Mini Project Report

Entitled

Voice Of Customer

Submitted to the Department of Electronics Engineering in Partial Fulfilment for the Requirements for the Degree of

Bachelor of Technology
(Electronics and Communication)

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CERTIFICATE

This is to certify that the Mini-Project Report entitled "**Voice Of Customer**" is presented & submitted by GELLI SAI AJAY , S L SATYANARAYANA , bearing Roll No. U20EC108,U20EC142, of B.Tech. VI, 6^{th} Semester in the partial fulfillment of the requirement for the award of B.Tech. Degree in Electronics & Communication Engineering for academic year 2022-23.

They have successfully and satisfactorily completed their **Mini-Project** in all respects. We, certify that the work is comprehensive, complete and fit for evaluation.

Dr. Kishor Upla
Assistant Professor & Project Guide

Abstract

The modernized world, with recent technological advancements, has become more digitized. By making the products available online, e-commerce takes advantage of this digitized world by letting customers get whatever they want without stepping out. The importance of online reviews has become higher because the number of people depending on e-commerce websites for purchasing things has increased. As people believe in other opinions, going through many reviews before buying a product has become common. For a better understanding of the product, in this busy world, people don't have time to go through lots of it, so there is a need for developing a model which can polarize those reviews and generate an appropriate result. With the advancement in machine learning and different technology, this task has become much more comfortable. For this project, machine learning algorithms are used on the Amazon fine food reviews dataset to analyze whether the given review is positive or negative.

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List of Abbreviations

VADER	Valence Aware Dictionary and sEntiment Reasoner
RoBERTa	Robustly Optimized BERT Approach
NLTK	Natural Language Toolkit

Chapter 1
Introduction

1.1 Customer Feedback Analysis

Customer feedback analysis is the process of gathering and analyzing customer feedback to gain insights into customer preferences, opinions, and behaviors. This information is crucial for businesses to improve their products, services, and overall customer experience.

Customer feedback plays a critical role in customer retention and loyalty. Your customer's pain or friction points when interacting with your brand are areas you must work to improve to keep customers for the long term
Machine learning is a powerful tool for customer feedback analysis, as it allows businesses to analyze vast amounts of data quickly and accurately. By using algorithms that can automatically learn and improve from data, machine learning can identify patterns, trends, and sentiment in customer feedback data that would be difficult or impossible for humans to detect.

There are several steps involved in using machine learning for customer feedback analysis. First, businesses must collect customer feedback data from various sources, such as social media, online reviews, surveys, and customer service interactions. This data is then preprocessed, which involves cleaning, formatting, and organizing the data to prepare it for analysis.

Next, businesses can use machine learning algorithms, such as natural language processing and sentiment analysis, to analyze customer feedback data. Natural language processing algorithms can identify and extract important keywords and phrases from customer feedback, while sentiment analysis algorithms can determine whether the feedback is positive, negative, or neutral.

Finally, businesses can use the insights gained from customer feedback analysis to improve their products, services, and customer experience. By understanding customer preferences and pain points, businesses can make informed decisions about how to allocate resources and prioritize initiatives.

In summary, customer feedback analysis using machine learning is a valuable tool for businesses to gain insights into customer preferences and behaviors. By leveraging machine learning algorithms, businesses can analyze vast amounts of data quickly and accurately and use the insights gained to improve their products, services, and overall customer experience.

1.2 Flowchart

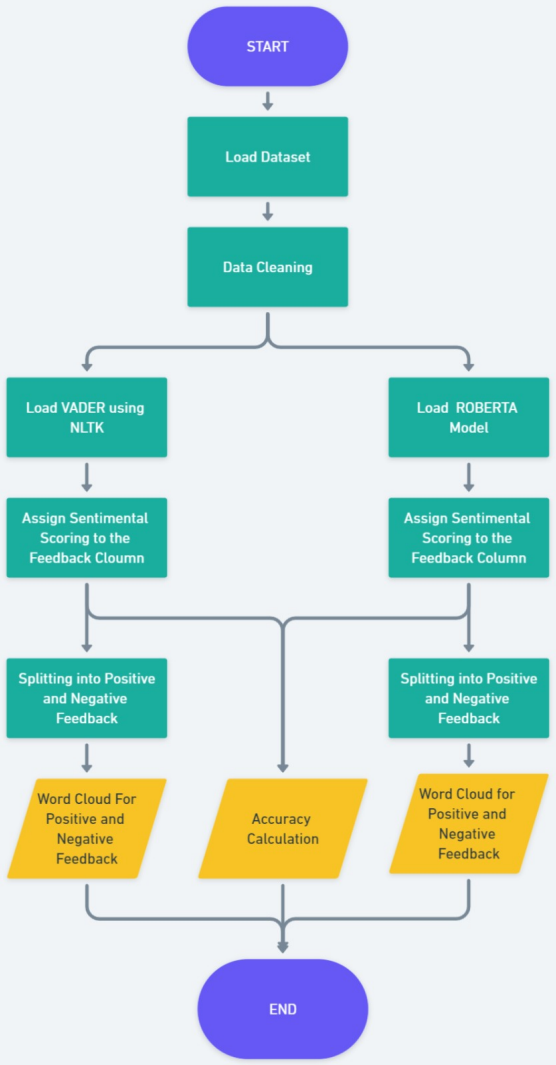

Figure 1.1: Flow of the Report

1.3 Implementation of code

We used amazon food reviews as Dataset [1]

