SENTIMENT ANALYSIS OF TWEETS ON AUSTRALIAN BUSHFIRE

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ABSTRACT

People's way of expressing their views and opinions has changed over years. Today people have many sources / means to express their views, opinion and sentiments, like Twitter, Facebook, Instagram and other social media platforms. This paper is aimed at extracting and analyzing people's opinions, sentiments and emotions expressed about the Australian bushfire in Twitter. The analysis is done using R language which helps in collecting the information and to analyse the sentimental phrase, the extremes of sentiments quoted through the hash tag and the sentiment score for each phrases and tweets. Further, the paper exemplifies the applications and limitations of this research.

KEYWORDS: Sentiment analysis, Hash tag, Australian bushfire

INTRODUCTION

The problem of the decade that has been increasing for a long time and reached a place where it should be concerned more is natural conditions like climate change. The recent climatic conditions which directed the researches to study more on the environmental factors and they call it as the anthropogenic researches. In comparison to past decades the climate changes are noticed more in this decade. According to WMO (World Meteorological Organization) the global average temperature rise is 1.1 degree Celsius which is responsible for the occurrence of frequent heat waves, floods and wildfires than the past century. The one of the worst condition that has been said to be one of the major disasters is the Australian bushfire. Australia is the smallest continent and the world's sixth-largest country by total area. The population is over 26 million with capital of Canberra. Australia is split from the rest of the world by oceans and has the oldest, flattest and driest inhabited continent, with the least fertile soils (Australian Bureau of Statistics., 2018). Because of the continent's long-term geographic isolation, much of Australia's biota is unique. About 85% of flowering plants, 84% of mammals, more than 45% of birds, and 89% of in-shore, temperate-zone fish are endemic (Department of the Environment and Energy, 2018). It is the fifth country to have very specific vegetation and has approximately 22,000 kinds of plants and 90% don't appear anywhere else. Acacia trees and eucalyptus belong to the Australian vegetation, and there are approximately 600 kinds of those plants. It is home for more than 80% of terrestrial species of animals.

The wildfire is common in many areas but this time the Australian bushfire that happened in the June 2019 and got worsen in the late December and early January 2020 had a disastrous move over the country. The reports have said that totally 7.3 million hectares of lands have been burned and that took the life of about half a million animals and around 30 people have lost their life including the fire fighters in the six states of Australia. It is considered to be hazardous than the amazon wildfire that happened in the year 2019. The other painful part of the bushfire is the air pollution the country faced.

The air pollution level in this January is the worst phase of pollution the country has ever faced. The climate activists were claiming that the smoke from bushfire can travel great distances that could reach Antarctic and led to hazardous air quality

(UN Environmental Organisation, 2020). The incident grabbed the attention of the experts, politicians, climate activists and general public from all over the globe. People have started to express their views on everything that happen around the world. It gets expressed with the source of social media accounts which is connected globally. Wherever any natural calamities happens people from everywhere express their views and emotions like sorrow and their support to the affected country and sadness for the people died in the calamities.

Nowadays people use the social media for crowd funding to donate the affected people. In this incident the most of the people have expressed their views and the highly noticed term is the climate change is real and about global warming. The others were expressing their sorrow, worries and few were questioning the officials of Australia about the actions they have taken to settle down the problems happening there. Twitter is one of the social media account used by people all over the world. As of 2018, Twitter had more than 321 million monthly active users and approximately and 500 million tweets a day (Twitter, 2020); that is half of the global population are active in twitter with numerous hash tags, because people are independent in expressing their views and there are no restrictions and hesitation.

Sentiment analysis is concerned with the expression of opinions and emotions of each tweet. People make use of emoji's, smileys and stickers to express their emotions rather than the usage of words. Sentiment analysis of a person's text or emoji's can measure the attitude towards an event or a person. The products are reviewed using emoji's. Sentimental analysis is classified into two types, they are objective and feature based. Objective type of sentimental analysis explores the text which express some emotions such as hatred, love etc. Feature based sentimental analysis is to review movies (Lexalytics, 2020). Various techniques such as symbolic and machine learning are used to analyse the sentiment from twitter data. In this study, the people's views, opinion and emotions behind the Australian bushfire is extracted and analyzed through tweets. This study is the sentimental analysis of the people`s tweets about the recent Australia bushfire. In which we have selected the hash tags related to the incident and analyzed it using programming language.

Research Methodology

In this study, R programming language was used to analyze the opinions, emotions and sentiments behind the tweets. R is a software for data analysis and statistical computing; the R library "twitteR" provides access to Twitter Application Programming Interface (API). With the use of twitteR package, the package that has a set of predefined functions in well-defined format to solve specific questions, tweets were extracted and analysed for sentiment classification and scoring. The study involved extraction of tweets from twitter with hash tag related to Australian bushfire and only the text is extracted from those tweets. The extracted text from the tweets is inserted into text mining library of R "tm" Package.

Hashtags included in the study and number of posts are as follows:

#bushfires	–	27,897
#bushfireaustralia	-	15,811
#bushfirereason	-	8,678
#bushfireappeal	-	8,392
#bushfirecrisis	-	285
#bushfiretanker	-	166

Data Collection

With the help of twitteR package, it was made possible to fetch the data from twitter API, directly into R programming interface. The extracted data contain information about the tweets, date and time of tweeting, Profile name, details about retweet and favourites etc. From this data only tweets were extracted for analysis since it only had the required text to perform sentiment analysis. It is done through the process of Data pre-processing.

