Sentiment Analysis of Lockdown in India During Covid-19: A Case Study on Twitter Computational Social System

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ABSTRACT

Sentiment analysis has quickly become one of the most prominent fields of natural language processing due to the spectacular increase in Internet usage (NLP). For a variety of situations, sentiment analysis can successfully extract the text's inferred emotion. During the COVID-19 epidemic, a tremendous amount of information is being received and shared on social media. Mining such content to assess people's attitudes may substantially improve decision-making in order to maintain control of the situation. In this study, sentiment analysis of tweets has been completed using NLP and machine learning classifiers. The data have been scraped from Twitter, annotated with Text Blob, and pre-processed using the natural language processing tools provided into Python. The study focuses on the sentiment analysis of people during COVID-19 pandemic in India. RNN is used for obtaining a tolerable level of emotion prediction. The proposed method categorized emotions into three categories such as positive, neutral and negative, and obtained an accuracy rate of 90% with a prediction that people support the government's decision to impose the lockdown during the spread of COVID-19.

1. INTRODUCTION

Sentiment Analysis is a method for examining people's feelings, attitudes, and opinions about an item, association, or administration. Opinion investigation is a kind of statistical surveying that utilizes text examination, biometrics, normal language handling (NLP), and computational semantics to decide the condition of information.

It's normal as far as we're concerned to consider about what others think while deciding. Large numbers of us de- pended on loved ones for item or administration ideas or data before the Internet's appearance. The Internet facilitates our efforts to obtain public opinion. The volume of data gen- erated by users produced every minute is humongous. It is not humanely possible to gather entire data and decipher the meaning conveyed through the same. Effectively, it becomes very much essential to bring automation in classification of evaluations. Such evaluations are labeled as neutral, positive or negative. An example could be part of an email, social me- dia content description, or a blog article. Sentiment analysis is useful to dissect public opinion and extract the understanding of consumer experiences.

There is a huge growth in volume of stream data continuously generated through social media platforms like Face-book, Twitter, etc. Behavioral science is one of the highly suitable domains providing fresh Twitter content. Twitter is also historically known as a very potent source of data for re- search of psychology. It's very interesting to analyze how catastrophic events affects sentiments of people e.g. How people react to Coronavirus outbreak and in the subsequent lockdown [1, 2].

It's also observed that researchers have taken keen interest to analyze tweets when different COVID-19 vaccines were made available to public. There are interesting observations at the global, national, and state levels in such incidents. Sentiments are extracted using latent Dirichlet allocation analysis. Temporal analysis is used to look at patterns across time. Geographic analysis, as the name suggests, localities. It deals with contents generated in the form of tweets from different residential areas [3].

Also, Twitter data has been used to investigate human psychology under catastrophic events like COVID-19 pandemic. With the COVID-19, there is huge impact on economy, jobs, social transformations which, to some extent, has resulted into depression and psychological disorders [4]. As psychology of people is reflected in the content generated, feelings of people about lockdown / social distancing enforced by states are a potential area of research [5].

Authors studied multiple data sources in Massachusetts [6] and investigated alterations in polarization of tweets, opined anxiety. It is also composed of discussion on health concerns. This was executed on subset of all tweets chosen stochastically. It can be done using symbolic as well as ML techniques. The prior is time consuming and tedious, scientists' resort to use ML [7].

To elicit feedback from fellow countrymen, Indonesian government has given a lot of emphasis too social network. Analysis of Twitter contents for coronavirus vaccines has proved very effective in their case. Naïve Bayes Algorithm was employed for the exercise [8]. SVM and CRF techniques have been successfully employed by researchers to classify feelings at the sentence level considering emoticons [9] and opinion mining using recommender system.

Extraction of salient topics, themes, and attitudes is done by authors [10] using LDA. They worked upon prominent unigrams and bigrams. Researchers of Typhoon Sandy found out how client opinions vary reliant upon distance from the catastrophe and concluded that as passionate uniqueness rises, the chance of retweeting a tweet diminishes [11]

2.LITERATURE SURVEY

In [1] the author of this study sought to understand Indian citizens' reactions to the Indian government's nationwide lock- down. The lockdown was applied to control outbreak of corona virus. In this study, tweets written by Indian citizens were analyzed by NLP and ML classifiers. The dataset was gathered during 5th April, 2020 to 17th April, 2020. It provided 12, 741 tweets with the hashtag 'India lockdown'. Tweedy library, TextBlob & Vader lexicons and NLTK were used.

This article examines [2] public opinions toward social separation as expressed in Twitter textual data. The SentiStrength algorithm was used to calculate the polarity of emotions in Twitter data from Canada, as well as tweets containing social distancing keywords. Sentiment was classified using SVM approach. In [3], Refers to sentiment analysis of tweets related to the covid-19 vaccine and to examine changes in sentiment at the global, national, and state lev- else in the USA. The

compound score is produced using the Valence Aware Dictionary and the sentiment Reasoner.

