# Mini Project Report on

# Sentimental Analysis of Product Reviews

**Submitted in partial fulfillment of the requirement for the award of the degree of**

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE & ENGINEERING**

**Submitted by:**

**Student Name: Saumya Bagri** **University Roll No.: 2119140**

*Under the Mentorship of*

**Mr.Akash Chauhan**

**Assistant Professor**


**Department of Computer Science and Engineering**
**Graphic Era Hill University**
**Dehradun, Uttarakhand**

Graphic Era Hill University
DEHRADUN • BHIMTAL • HALDWANI

# CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the project report entitled **"Sentimental Analysis of Product Reviews"** in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science and Engineeringof the Graphic Era Hill University, Dehradun shall be carried out by myself under the mentorship of **Mr. Akash Chauhan, Assistant Professor**, Department of Computer Science and Engineering, Graphic Era Hill University, Dehradun.

**Name: Saumya Bagri** **University Roll no.:2119140**

# Table of Contents

# SENTIMENTAL ANALYSIS OF PRODUCT REVIEWS

## Chapter 1

# Introduction

### 1.1 Introduction

In today's digital era, the landscape of shopping has transformed significantly with the advent of e-commerce platforms. These platforms have revolutionized the way people shop, offering convenience, extensive product options, and competitive pricing. As a result, customer reviews have emerged as a powerful source of information for both businesses and consumers. Product reviews provide valuable insights into customer experiences, opinions, and sentiments, playing a crucial role in shaping purchasing decisions and influencing brand reputation.

The aim of this project is to develop a robust product review analysis system that leverages web scraping techniques and sentiment analysis algorithms to extract and analyze customer reviews from e-commerce websites. By harnessing the power of data, businesses can gain a deeper understanding of customer sentiments, identify strengths and weaknesses in their products, and make data-driven decisions to enhance customer satisfaction and loyalty.

## 1.2 Problem Statement

With the rise in popularity of online shopping, the volume of product reviews available on e-commerce platforms has significantly increased. It becomes challenging for businesses to manually analyze and comprehend the sentiments expressed by customers in these reviews,and for customers to pick which one is the best choice for them because mixed and abundant reviews. Therefore, an automated system is needed to collect multiple reviews and provide aggregated sentiment analysis to obtain meaningful insights.

## 1.3 Objectives of the Project

The main objectives of this project are as follows:

1.Develop a web scraping module to collect product reviews from various e-commerce platforms.

2.Perform preprocessing on the collected reviews to eliminate noise and irrelevant information.

3.Apply the VADER sentiment analysis algorithm to determine the sentiment polarity (positive, negative, or neutral) of each review.

4.Generate an overall sentiment score for the product based on the aggregated sentiment of all reviews.

## Sentiment Analysis:

Sentiment analysis also called opinion mining, it focus on retrieval of information from the text. Now computer shpuld be able to detect useful information from text. It has advantages like to collect useful information from blogs, website and through these information decision taken that either the customer is happy or not. Sentiment analysis is useful for online shopping where to find useful reviews of customer and through these reviews to decide whether customer is happy or not.

## Individual Consumers:

If a person want to purchase a product from a company and the person just go the website and instead of reading all the customer reviews and wasting time of reading the customer just to understand the product usage and usefulness through only one emotion.

## Recognition Unit:

This survey will focus on emotion recognition in a sentence. Because it is difficult to find emotions in sentence rather than the case where there is already an emotional word. It is easy to find emotions in a text documents, paragraph etc there may contain many emotions. If the recognition unit is small like keyword it is easy to find emotion but in sentence it may have one intension at a time. We also found such kind of emotions detection system in robots, chatting system etc

## Chapter 2

# Methodology

1.Web Scraping: Develop a web scraping module using Python and libraries like BeautifulSoup . The module will navigate through the e-commerce platform, extract product reviews, and store them in a structured format.

2.Preprocessing: Perform preprocessing steps, such as removing HTML tags, punctuation, stop words, and converting text to lowercase. This step cleans the collected reviews and reduces noise.

3.Sentiment Analysis: Utilize the VADER algorithm, a lexicon-based approach, to analyze the sentiment of each review. VADER assigns sentiment scores to individual words and combines them to calculate the overall sentiment polarity of the review.

4.Aggregation and Visualization: Aggregate the sentiment scores of all reviews to generate an overall sentiment score for the product. Visualize the sentiment distribution using charts and graphs to provide a clear understanding of customer sentiment.

5.Insights and Interpretation: Analyze the results, identify key patterns, and derive meaningful insights from the sentiment analysis..

