techniques for sentiment analysis, feature selection, and regression analysis to predict the effectiveness of a review as well as its probableimpression on the sales of the product. In addition, the paper provides a comprehensive review of the related literature, including previous studies on review helpfulness and economic impact estimation. The authors also highlight the limitations of existing methods and propose future research directions in the field. Overall, this paper contributes to the development of more accurate and effective methods for analyzing product reviews and understanding their impact on consumer behavior.

In [6],This review paper presents a comprehensive overview of deep learning techniques for opinion mining, with a particular focus on recurrent neural networks, convolutional neural networks, and attention-based models. The paper provides a detailed analysis of the key challenges faced in opinion mining and sentiment analysis, such as the identification of sarcasm, irony, and figurative language, and discusses how deep learning methods can help address these challenges.The paper also offers insights into the current state of the art in deep learning-based sentiment analysis and examines their potential in various applications, including customer reviews, social media, and political discourse analysis. Furthermore, the paper discusses the limitations and future research directions in the field, such as the development of more interpretable and explainable deep learning models, and the incorporation of external knowledge sources to improve model performance.In addition, the paper provides a comprehensive review of related work in the field of deep learning-based sentiment analysis and opinion mining, highlighting the strengthsand limitations of various approaches. Overall, this review paper is a valuable resource for researchers and practitioners interested in the application of deep learning techniques in sentiment analysis and opinion mining.

In [7],This comprehensive review paper provides an in-depth analysis of sentiment analysis of social media, exploring a wide range of techniques for sentiment classification, feature extraction, and opinion mining. The paper provides insights into the unique challenges posed by social media data, such as the use of informal language, sarcasm, and emoticons, and discusses how different techniques have been developed to handle these challenges. Additionally, the paper reviews recent advances in the field, including the use of deep learning models, and discusses their potential for improving sentiment analysis accuracy. The paper also examines the applications of sentiment analysis in social media, including political analysis, marketing, and public opinion polling. Finally, the paper highlights some of the key research directions in the field, such as the integration of user context and the development of more robust techniques for cross-lingual sentiment analysis.

In [8],This paper presents a novel method for sentiment analysis of product reviews that combines the strengths of lexicon-based and machine learning approaches. The proposed method utilizes a sentiment lexicon to extract sentiment features and a support vector machine classifier to classify the reviews into positive, negative, or neutral sentiment categories. The paper provides a comprehensive literature review of related work in the field of sentiment analysis and opinion mining, including various techniques for text classification and feature extraction. The literature review also discusses the limitations of existing methods and their potential impact on the accuracy of sentiment analysis. Furthermore, the paper highlights the advantages of the proposed approach, such as its ability to handle different languages and the flexibility to adjust the weight of sentiment features based on their importance.The results of research conducted on tremendous quantities of data for product reviews show that the recommended approach is more effective than present-day methods.. Finally, the paper discusses the potential of the proposed approach to improve the accuracy of sentiment analysis of product reviews in various domains, such as e-commerce, healthcare, and politics.

V. FUTURE SCOPE

There are several future directions that can be explored for the project on Extracting Opinion Relations from Online Reviews Using Machine Learning. Here are some potential areas for future research:

Multi-lingual analysis: Currently, most sentiment analysis and opinion mining models are trained on English language data. However, with the increasing volume of non-English reviews and opinions online, there is a need for models that can effectively analyze sentiment in other languages.

Fine-grained sentiment analysis: While current sentiment analysis models can classify text as positive, negative, or neutral, they often lack the ability to identify more nuanced emotions. Fine-grained sentiment analysis aims to identify more specific emotions such as anger, sadness, or happiness.

Contextual analysis: Many reviews and opinions are highly dependent on the context in which they are written. Future research could explore ways to incorporate context into sentiment analysis models to improve accuracy.

Incorporation of multimedia data: Online reviews and opinions are not limited to text. Users also express their opinions through images, videos, and other multimedia content. Incorporating these types of data into sentiment analysis models could provide a more comprehensive understanding of user sentiment.

Domain-specific sentiment analysis: Sentiment analysis models trained on general data may not perform as well in specific domains such as healthcare, finance, or politics. Future research could explore ways to develop domain-specific sentiment analysis models.

VI. CONCLUSION

We reviewed a total of eight articles, their annotations and reviews were included in the literature review. We examine this gap with a statement of problems and goals, and a specific course of action is defined. The system is designed to support end users of the system.

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