Data Pre-processing

The data extracted from the tweets contains not only text but also punctuation, symbols, tab spaces, blank spaces, links, punctuations, user mentions and emoticons, date and time of creation, Profile name, details about retweet and

favourites etc. The following shows how the data will change at each step of pre-processing:

First step: Pre-processing is to convert all the text in to uniform case, (i.e.) lower case.

Second step: To remove of all user mentions (name of users prefixed with "@") and retweets.

Third step: Removal of all punctuations, blank and tab spaces both at the beginning and end of the text. Then the links attached to the text are removed and emoticons used by the users to better express his emotions are also removed.

Fourth step: Removal of all helping verbs, auxiliary verbs, linking verbs and conduction words and stemming is done for each word.

Finally, plain text data is available for individual users and it is put into sentimental analysis and accurate results are obtained.

Results & Discussion - Sentiment Analysis

Sentiment analysis has the ability to extract insights from social data and to gain overall view of the wider public opinion. This practice is being widely adopted by organisations across the world for understanding consumers mind and to make effective decisions. A word cloud is created to represent all the words that were repeated at least 20 times; the phrases that are very popular among the users are identified. The sentiment bearing phrases of each tweets are classified into eight sentiments namely anger, anticipation, disgust, fear, joy, sadness, surprise and trust with the help of Natural Language Processing packages. With the classification of tweets being completed scores for each sentiment is calculated.

From the figure 1 it can be noted through some phrases like 'Climate Change', 'Disaster', 'Unprecedented crisis', 'logger', 'Koala at risk', users predominantly talked / discussed about how human society is to be held responsible for this loss, and many guilt feelings and anger emanating from the discussion room about how human' unsustainable behavior is the reason for the loss of millions of native species, and injuring thousands of koalas. Many were also found to be talking in apocalyptic terms that they are in Armageddon; there were also voices of solidarity, pouring support for help Bushfire victims and devastated animal population.
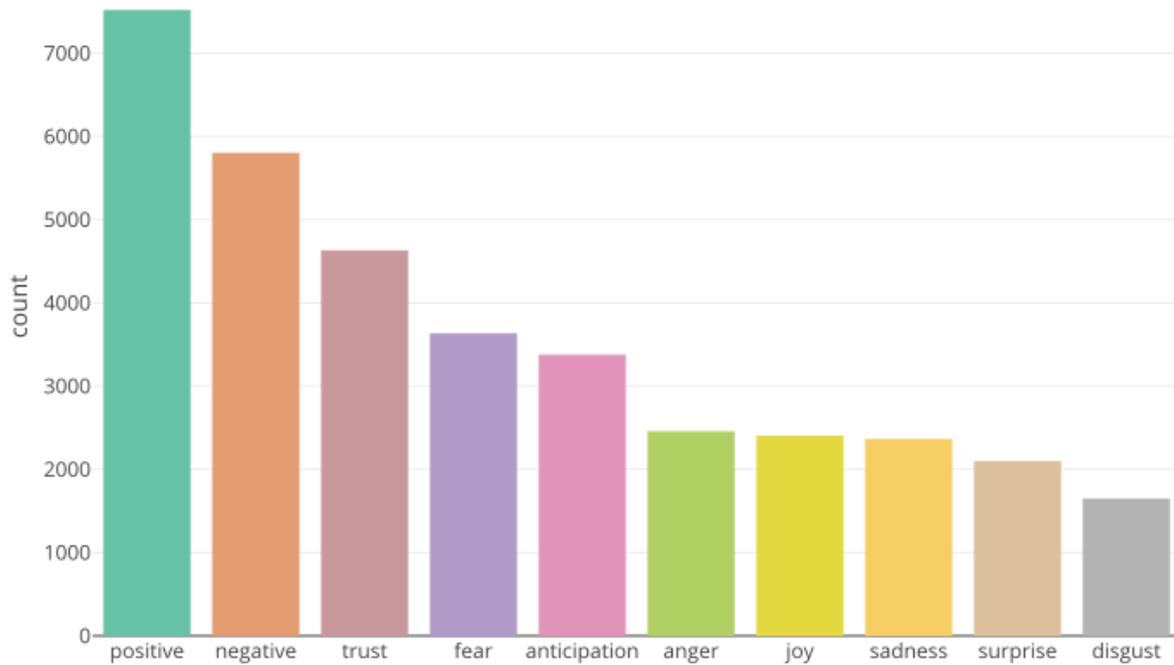
Figure 1 – Word cloud of Tweets

The sentimental analysis were done on Australian bushfire tweets like bushfires, bush fire Australia, bushfire appeal of about 61,000 tweets for a week during the end of January 2020, the time when the Australian bushfires were settling down due to the rain. The collected tweets were analyzed through R programming which showed the positive and negative emotions people expressed about the incident. The positive emotions are trust, anticipation, joy, surprise and the negative emotions like anger, sadness, disgust and fear. The analyzed data is shown in the graph which denotes that positive emotions are expressed more than the negative emotions. This is because mourns of the wildlife was shedding after the rainfall in Australia. The other factors which added to the joy and hope of Australia despite the climate change and the global warming were the help the country received from variety of organizations and general public from various parts of the globe and the intensive work of the firefighters of Australia who were saving many lives from the bushfire and adopted many of them. The number of tweets and the change in the emotions of the people tells us the awareness people hold towards the incident.

Figure 2 – Sentiment score

Conclusion

The sentimental analysis of the Australian bushfire has shown us the kind of reactions of people towards that incident. It shows us that there are many points to note about how social media paves the way to express our emotions in a common platform. The incident happened in a place that almost had the features of an island and has gathered much attention from various parts of the globe. Here the emotions are not the only aspect that has to be shared all over but also the condition of our globe, the climate change and the global warming which is hitting its peak that needs our attention and concern too.

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