Project Report

Topic : Web Based Dashboard for COVID-19 Twitter Sentiment Analysis

Category : Artificial Intelligence

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CONTENTS

1. INTRODUCTION

1.1 Overview

As governments and organizations continue to work towards COVID-19 and stem the growing humanitarian toll it is exacting, the economic effects are also beginning to be felt. We can track sentiment to gauge how people's expectations, incomes, spending, and behaviors change throughout the crisis across the country over time and also predict their state if the lockdown is extended.

Thus, the idea is to create a dashboard for twitter sentiment analysis to get an idea of the public sentiment and take appropriate steps in decision making.

1.2 Purpose

Social network analysis is the study of people's interactions and communications on different topics and nowadays it has received more attention. Millions of people give their opinion of different topics on a daily basis on social medias like Twitter. It has many applications in different areas of research from social science to business. Twitter nowadays is one of the popular social media which according to the statistician currently has over 300 million accounts. Twitter is the rich source to learn about people's opinion and sentimental analysis.

The objective is to support the public decision maker in the decision process in order to facilitate the growth and innovation aiming at improving the daily life of the community. In this way, the public institution will have the opportunity to acquire, identify, organize, and analyze the "noise" about a public sector and will highlight the quantitative and qualitative aspects that determine the positive or negative sentiment image for the qualification/requalification of its activities.

2. LITERATURE SURVEY

2.1 Existing Problem

Because of the ongoing COVID-19 pandemic, the economic and social condition of every affected country has taken a hit. The government and public administrations are taking measures to mitigate the spread of the virus by announcing lockdowns and introducing policies. Hence, it is crucial to get the public sentiment to retrospect the consequences of the actions and measures and in some cases prevent any radical reactions from the public.

Hence, the need is to collect the feedback of the policies and measures taken by the administration and gauge them according to the needs of the people. Usually this is one through surveys which require time and they cover only a portion of the masses. Since these days people now turn to social media like twitter to express their opinions , all these data and public opinion stays unused in public administration.