	Id	ProductId	UserId	ProfileName	HelpfulnessNumerator	HelpfulnessDenominator	Score	Time	Summary	Text
0	1	B001E4KFG0	A3SGXH7AUHU8GW	delmartian	1	1	5	1303862400	Good Quality Dog Food	I have bought several of the Vitality canned d...
1	2	B00813GRG4	A1D87F6ZCVE5NK	dll pa	0	0	1	1346976000	Not as Advertised	Product arrived labeled as Jumbo Salted Peanut...
2	3	B000LQOCH0	ABXLMWJIXXAIN	Natalia Corres "Natalia Corres"	1	1	4	1219017600	"Delight" says it all	This is a confection that has been around a fe...
3	4	B000UA0QIQ	A395BORC6FGVXV	Karl	3	3	2	1307923200	Cough Medicine	If you are looking for the secret ingredient i...
4	5	B006K2ZZ7K	A1UQRSCLF8GW1T	Michael D. Bigham "M. Wassir"	0	0	5	1350777600	Great taffy	Great taffy at a great price. There was a wid...

Figure 1.2: Dataset

Figure 1.3: Reviews vs Star

1.3.1 Sentiment Analysis

Sentimental analysis is a technique used to extract subjective information from text by identifying its overall sentiment as positive, negative, or neutral. It can be performed

using lexicon-based, machine learning-based, or hybrid approaches and has many applications in marketing, customer service, and political analysis.

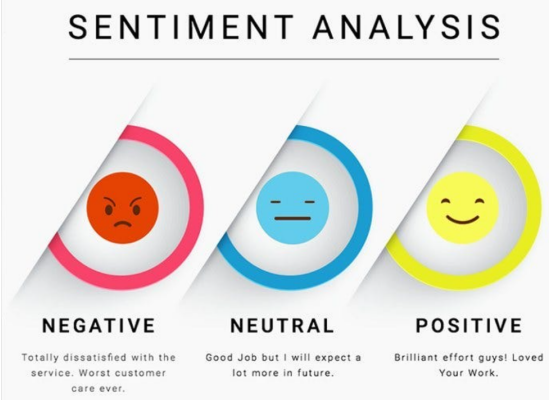

Figure 1.4: Sentiment analysis

In our case, we have implemented feedback analysis using

- **VADER(Valence Aware Dictionary and sEntiment Reasoner)** which is a part of the NLTK Library that is specifically designed for sentimental analysis. NLTK included several machine learning algorithms and a Naive Bayes classifier for sentiment analysis [2]

```
Accuracy VADER  0.6311434170574928
```

Figure 1.5: Accuracy Of VADER

- **Roberta-(Robustly Optimized BERT - Pretraining Approach)** which is a language model that is trained using unsupervised learning such as Transformer Architecture. Roberta Model is developed by Facebook AI. It is trained on a large corpus of text data and capable of understanding the context and meaning.

```
Accuracy Roberta: 0.9036144578313253
```

Figure 1.6: Accuracy of ROBERTA

1.3.2 Word Cloud

For VADER(Valence Aware Dictionary and sEntiment Reasoner)

