

# Sentiment Analysis of Customer Product Reviews

## Classification Techniques: A Review

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**Abstract :** Today, digital reviews play a pivotal role in enhancing global communications among consumers and influencing consumer buying patterns. E-commerce giants like Amazon, Flipkart, etc. provide a platform to consumers to share their experience and provide real insights about the performance of the product to future buyers. In order to extract valuable insights from a large set of reviews, classification of reviews into positive and negative sentiment is required. Sentiment Analysis is a computational study to extract subjective information from the text. In the existing work, over 4,000,00 reviews have been classified into positive and negative sentiments using Sentiment Analysis. Out of the various classification models, we have reviewed many different classification algorithms for better classification on Amazon dataset data.

**IndexTerms - Sentiment Analysis, Amazon dataset.**

### I. INTRODUCTION

Companies are now using social media to promote their products and services. Many companies use Facebook and Twitter accounts to keep in touch with their clients. Clients also use social media to get information about products / services. In many ways, the Internet in general and social media in particular, has changed the way customers shop for goods and services. It is now quite normal for people to find the product that they want to brick-and-mortar stores and then order it online. In addition, the online consumer reviews (OCR) helped customers to learn about the strengths and weaknesses of different products and find the ones that best suit their needs. Compared to vendor-generated product descriptions, OCRs are more user-oriented and describe the product in terms of different usage scenarios and assess it from a user's perspective. Human life is filled with emotions and opinions.

Having an access to large quantities of data through internet and its transformation into a social web is no longer an issue, as there are terabytes of new information produced on the web every day that are available to any individual. Even more importantly, it has changed the way we share information. The use of social media is increasing day by day. Increasing growth of social media users over internet has also increased their participation in various discussions and activities simultaneously. In case of a product, reviews of users will help to take many important decisions about the services of the product. But manually reading such a bulk amount reviews is a very difficult task. So there is a need of a automatic system which will lead to automatically extract the positive and negative features of the product and make the decision making process easier. There are many sites and companies which perform these activities.

Sentiment analysis is a text classification problem which deals with extracting information present within the text. Opinions can be recognized as someone's linguistic expressions of emotions, beliefs, evaluations etc that is referred as sentiments. Sentiment analysis is also about finding subjectivity or objectivity of the opinion. What is subjectivity and objectivity? Subjectivity is about someone's personal review whereas objectivity is the opinion given by an expert. For example: doctor's opinion about the patient on the basis of observed symptoms comes under the objectivity. Reading huge amount of reviews and discussions over internet is not an easy task and finally to take decision. But these discussions and reviews help in many sectors such as improving e-learning environment, providing personalization in e-learning environment, for getting public response to governmental activities.

The general flow of process of sentiment analysis. From the given dataset, what we have to do is to extract the data and segment that data according to parts of speech. After that we will check the sentiments and assign tags to the extracted tokens. In the last step overall polarity of the text is calculated. If the polarity of data is positive, it is positive sentence and if polarity is negative it is negative sentence.

### II. LITERATURE SURVEY

#### i. Sentiment Analysis of Customer Product Reviews Using Machine Learning

**Authors:** Zeenia Singla, Sukhchandan Randhawa, Sushma Jain

**Publication:** 2017 International Conference on Intelligent Computing and Control (I2C2)

In this paper, to extract valuable insights from a large set of reviews, classification of reviews into positive and negative sentiment is required. Sentiment Analysis is a computational study to extract subjective information from the text. In the proposed work, over 4,000,00 reviews have been classified into positive and negative sentiments using Sentiment Analysis. Out of the various classification models, Naïve Bayes, Support Vector Machine (SVM) and Decision Tree have been employed for classification of reviews. The evaluation of models is done using 10 Fold Cross Validation.

