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Sentiment Analysis of Statement

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Abstract : *Sentiment analysis is one of the fastest growing research areas in computer science, making it challenging to keep track of all the activities in the area. Sentiment analysis is a technology with great practical value; it can solve the phenomenon of network comment information disorderly to a certain extent, and accurate positioning of user information required. Internet has opened the new doors for information exchange and the growth of social media has created unprecedented opportunities for citizens to publicly raise their opinions, but it has serious bottlenecks when it comes to do analysis of these opinions. Even urgency to gain a real time understanding of citizens concerns has grown very rapidly. Since, the viral nature of social media which is fast and distributed one, some issues get rapidly distributed and unpredictably become important through this word of mouth opinions expressed online which in turn has known as sentiments of the users. The decision makers and people do not yet realized to make sense of this mass communication and interact sensibly with thousands of others with the help of sentiment analysis.*

Keywords: *Sentiment analysis, text mining, literature review, Natural Language Processing, Tensor Flow*.

I. Introduction

Sentiment analysis is a series of methods, techniques, and tools about detecting and extracting subjective information, such as opinion and attitudes, from language. Traditionally, sentiment analysis has been about opinion polarity, i.e., whether someone has positive, neutral, or negative opinion towards something. The object of SA has typically been a product or a service whose review has been made public on the Internet. This might explain why sentiment analysis and opinion mining are often used as synonyms, although, we think it is more accurate to view sentiments as emotionally loaded opinions. The area of SA has become so large that any individual researcher would face several issues when keeping track of all the activities in the area and the information overload.

SA refers to the use of NLP, text analysis, computational linguistics, and biometrics to systematically identify, extract, quantify, and study affective states and subjective information. Recently, several websites encourage researchers to express and exchange their views, suggestions and opinions related to scientific papers. SA aims at determining the attitude of a writer with respect to some topics or the overall sentiment polarity of a text, such as positive or negative. Time is money or even more valuable than money therefore instead of spending time in reading and figuring out the positivity or negativity of text we can use automated techniques for SA.

II. Related Work

SA has been handled as a NLP task at many levels of granularity. The literature survey for the SA is done from the "The evolution of sentiment analysis" – Mika Mäntylä, Daniel Graziotin , Miikka Kuutila (2017) , "Sentiment Analysis of Twitter Data" - Apoorv Agarwal, Boyi Xie Ilia Vovsha Owen Rambow Rebecca Passonneau, "Research On Sentiment Analysis: The First Decade", Oskar Ahlgren(2015), "Recent Trends in Deep Learning Based Natural Language Processing" by Tom Young, Devamanyu Hazarika, Soujanya Poria, Erik Cambria and many other references.

We face the difficulty of evaluation sentiments shows in that selective the suitable sentiment technique to understand part of speech of the language. The accurate meaning is a very important source in making a decision. Sentiment evaluation requires a huge lexicon for dealing with the sentiments and their polarities. SE has several challenges including spam or fake reviews as well as the duplication of reviews. The implicit and explicit negative is one of the most challenges faced in the evaluation process with respect to the similar structures for several expressions. The world knowledge is an obstacle in analyzing sentiments; it requires identifying famous knowledge and information. Other challenges appear in the bipolar sentiments and short sentence like abbreviations. All challenges have a bad effect on the understanding of reviews and the SE.

The Objectives behind this analyzer is to collect the data in Text or Audio format and then to analyze the sentiments behind it. Analyzing the statements using NLP and giving the result in the human understandable representation.

III. Methodology

1. Sentiment Analysis

Sentiment analysis is a method for gauging opinions of individuals or groups, such as a segment of a brand's audience or an individual customer in communication with a customer support representative. Based on a scoring mechanism, sentiment analysis monitors conversations and evaluates language and voice inflections to quantify attitudes, opinions, and emotions related to a business, product or service, or topic. As part of the overall speech analytics system, sentiment analysis is the integral component that determines a customer's opinions or attitudes.

SA is often driven by an algorithm, scoring the words used along with voice inflections that can indicate a person's underlying feelings about the topic of a discussion. Sentiment analysis allows for a more objective interpretation of factors that are otherwise difficult to measure or typically measured subjectively, such as:

- The amount of stress or frustration in a customer's voice
- How fast the individual is speaking (rate of speech)
- Changes in the level of stress indicated by the person's speech (such as in response to a solution provided by a customer support representative).

Methods of Sentiment Analysis:

1. Data Collection
2. Text Preparation
3. Sentiment Detection
4. Sentiment Classification
5. Presentation of Output

2. Natural Language Processing (NLP):

Natural Language Processing (NLP) is the best way to understand the language used and uncover the sentiment behind the expression of any person's statement or expression. People often consider sentiment (in terms of positive or negative) as the most significant value of the opinions users express via social media**.** NLP for SA focused on emotions is extremely useful. NLP for speech analysis, combined with a powerful social media monitoring strategy, organizations can understand customer reactions and act accordingly to improve customer experience, quickly resolve customer issues and change their market position. Natural language processing (NLP) is a theory-motivated range of computational techniques for the automatic analysis and representation of human language. NLP research has evolved from the era of punch cards and batch processing, in which the analysis of a sentence could take up to 7 minutes, to the era of Google and the likes of it, in which millions of web pages can be processed in less than a second. NLP enables computers to perform a wide range of natural language related tasks at all levels, ranging from parsing and part-of-speech (POS) tagging, to machine translation and dialogue systems.