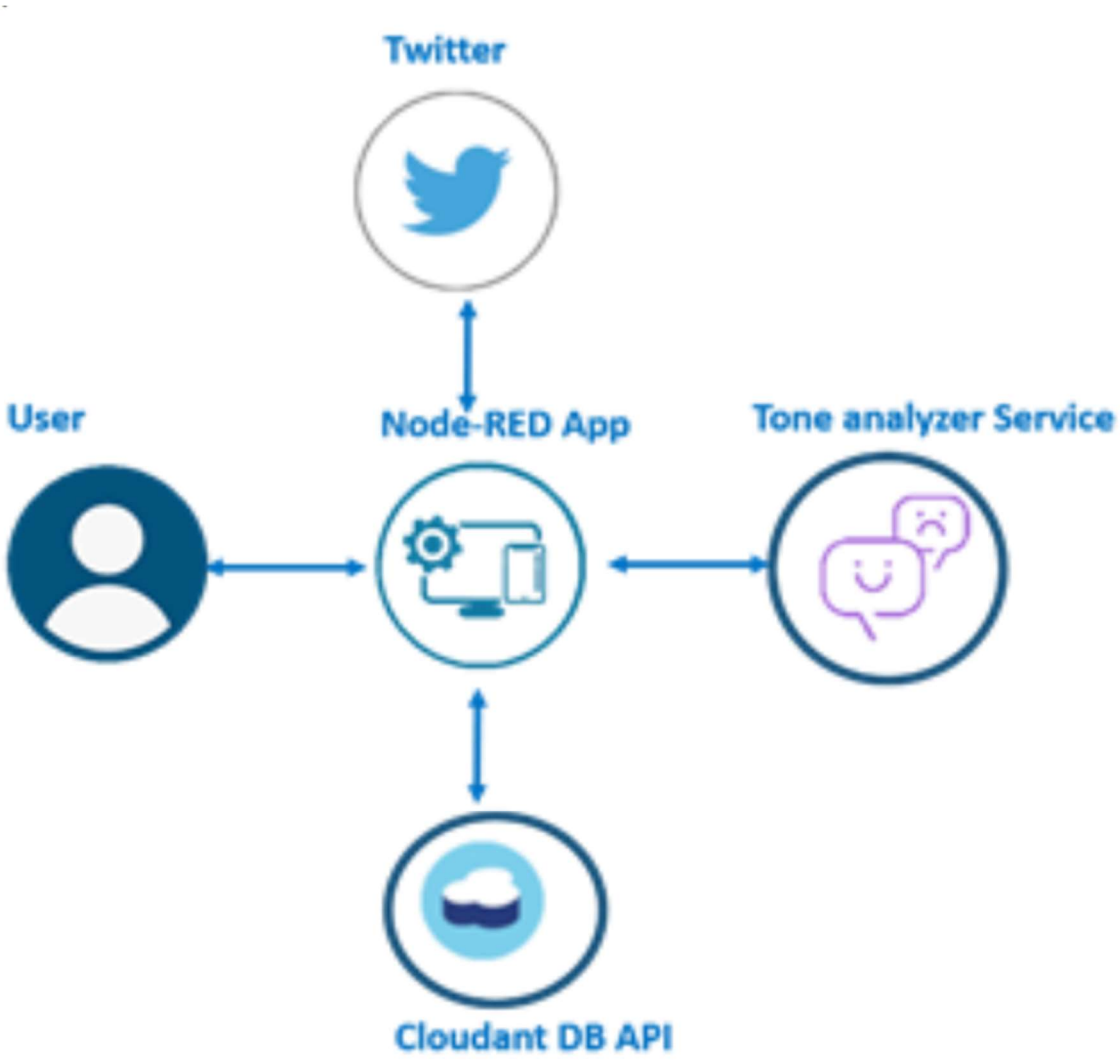
2.2 Proposed Solution

In this Project, our server application subscribes to a Twitter feed as configured by the user. Each tweet received will be analyzed for emotional tone and sentiment, all data is stored in a Cloudant database, with the opportunity to store historical data as well. The resulting analysis is presented in a Node-Red based Web UI as a series of graphs and charts

- Tweets are pushed out by Twitter based on Hashtag.
- The Watson Tone Analyzer Service /Sentiment node performs an analysis of
- sentiment and emotional tone.
- Tweets and metadata are stored in Cloudant Database.
- The Web UI displays charts and graphs.

3. THEORETICAL ANALYSIS

3.1 Block Diagram



3.2 Software Designing

1. **Subscribe to a twitter feed**
   - Creating and using a twitter developer account to get access to fetch tweets.
   - Get tweets based on hashtag (#) or following an account (@).
2. **Parse the tweet**
   - Remove URL from the tweet as it is unnecessary
3. **Get the sentiment score of the tweet**
   - Using the Sentiment Node in Node Red service, pass the tweet through it to get the sentiment score
4. **Classify the tweets**
   - If the sentiment score is greater than or equal to 2, mark the tweet as positive else negative
5. **Create Dashboard**
   - Using node-red dashboard, plot the chart showing the public sentiment regarding a particular hashtag

4. EXPERIMENTAL INVESTIGATIONS

The sentiment node performs well as given below:

{
  "tweet": "Government urged to give nurseries testing kits after rapid rise in coronavirus cases across the UK #lockdown… https://t.co/LEuOeSElG0",
 "sentiment": 1
 "tone": Sadness
}

{
 "tweet": "RT @LeahButlerSmith: Thoroughly Embarrassing actually. That anyone still believes the lies, misinformation, corrupted data and fraudulent…",
 "sentiment": -11
 "tone": Disgust
}

{
 "tweet": "#EastDevon has 14th lowest #COVID19 infection rate in England. Another #lockdown will kill my coastal town economic… https://t.co/suKMbI646e",
 "sentiment": -6
 "tone": Sadness
}