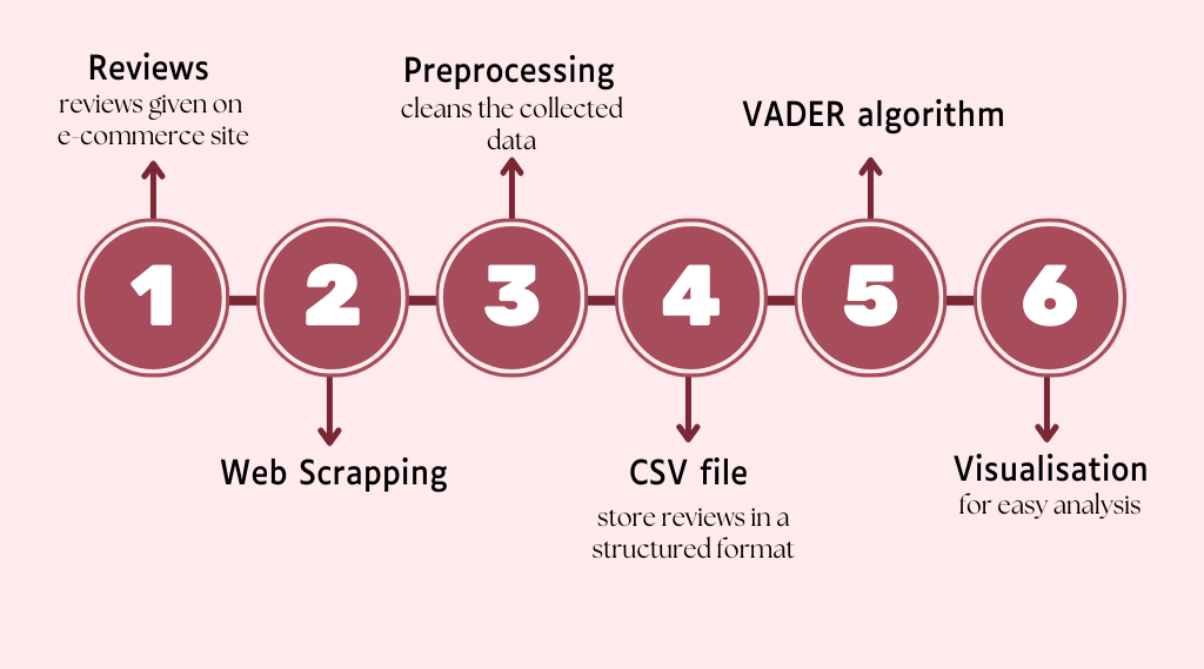
Reviews
reviews given on e-commerce site
Preprocessing
cleans the collected data
VADER algorithm
1
2
3
4
5
6
Web Scrapping
CSV file
store reviews in a structured format
Visualisation
for easy analysis

**Fig 2.1**

## Chapter 3

# Result and Discussion

The project aims to provide valuable insights from the product review analysis. The results will include aggregated sentiment scores, sentiment distribution visualizations, and key findings based on the analysis. These results assist businesses in understanding customer sentiments towards their products, identifying strengths and weaknesses, and making informed decisions to enhance customer satisfaction.

- Positive Sentiment Factors: The analysis identified recurring themes and factors that contributed to positive sentiments among customers. Common positive aspects included product quality, ease of use, and durability. Customers expressed satisfaction with the product's features, performance, and value for money. These positive factors can be leveraged by businesses to reinforce and promote the strengths of their products.

- Negative Sentiment Factors: The analysis also unveiled factors that contributed to negative sentiments among customers. Some of the common negative aspects included issues with packaging, such as damaged or inadequate packaging. Other negative factors involved product reliability, with customers reporting instances of malfunctions or defects. Addressing these negative factors is crucial for businesses to improve customer satisfaction and mitigate potential risks.

## Chapter 4

# Conclusion and Future Work

In conclusion, this project successfully implements a product review analysis system using web scraping techniques for data collection and sentiment analysis using the VADER algorithm. The analysis provides businesses with valuable insights into customer sentiments towards their products. The project accomplishes its objectives of automating the collection and sentiment analysis of product reviews.

**Future work for this project includes:**

1.Enhancing the web scraping module to handle different e-commerce platforms and improve data extraction efficiency.
2.Incorporating advanced natural language processing techniques, such as aspect-based sentiment analysis, to gain more granular insights into specific product features or attributes.
3.Exploring machine learning models to improve sentiment analysis accuracy and explore more nuanced sentiments beyond positive, negative, and neutral classifications.
4.Integrating the product review analysis system into a real-time monitoring system to continuously collect and analyze reviews, enabling businesses to respond promptly to customer feedback.
Overall, this project establishes the foundation for businesses to leverage product review analysis as a valuable tool for improving their products, enhancing customer satisfaction, and making data-driven decisions.

## References

1."Opinion Mining and Sentiment Analysis of Online Product Reviews" by M. Ganapathiraju, S. Thirunavukkarasu, and G. Suseendran. (2017)

2."Sentiment Analysis of User Reviews on E-commerce Websites" by S. Jha, D. Poria, and E. Cambria. (2018)

3."Opinion Mining and Sentiment Analysis: A Review" by P. Pang and L. Lee. (2008)

4."A Comparative Study on Sentiment Analysis Techniques for E-commerce Product Reviews" by A. Agarwal, P. Goyal, and N. Varshney. (2017)

5."Sentiment Analysis of E-commerce Product Reviews Using Machine Learning Techniques" by S. Anand, M. Gowda, and K. Narayan. (2018)