3. Tensor Flow:

Tensor Flow is a free and open-source software library for dataflow and differentiable programming across a range of tasks. It is a symbolic math library, and is also used for machine learning applications such as neural networks. It is used for both research and production.

Machine learning (ML) is the scientific study of algorithms and statistical models that computer systems use to effectively perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model of sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to perform the task. Machine learning algorithms are used in a wide variety of applications, such as email filtering, and computer vision, where it is infeasible to develop an algorithm of specific instructions for performing the task. Machine learning is closely related to computational statistics, which focuses on making predictions using computers. The study of mathematical optimization delivers methods, theory and application domains to the field of machine learning

IV. Figures And Tables

1. Project Flow Model:

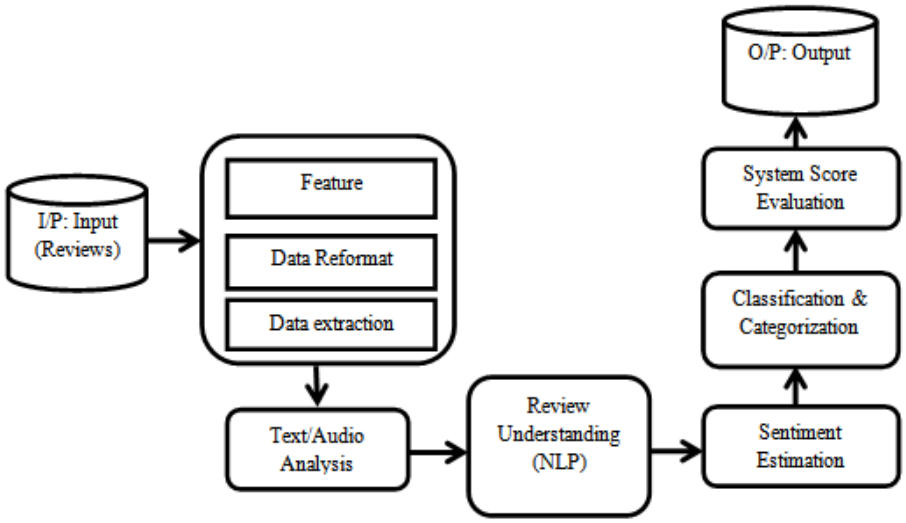

Fig. 1 Project Flow Model

We do not get the exact expression of the statements, which may be in the form of reviews, feedbacks, etc. With the use of this analyzer we can detect the user behavior or sentiments with the help of graphical representation such as Pie chart, Bar chart, etc. in percentage.

2. Flow Chart Diagram:

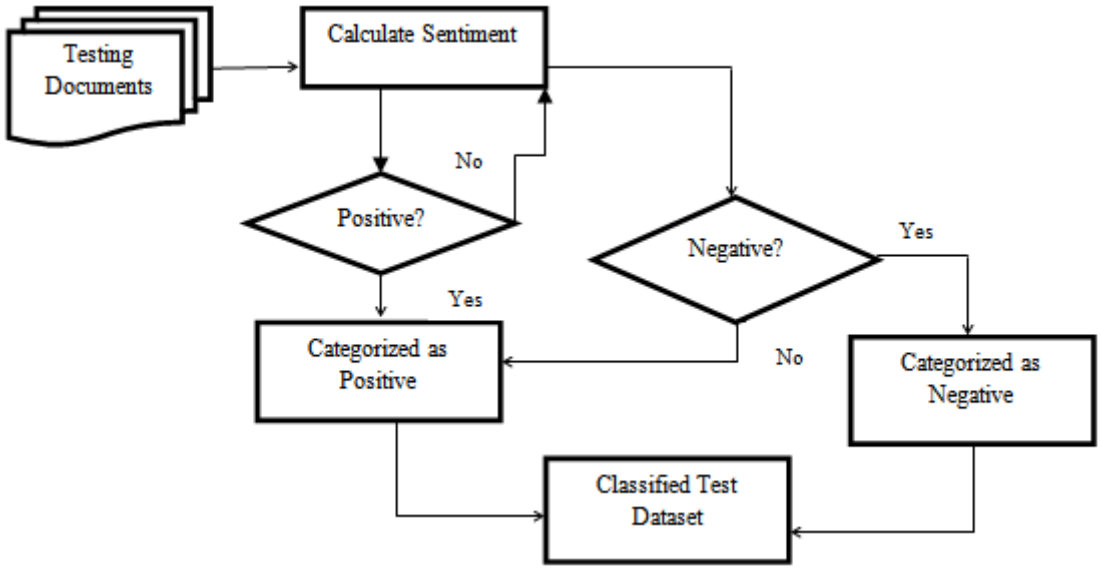

Fig. 2 Flow Chart Diagram

Feedback reviews: if a person giving review to anything we can analyze the statement as positive or negative. We can analyze user's behavior using the Tensor Flow in NLP.

V. Conclusion

The conclusion of our work presents a new technique for analyzing sentiment reviews. We work to improve accuracy for sentiment reviews and understand implicit and explicit meaning accurately.

In future, more work is needed on further improving the performance measures. Sentiment analysis can be applied for new applications. Although the techniques and algorithms used for sentiment analysis are

advancing fast, however, a lot of problems in this field of study remain unsolved. The main challenging aspects exist in use of other languages, dealing with negation expressions; produce a summary of opinions based on product features/attributes, complexity of sentence/document, handling of implicit product features, etc. More future research could be dedicated to these challenges.

Abbreviations and Acronyms

NLP - Natural Language Processing
SA - Sentiment analysis
SE – Sentiment Evaluation

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