{
 "tweet": "RT @Rich_VC: Fantastic video put together by @Orchard_live celebrating the great work produced by the Welsh Arts sector during these past m…",
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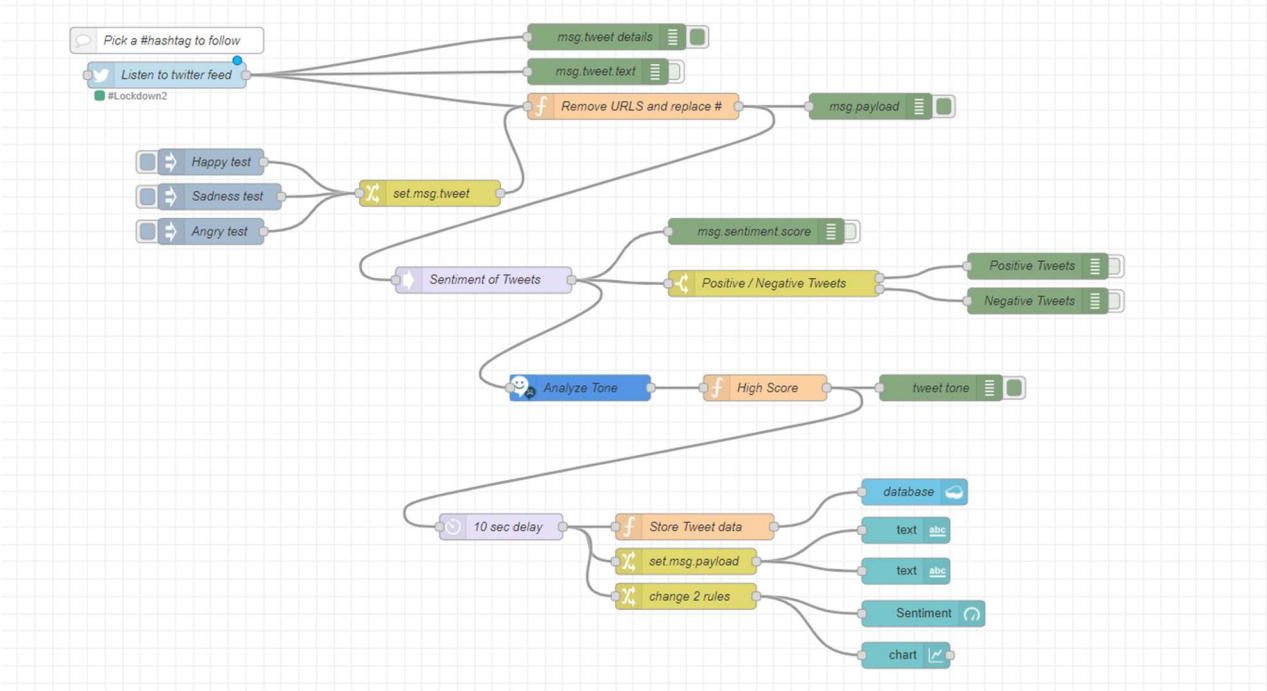
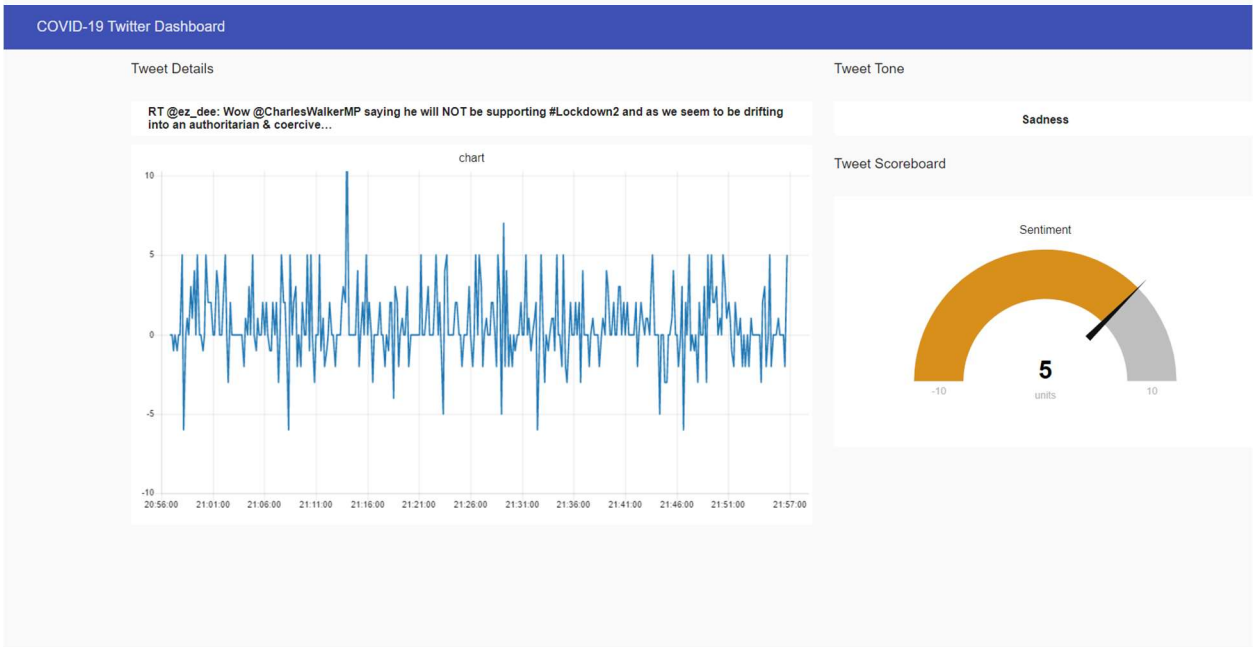
 "tone": Joy}