This paper [4] is about human brain science under horrendous circumstances. The Coronavirus pandemic is a debacle that has brought about a huge number of mental hardships, including wretchedness, because of unexpected social changes and an absence of occupations. With the Coronavirus pan- demic, numerous nations had various tops, with the ascent and reduction of new cases influencing lockdowns, which directly troubled occupations. During the surge of COVID-19 cases with tighter lockdowns, people have been venting their frustrations on social media. This could lead to a better understanding of human psychology in emergency situations.

In [5], author aim is to study sentiments of people about lockdown/social distancing. Besides using mask and sanitizers, Indian Government has also decided to maintain proper social distancing or lockdown. In this paper, they have collected twitter data of people across India, during March to June and then using NLP, the polarity is measured, i.e., positive, negative or neutral. After that, they have used SVM classifier and Logistic Regression.

In [6], temporal trends of Twitter posts in Massachusetts (MA) were area of focus. They researched changes in tweet feeling extremity, communicated nervousness, and conversation on hazard and wellbeing themes on partial subset of tweets. They find tremendous contrasts between tweets. It justifies the use of Twitter data, particularly when paired with other observational data.

In [7], symbolic and ML are the two techniques for sentiment analysis. ML techniques are more sophisticated and time- consuming than symbolic alternatives. Different classifiers based on entropy and ensemble, such as Naïve Bayes, SVM, and Maximum Likelihood Classifiers, are used to assess the classification accuracy of the feature vector.

In [8], Indonesian government formed a team to foster development of COVID vaccines. With over 9.5 crores of con- firmed cases, over 20 lacs deaths reported worldwide, the task force elicited feedback from countrymen using Twitter for the COVID-19 vaccine. The exercise used the Naïve Bayes technique to analyze Twitter data gathered for the phrase ’Vaccine COVID-19

2. PROPOSED SYSTEM

Types of sentiment analysis

Fine-grained:

This type of sentiment analysis version leads researcher to precision of polarity. Outcome of the polarity can be classified as extraordinarily high quality, superb, impartial, terrible, or very negative. When it comes to reviews and scores, fine-grained sentiment evaluation is beneficial.

Emotion Detection:

Emotion detection allows you locate feelings. This will encompass anger, sadistic behavior, exuberance, dissatisfaction, uneasiness, dismay, etc. Emotion detection exercises usually employ lexicons. It is nothing but a group of phrases that emote specific feelings.

Aspect-based:

It facilitates you to determine the factors of which one is speaking. Let’s say; you’re a mobile cellphone manufacturer, and you get a client evaluate declaring, “the digital camera struggles in synthetic lights situations." Tentatively, one can gauge that the customer is not happy about a specific camera functionality.

Intent analysis:

Many a times consumers are doing window shopping. They may be interested in a product but may not afford it im- mediately. Sometimes, they may be evaluating it or compar- ing with some other product. Such consumers are popularly known as tyre kickers. They do not contribute to the bottom line. Identifying such customers ahead of time precisely can help organizations to invest economically w.r.t. strategy, fi- nance. It can also save physical efforts and time to market. Chasing such customers is often a waste of resources. Intent analysis can prove handy to resolve this challenge. It helps us identify whether customer is genuine or a time waster.

Procedure of Implementation.

Sentiment analysis comprises of steps as given below: Data collection: The gathering of data is the first and foremost important step. Without availability of reliable data, no ML experiment can be successful.

Pre-processing: After collecting the data, often the data is not in good shape. Preprocessing enables researcher to clean the data. It assists to lessen, if not eliminate, noise in the data. The noise usually causes trouble while extracting insights. Usual actions taken relate to removal of stop words, repeated words. Stemming and lemmatization are bare necessities in case NLP work. Other peripheral activities such as removal of emoticons and URLs are essential, too.

Feature extraction: If incorrect features are selected for analysis, it leads to poor result. Hence, precise selection of features is a crucial activity in working out the accuracy of the model. Extraction of the features is obvious successor step to selection.

Sentiment classification: There is multiple ML and DL techniques used for classification. Variants of Bayesian techniques such as Naïve Bayes (NB) and SVM are the widely used ones.

Polarity detection: The polarity calculation comes next to sentiment classification. The eventual outcome of polarity detection is classes viz. positive, negative or neutral. It indicates what the text indicates overall psychologically.

Validation and evaluation: The model developed is of no use unless its results are confirmed by any validation technique. Accuracy of the sentiment analysis model is deter- mined by the evaluation methods. Only after this exercise, that the model can be practically applied.

4. CONCLUSION

Sentiment Analysis is a technique for examining people's emotions, attitudes, and views about a product, service, or organization. Businesses and governments utilize sentiment analysis to make decisions based on the data.

This article highlights the numerous obstacles that exist in sentiment analysis, as well as what has been done and what still needs to be done in terms of various research opportunities. We also looked at the many forms of sentiment analysis, how to classify sentiment analysis, and how to employ sentiment analysis approaches.

We have largely focused on perceptions of people associated with Covid-19 pandemic, lockdown. We zero-in on influence of these on health and scientific discipline. We have tendency to gather publications that use varied machine learning approaches to perform sentiment analysis. The results and strategies utilized in used in these studies have been mentioned.

5. REFERENCES

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