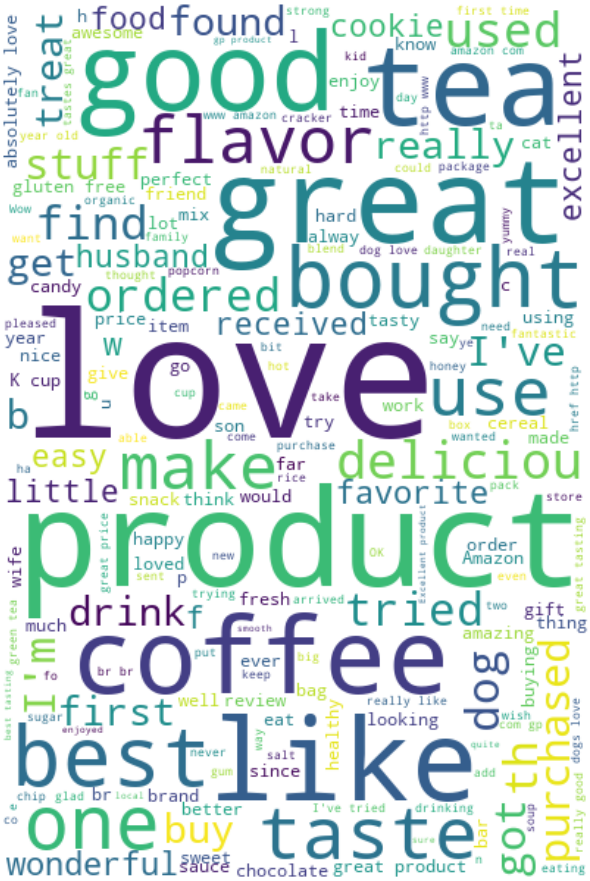

Figure 1.7: Word cloud for positive sentimental score for VADER

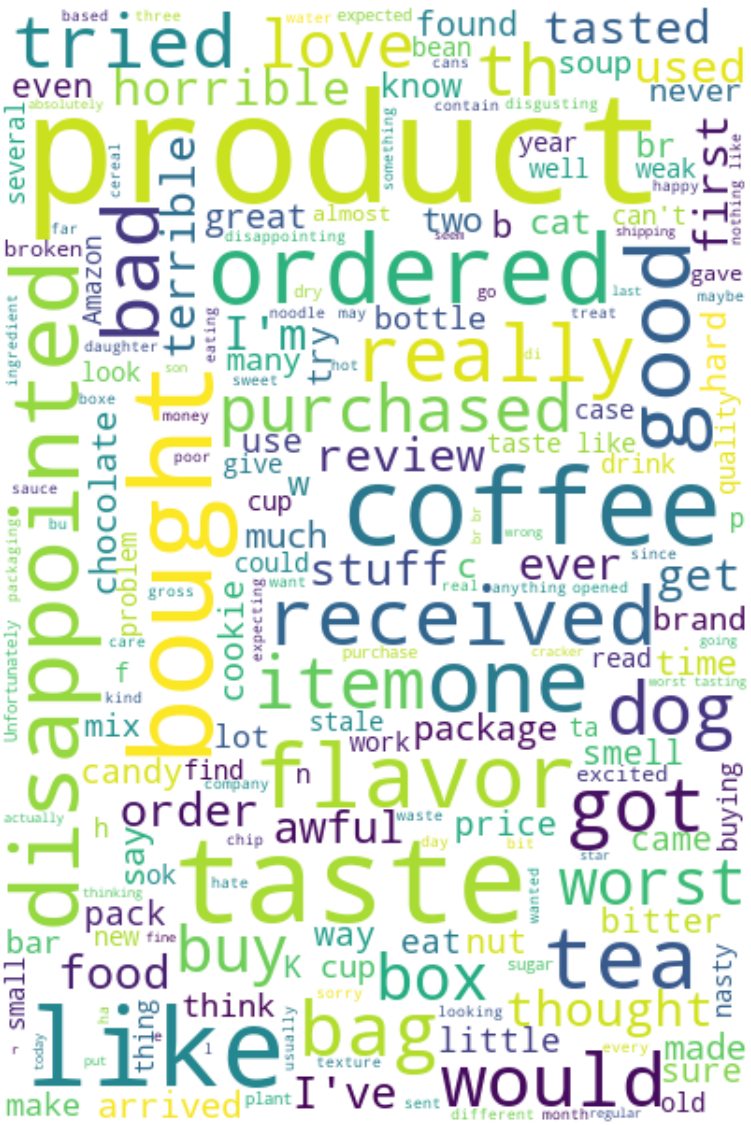

Figure 1.8: Word cloud for negative sentimental score for VADER

Conclusion

Through this project, we analysed customer feedback using VADER and ROBERTA models and achieved accuracy rates of 63% and 90.36% respectively. The use of word-clouds also provided insights into customer sentiment towards the product. The models were applied to Amazon food reviews, resulting in a 63.11% accuracy rate for VADER and 90.36% accuracy rate for ROBERTA. The results demonstrate that ROBERTA is a more robust model than VADER for sentimental analysis.

Product forecasting based on reviews involves analyzing customer feedback to predict future sales or demand for a particular product. This process can be facilitated by using Natural Language Processing techniques to perform a sentimental analysis of the reviews. This project used VADER and ROBERTA models to analyze customer reviews of Amazon food products. The sentiment analysis accuracy of the VADER model was 63%, while that of the ROBERTA model was 90.36%, demonstrating the superior accuracy of the ROBERTA model. Businesses can use these insights and sales data to make informed decisions about their product strategy, pricing, and marketing to improve customer satisfaction, increase sales, and gain a competitive edge.

References

[1] S. Yarkareddy, T. Sasikala, and S. Santhanalakshmi, "Sentiment analysis of amazon fine food reviews," in *2022 4th International Conference on Smart Systems and Inventive Technology (ICSSIT)*. IEEE, 2022, pp. 1242–1247.

[2] R. Mulla, "Python sentiment analysis project with nltk and transformers," in *https://www.youtube.com/watch?v=QpzMWQvxXWk*. youtbe, 2022, pp. 1242–1247.