Project Proposal

on

Brand's Sentiment Analysis

Due: 2022-10-24

CS 410: Text Information Systems

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by

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1 Project Topic

Perform sentiment analysis on Twitter tweets for a given brand to help companies gain insights on their brand or on product(s).

2 Motivation

The customer feedback to any product is very crucial in brand building as it allows to gain an overview of the wider public opinion. **Sentiment Analysis** aka. *opinion mining* is the area which deals with judgments, responses as well as feelings generated from such texts. Sentiment analysis can help companies to automatically read tons of product reviews and extract useful and meaningful information to discover if the customers are really satisfied with their product or not. The next question is how to gain access to users feedback, should the companies have some forms to collect surveys or questionnaires? This sounds a reasonable approach to gain immediate feedback if all of our intended users respond back to survey forms. But in today's word people are more vocal on social media platforms such as Twitter instead of responding back to some survey's. Hence, companies always find a problem of not getting the correct/enough feedback on its products. The motivation of this project is to help companies to gain insights about it's product using Sentiment analysis, POS (Part of Speech) Tagging and Natural Language understanding techniques on Twitter tweets. Twitter is one of the platforms widely used by people to express their opinions and showcase sentiments on various occasions. Using the companies brand or product sentiment details, companies can boost their business on following five areas:

- Sentiment Analysis to improve Customer Service
- Sentiment Analysis to boost the product and services
- How to improve their Marketing Campaigns
- Monitor Brand's Perception
- Track the Sentiments in Real-Time

3 Description

3.1 What is the Task

The purpose of the task is to extract tweets for a given Fast-moving consumer goods (FMCG) brand and analyse the sentiment of their consumers. Further natural language analysis will then be performed, to give the company insights into the demographics and the topics the consumers are tweeting about.

3.2 Why is it important

For a brand, online reputation is its most important asset. Twitter is a major source of consumer insight, that people use to express all the their feelings, beliefs and opinions. This makes it a good source to analyse customer sentiments in real-time, adding a new dimension to social media monitoring. The idea is to exploit the user opinions of a brand to drive decisions, promote the brand and most importantly, improve customer experience.

3.3 Design Approach

The design approach is divided into following sections:

- **Section 1: Connectivity to Twitter**: In this section, we need to connect to Twitter API using *Tweepy* library to obtain tweets for the selected brand over time.
- **Section 2: Tweets Processing**: Perform tweets data processing by removing stop words, stemming, lemmatizing, removing non-text data and converting the tweets into a JSON array of words per tweet.
- **Section 3: Sentiment Analysis**: Perform sentiment analysis on the obtained tweets to capture the sentiments of consumers using python coding. We also plan to calculate the **NPS (Net Promotor Score)** of a brand using the obtained sentiments feedback.
- **Section 4: Build a Web Application**: Create a web application using Streamlit that allows end users to perform sentiment analysis on the given brand. The dashboard will depict the sentiments on the number of tweets and show the top 10 trending hashtags and mentions used in those tweets. We also plan to showcase sentiment trends over the selected period and the NPS score of a brand.
- **Section 5: Integration Phase**: In this phase, we plan to integrate all sections together to allow a real-time tweets sentiment analysis using a Web application.
- **Section 6: Project Documentation and Demo**: The final phase of our project includes preparing and documenting our project and creating a demo video for submission.

3.4 Tools and Technology

The project will be done entirely using open-source Python libraries, APIs and frameworks.

- **Tweepy**[1]: An easy-to-use Python library for accessing the Twitter API
- **NLTK** [2]: Python library that provide tools for Natural Language Processing (NLP). E.g nltk.stem.wordnet, nltk.corpus.
- **Streamlit** [3]: A Python framework to deploy, manage and share the application on Web. This will be used to create an end-user framework in our project.
- **Other Packages/Libraries**: Python Numpy, pandas, pytz, textblob, configparser.

3.5 Expected Outcome

The goal of the project is to create a web application, that would let a company (user) fetch the most recent N tweets about their brand and give them insight into the consumers sentiment of their product. We will also provide some additional analysis based on customer demographics like location, sentiment over time based on the NPS score and an overview of the topics currently trending about the brand.

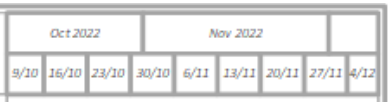
[1]https://docs.tweepy.org/en/stable/api.html
[2]https://www.nltk.org/
[3]https://streamlit.io/

4 Team Members

- Ayush Khanna (Net ID: **akhanna6**) - Team Lead
- Ethan Alberto (Net ID: **ethanma3**)
- Jayanth Chandra (Net ID: **jc101**)

5 Project Plan

ID	Task Name	Start	Finish	Duration
1	Ideation	10/10/2022	17/10/2022	6h
2	Project Proposal	17/10/2022	21/10/2022	5h
3	Authentication of the Twitter API	24/10/2022	25/10/2022	2h
4	Data preprocessing	25/10/2022	31/10/2022	5h
5	Building a model for sentiment analysis	01/11/2022	10/11/2022	8h
6	Topic modelling	02/11/2022	16/11/2022	11h
7	Progress Report	10/11/2022	14/11/2022	3h
8	Other NLP analysis for further insight	17/11/2022	25/11/2022	7h
9	Creating an interactive application	01/11/2022	30/11/2022	22h
10	Final project report, documentation and presentation	21/11/2022	08/12/2022	14h



6 References

- https://medium.com/swlh/tweet-sentiment-analysis-using-python-for-complete-beginners-4aeb4456040
- https://medium.com/mlearning-ai/web-scraping-word-cloud-nlp-techniques-amazon-product-review-99c1d44e58e8
- https://www.surveymonkey.com/mp/nps-calculator/