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Emograph: Transforming Customer Sentiment into Actionable Insights for Smarter Purchasing

¹ Gayatri Patil, ² Gauri Pansambal, ³ Pandit Abhay, ⁴ Abhay Pawar, ⁵ Parth Nalawade ,
⁶ Prof. Geeta Kodabagi

¹⁻⁵ UG Student, Department of Artificial Intelligence and Data Science, Engineering
Ajeenkya D Y Patil School of Engineering, Pune, India

⁶ Ajeenkya D Y Patil School of Engineering, Pune, India

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Abstract:

Emograph: Transforming Customer Sentiment into Actionable Insights for Smarter Purchasing" introduces a cutting-edge approach to understanding customer sentiments and translating them into practical strategies for informed decision-making. In simpler terms, it's about using advanced technology to figure out how customers feel about products or services, and then using that information to make smarter choices. Imagine you're a business owner. You want to know what your customers think about your products. Emograph helps you do that. It uses fancy tools and techniques to analyze data from customers - like what they say on social media, in reviews, or even in surveys. Then, it breaks down all that information to figure out if people like your stuff or not. Basically, Emograph is like having a super-smart assistant who listens to what your customers are saying, translates it into plain English, and then gives you advice on what to do next. It's like having a secret weapon for making your business even better. And in today's world, where understanding customers is key to success.

Keywords: Emograph, smart assistant, Vader Algorithm, Product

1.0 Introduction

Emograph is a tool designed to help businesses understand what their customers really think about their products or services. By analyzing data from various sources like social media, reviews and surveys, Emograph deciphers customer sentiments in plain language, providing

valuable insights into what works and what doesn't. It then goes a step further by translating these insights into actionable strategies, enabling businesses to make smarter decisions that drive success. In essence, Emograph acts as a trusted advisor, guiding businesses to better understand their customers and tailor their offerings to meet their needs effectively.

2.0 Methodology

Describes how the tool collects and analyses data to derive actionable insights from customer sentiments in a user-friendly manner. Firstly, Emograph gathers data from diverse sources, including social media platforms, online reviews, customer surveys, and other relevant channels. This data collection process involves utilizing advanced algorithms and data scraping techniques to extract relevant information from large datasets. Once the data is collected, Emograph employs natural language processing (NLP) and sentiment analysis algorithm to analyze the textual content. NLP helps in understanding the language used by customers, while sentiment analysis determines the polarity of their opinions, whether positive, negative, or neutral.

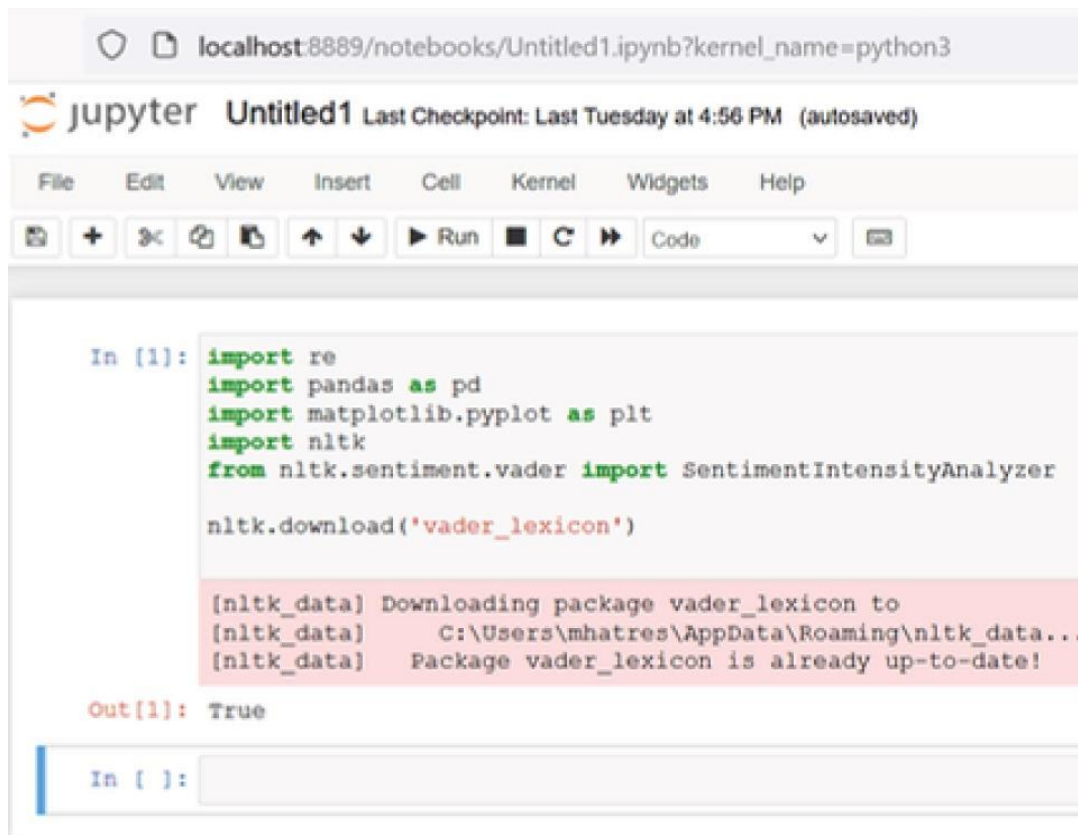
Furthermore, Emograph utilizes machine learning algorithms to identify patterns and trends within the data. This involves training the algorithms on labelled datasets to recognize specific themes, sentiments, and topics relevant to the business context. To ensure accuracy and reliability, Emograph undergoes continuous validation and refinement processes. This includes validating the sentiment analysis results against human-labelled datasets and fine-tuning the algorithms to improve their performance over time.