5. FLOWCHART


Pick a #hashtag to follow
Listen to twitter feed
#Lockdown2
msg.tweet details
msg.tweet.text
Remove URLS and replace #
msg.payload
Happy test
Sadness test
Angry test
set.msg.tweet
msg.sentiment.score
Sentiment of Tweets
Positive / Negative Tweets
Positive Tweets
Negative Tweets
Analyze Tone
High Score
tweet tone
database
10 sec delay
Store Tweet data
text
set.msg.payload
text
change 2 rules
Sentiment
chart

6. RESULT


COVID-19 Twitter Dashboard
Tweet Details
RT @liarpoliticians: The "lockdown" is NOTHING to do with #coronavirus, it is part of the plan to smash the will of people and the UK econo…
chart
10
5
0
-5
-10
20:55:00
21:00:00
21:05:00
21:10:00
21:15:00
21:20:00
21:25:00
21:30:00
21:35:00
21:40:00
21:45:00
21:50:00
21:56:00
Tweet Tone
Sadness
Tweet Scoreboard
Sentiment
0
-10
units
10


COVID-19 Twitter Dashboard
Tweet Details
RT @ez_dee: Wow @CharlesWalkerMP saying he will NOT be supporting #Lockdown2 and as we seem to be drifting into an authoritarian & coercive…
chart
10
5
0
-5
-10
20:56:00
21:01:00
21:06:00
21:11:00
21:16:00
21:21:00
21:26:00
21:31:00
21:36:00
21:41:00
21:46:00
21:51:00
21:57:00
Tweet Tone
Sadness
Tweet Scoreboard
Sentiment
5
-10
units
10

7. ADVANTAGES & DISADVANTAGES

Advantages:

- This project provides visualization of the overall public sentiment regarding a given topic
- Looking at the dashboard, the possibilities a future anti-social event can be estimated.
- The tweets are classified as positive and negative based on the sentiment score.

Disadvantages:

- Less accurate. Accuracy depends on Sentiment node.
- Does not state the tone of the tweet.
- Cannot calculate the overall sentiment .User has to rely on the Visualization

8. APPLICATIONS

- For Governments to get speedy feedback about the policies.
- For Companies to see how people like the products or services.
- For Advertisers to see how a particular advertisement is doing.

9. CONCLUSION

As per the requirement, this model classifies the tweets into positive or negative. The dashboard displays the public sentiment in the form of a chart where seeing the graph the government and other organizations can see if the overall sentiment is radical / extreme or neutral and thus draw conclusions and amend the policies likewise. Thus, this is a good mechanism for the governments to see what the citizens think about their decisions.

10. FUTURE SCOPE

This COVID-19 Twitter dashboard offers only binary classification of tweets. More work can be done to express the tone and overall public sentiment. Upper and lower limits for overall sentiment can be set and thus the user can be alarmed about the extreme public reactions.

11. BIBLIOGRAPHY

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2. https://www.ibm.com/academic/
3. https://www.extly.com/docs/autotweetng_joocial/tutorials/how-to-auto-post-from-joomla-to-twitter/apply-for-a-twitter-developer-account/#apply-for-a-developer-account
4. https://node-red.gitbook.io/node-red-twitter/workshop/twitter-credentials-setup
5. https://node-red.gitbook.io/node-red-twitter/workshop/tweet-simple-1
6. https://node-red.gitbook.io/node-red-twitter/workshop/tweet-sentiment
7. https://node-red.gitbook.io/node-red-twitter/more-node-red-flows/tweet-dashboard
8. https://thesmartbridge.com/documents/spsaimldocs/opendashboard.pdf

APPENDIX

A. Source code


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Hash tag \");\n\n// regex from
https://stackoverflow.com/questions/1500260/detect-urls-in-text-with-
javascript\nmsg.payload = newtweet.replace( /(([a-z]+:\\/\\/)?(([a-z0-9\\-]+\\.)+([a-
z]{2}|biz|com|co|edu|gov|info|net|org|ly))(:[0-9]{1,5})?(\\/[a-z0-9_\\-
```

\\.~]+)*(\\/([a-z0-9_\\-\\.]*)(\\?[a-z0-9+_\\-\\.%=&]*)?)?(#[a-zA-Z0-9!$&'()*+.=-_~:@/?]*)?)(\\s+|$)/gi, \"see short URL \");\nreturn msg;",
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    ]
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    "payloadType": "json",
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      [
```

```
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        ]
    ]
},
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