#### ii. A Survey on Sentiment Analysis in NLP

**Author:** Divya Bohra, Sanjay Deshmukh

**Publication:** International Journal of Advanced Research in Computer and Communication Engineering (2015)

The paper, gives the overall view of sentiment analysis. It also discussed about Common Knowledge Base. Hour Glass Model was also discussed in the paper which was effectively being used for sentiment analysis. Hour glass model was being widely used for designing of intelligent opinion-mining systems which were capable of handling semantic knowledge. It made easier to detect, perceive, and feel the complete range of emotions more accurately. The review on the various sentiment analysis approaches have also been done in the paper. Also, the blend of both common and common sense knowledge bases would be a good choice as it represented the best tradeoff between common and common-sense knowledge[2].

### iii. Sentiment Analysis and Classification: A Survey

**Author:** Shailesh Kumar Yadav

**Publication:** International Journal of Advance Research in Computer Science and Management Studies (2015)

Sentiment analysis is vast research and with several challenges. It has a wide variety of applications in e-commerce. It helped in classifying, summarizing reviews and in other real time applications. The paper focused on sentiment classification, classification techniques and what tools were available for sentiment analysis. There were still some open challenges that exist in this area such as discovering of sentiment and their polarity in complex sentences, implicit aspect identification, extraction of opinion phrases and features from different corpora, extraction of multiple opinions from the same document etc. The vocabulary of natural language was very large that things become even hard [3]

### iv. Reviews on Opinions Mining and Summarization Methods for Analysis of Unstructured Textual Data for Decision Making

**Author:** Shatakshi Agrawal, Dr.Sadhna Mishra, Prof. Gaurav

**Publication:** International Journal of Advanced Research in Computer Science and Software Engineering(2015).

The paper presented an approach towards the analysis of freely expressed people's opinions as well as different existing approaches of opinion mining were summarized in the literature reviews for finding the challenges and scope that were available in the field of opinion mining & analysis for efficient decision making. The challenges and scope that were available for analysis of opinions were also stated. The proposed Opinions Mining and Summarization System were described in the paper. In the future, the work would be carried out in order to implement an efficient system that would be able to solve all or some of the challenges presented in the Opinion mining[4]

### v. a Survey on Sentiment Analysis Applied in Opinion Mining

**Author:** S. Vasantharaj, A. Martin, A. Meiappane, J. Madhusudnan

**Publication:** Journal of Network Communications and Emerging Technologies (JNCET)(2015)

The survey paper tackled a comprehensive summary about the methods and its corresponding techniques in various fields. It mainly focused on opinion mining techniques such as CBR, Supervised, Unsupervised, Machine learning techniques. It provided complete details about the data set, techniques, and its result such as positive, negative and neutral feedback for each method. The literature survey gave the complete information about the sentiment analysis with the recent research work and its task to identify the opinion mining. After analyzing, it's clear that the enhancements of SC associate degree FS algorithms square measure still an open field for analysis. Naïve Bayes and Support Vector Machines square measure the foremost frequently used algorithms for determination and drawback. They're considered a reference model wherever several planned algorithms are compared. The interest in languages apart from English during this field is growing as there's still an absence of resources and researches regarding these languages. [5]

### Summary

As the use of social media is increasing day by day, consumers react toward government actions. Total 110 million users in India use social networking sites. The analysis of consumer behavior thus become the inevitable and critical part of the overall planning and decision making functions for any organization that is helpful to match the core competencies and capabilities.

This research work will help to monitor the trade security in the country. Analysis of Amazon conversations related to reviews on purchased electronic items increases amongst Indians. This will represent a new source of information and also helps to explore the new relationships between such conversations, reviews on purchased electronic items inflation and external trends.

### III. CONCLUSION

Feeling investigation is a developing examination region in content mining and computational phonetics, and has pulled in extensive research consideration in the previous couple of years. Future look into will investigate advanced strategies for assessment and item highlight extraction, also as new characterization models that can address the arranged names property in rating surmising. Applications that use results from both assumption examination and CF are additionally anticipated that would develop sooner rather than later.

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