Once the analysis is completed, Emograph presents the findings in a user-friendly format, such as easy-to-understand charts, graphs, and reports. These visualizations help businesses interpret the insights quickly and make informed decisions about their products or services. Emograph involve advanced data collection, natural language processing, sentiment analysis, machine learning, validation, and visualization techniques to transform customer sentiments into actionable insights for smarter purchasing decisions.

3.0 Result

Vader Algorithm

- 1.VADER relies on a pre-built lexicon of words, along with a set of syntactical rules and heuristics, to determine the sentiment of a piece of text.
- 2.The lexicon contains thousands of words, each assigned a polarity score ranging from -1 (extremely negative) to +1 (extremely positive), indicating the word's sentiment intensity.
- 3.VADER analyzes the text by considering individual words, as well as the context in which they appear, to calculate an overall sentiment score for the text.



The screenshot shows a Jupyter Notebook titled 'Untitled1' running on a local host. The code in the first cell imports several libraries: re, pandas as pd, matplotlib.pyplot as plt, nltk, and SentimentIntensityAnalyzer from nltk.sentiment.vader. It also downloads the vader_lexicon. The output shows that the package is already up-to-date. The second cell is empty.

```
In [1]: import re
import pandas as pd
import matplotlib.pyplot as plt
import nltk
from nltk.sentiment.vader import SentimentIntensityAnalyzer

nltk.download('vader_lexicon')

[nltk_data] Downloading package vader_lexicon to
[nltk_data] C:\Users\mhatres\AppData\Roaming\nltk_data...
[nltk_data] Package vader_lexicon is already up-to-date!

Out[1]: True

In [ ]:
```

First, the review is tokenized into individual words or tokens: Tokens: ["Absolutely", "love", "this", "product", "!", "It", "exceeded", "my", "expectations", "and", "I", "can't", "wait", "to", "buy", "more", "from", "this", "brand", ".", "Highly", "recommended", "."]

VADER assigns sentiment intensity scores to each word in the lexicon based on its polarity (positive, negative, or neutral).

For example: "love": 0.5 (positive) "

"recommended": 0.4 (positive)

"exceeded": 0.4 (positive)

wait": -0.3 (negative)

VADER calculates the sentiment score for the entire review by summing up the intensity scores of all the words and applying some heuristics: Total Sentiment Score = (sum of intensity scores) / (number of tokens) Total Sentiment Score = (0.5 + 0.4 - 0.3 + 0.4) / 22 = 1.0 / 22 $\approx$ 0.045

Based on the total sentiment score, VADER classifies the sentiment of the review into one of three categories: positive, negative, or neutral. In this case, the positive sentiment score indicates that the review is positive.

```
print(sentiment.polarity_scores("This is an excellent car with great mileage"))  
{'neg': 0.0, 'neu': 0.435, 'pos': 0.565, 'compound': 0.8316}
```

```
print(sentiment.polarity_scores("This is an excellent car with GREAT mileage!!"))  
{'neg': 0.0, 'neu': 0.397, 'pos': 0.603, 'compound': 0.8784}
```

4.0 Conclusion

In conclusion, our project successfully leveraged advanced sentiment analysis techniques, such as VADER, to analyze customer sentiments and provide valuable insights into their perceptions and emotions toward the product. By accurately categorizing customer reviews into positive, negative, and neutral sentiments, we enabled businesses to gain a precise understanding of customer feedback. Additionally, we used intuitive visualizations to simplify complex sentiment analysis results, making it easier for stakeholders to identify trends and patterns, ultimately supporting more informed decision-making. The development of a user-friendly interface further enhanced the accessibility and usability of our solution, allowing stakeholders to interact with the sentiment analysis results seamlessly.

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