

Sentimental Analysis on voice using AWS Comprehend

G. Satyanarayana
Department of MCA (SCT)
Jain University, Bangalore, India
Satyamtomail1995@gmail.com

Dr. Bhuvana J
Assistant Professor,
Department of MCA
Jain University, Bangalore, India
Bhuvana.j@inurture.co.in

Balamurugan M
Department of CSE
Christ University
Bangalore, India
balamurugan.m@christuniversity.in

Abstract—Sentimental analysis plays an important role in these days because many start-ups have started with user-driven content [1]. Sentiment analysis is an important research area in natural language processing. Natural language processing has a wide range of applications like voice recognition, machine translation, product review, aspect-oriented product analysis, sentiment analysis and text classification etc [2]. This process will improve the business by analyse the emotions of the conversation. In this project author going to perform sentimental analysis using Amazon Comprehend. Amazon Comprehend is a natural language processing (NLP) service that uses machine learning to extract the content of the document. By using this service can extract the unstructured data like images, voice etc. Thus, will identify the emotions of the conversation and give the output whether the conversation is Positive, Negative, Neutral, or Mixed. To perform this author going to use some services from Aws like s3 which is used for the data store, Transcribe which is used for converting the audio to text, Aws Glue is used to generate the metadata from the comprehend file, Aws Comprehend is used to generate the sentiment file from the audio, Lambda is used to trigger from the data store s3, Aws Athena is used to convert text into structured data and finally there is quick sight where he can visualize the data from the given file.

Keywords: Sentimental analysis, NLP, S3, Transcribe, Aws Glue, Aws Comprehend, Lambda, Aws Athena, Quick sight.

I. INTRODUCTION

Now a days knowing the people emotion is very important for the improvement of business and also for the analysis of the business. [7] people will have different opinion on movies, political issues and also on products [8] The capability of detecting the sentiment of the speaker in the audio can serve two basic functions: (i) it can enhance the retrieval of the particular audio in question, thereby, increasing its utility, and (ii) the combined sentiment of a large number of audio on a similar topic can help in establishing the general sentiment. It is important to note that automatic sentiment detection using text is a mature area of research, and significant attention has been given to product reviews, we focus our attention on dual

sentiment detection in videos based on audio and text analysis. Previously there was doing sentiment analysis only on structured data but now a days as the growth of data is increased in the social media is become more so sentiment analysis is performing on unstructured data and it is difficult to extract sentiment in the form of manual analysis is not an easy task.[7] There are different methods to find the sentimental analysis such as Naïve Bayes, super vector machine and also other machine learning technique like supervise and unsupervised learning used for classification of test set. This machine learning technique can provide better results but it will take lot of time to train the data set. [9] Traditional methods will not provide accurate sentiment result to solve real time complexity this is only possible by doing the automation and make the work simple. In this project author is moving to cloud to provide many advantages such as time complexity can perform and also automation by using lambda and so on compare to a manual system and also can perform the automation for converting audio to text and also converting text to accurate sentiment and also provide good security and no one can break the security all the data will be encrypted. They can get the result in the form 4 ways weather the sentiment is positive, negative, neutral and mixed. Author is going to use the cloud services like Identity Access Management (IAM) used for security purpose, AWS Comprehend Is used to generate the sentiment file, AWS Transcribe is used to convert the audio into text, AWS Athena is used to convert file to structured data, AWS Glue is used to generate the metadata, AWS Lambda is used to trigger the audio file from the data store, AWS Quick sight is used to visualize the data from the file. This will help to find the sentiment of the audio and provide the result in the form of dashboards like bar charts so it is easy for people to improve the business. This services will help to reduce the cost when compare with the normal systems and no need of writing code again and again once write and use number of times by using the lambda.

II. LITERATURE SERVEY

A) A Feature based approach for sentimental analysis by using support vector machine:

The authors implemented support vector machine (SVM) for the feature based sentiment analysis. To get the final output the data set should pass through five different phases so it is difficult to perform five phases of each audio will take a lot of time to complete the task and also it is risk to the person who is doing the task [3].

B) Modelling Sentiment Terminologies: Target based polarity phenomena

It is implemented for the content of tweets. Need to apply cleansing technique for the input data before classification process can improve the output. They pointed that instead of using un-aware classification it's better to use subject aware classification for better result. This are the tools is using to cleaning the data Alchemy API, Tweet NLP & NTLK. [4]

C) Multi-Aspect & multi-class based document sentiment analysis of educational data catering accreditation:

The problem with the existing system to identify sentimental analysis such as entity identification, subjectivity detection. This approach was used for educational data mining where we can evaluate the teachers by taking the feedback from the students. Java strings tokenizer was used to divide the reviews into two groups. Stop words removed algorithm is used to remove the special characteristics & some pronouns. They used TF-IDF to represent the data in a numeric form. They implemented two machine learning techniques those are naïve Bayes & SVM were used on pre-processing data. [5]

D) Proposal of automatic estimate evaluation of travelers reviews:

Author evaluated the performance of sum & compared with the dependency search tree results. One-against-one method was used and performed by using scikitlearn3, which is a python package. Thus it can be extended to multiclass classification. They added Super vector machine (SVMs)'s RBF kernel is used. Conducted experiment by using three values A as 5, B as 3, C as 3. A is determined using basic result of machine learning, B is estimation in laxer score, C was an using the dependency tree search. The authors suggested to improve the future work on auto-matic sentiment by machine learning. [6]

III. PROBLEM STATEMENT

Now a days The Data is more important so the need of securing the data became more important so by using Identity Access Management (IAM) in AWS cloud Author can provide security to the data by using IAM the data will be encrypted and it also provide two factor authentication. Reason with going to use with AWS Cloud is the normal

process will not provide the better security such as support vector machine (SVM) and machine learning (ML) process and it can be break by using some algorithms like brute force attacks. As the data increases automation is very important to reduce the work of the machine learning techniques will take lot of time to train the data it will be big problem to use the normal process. Better Integration and scalability is not possible without using the cloud so by using cloud can use all the service and integrate and cost is more to implement as if we need to increase the resources need to use physical systems complexity in the code and difficult to perform the sentimental analysis on voice by using the normal procedure like SVM and Tableau, need copy the sentiment of every audio and can visualize it is difficult if the data is huge.

IV. PROPOSED SYSTEM

In this paper author proposed model for implementing sentimental analysis using AWS Comprehend. Which extract the sentiment from the audio this process involved 3 steps .a) Converting the audio to text using the service AWS Transcribe. B) Converting the text to sentiment by using the AWS Comprehend. C) Generating the metadata of the sentiment data and making the query by using the AWS Glue and AWS Athena and the final process of making the dashboard in the form of bar charts and proposed system having many advantages they are it is scalable and able to increase the resources if needed the resources by using AWS cloud. In this proposed system no need to pay extra money should pay for the resources which we have used and also no need to buy additional license of the tools can write the code once and can use for multiple times due to this can reduce the time complexity of the developer. There won't be security problem in the proposed system because AWS Cloud is providing the security Service like Identity Access Management (IAM) it provide the data in encrypted format and no need to buy data store to store the data separately we have S3 to store the data and by using python we can reduce the complexity to the code and feels flexible to the developers by writing few lines compare to existing system can get the output and can show the output in the form of dashboard like bar chats.

V. SAMPLE DIAGRAM

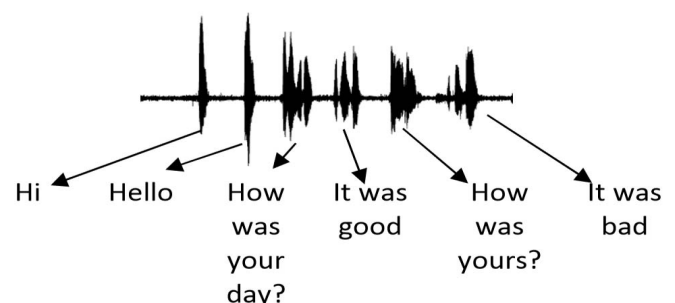


Fig.no:5.1 Sample waveform [10]

VI. FLOW DIAGRAM

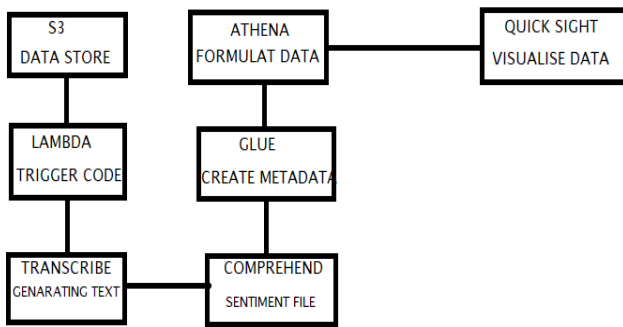


Fig no:6.1 Flow Diagram

Firstly audio file in to the S3 bucket and the writing a code using server less service lambda and trigger the audio file from the data store S3 then generating voice to text using the transcribe and generating the transcribe file in the S3 transcribe bucket. After generating the transcribe file author is going to trigger lambda to generate text to sentiment using the AWS Comprehend that sentiment file will be stored in the Comprehend S3 Bucket.

After generating the comprehend file this output can see by using the browser click on the file and see the output author are going to use AWS Glue to generate metadata from the comprehend file and creating a data base then running with crawler this database will be replicated to AWS Athena to make query, finally author is going with quick sight to make dashboard in the form bar chart so that can see the sentiment of audio author can see in the form of bar chart.

VII. METHODOLOGY

In this proposed system firstly going to uploading a audio file in to the bucket and the writing a code using server less service lambda and trigger the audio file from the data store S3 then generating voice to text using the transcribe and generating the transcribe file in the S3 transcribe bucket. After generating the transcribe file we are going to trigger lambda to generate text to sentiment using the AWS Comprehend that sentiment file will be stored in the Comprehend S3 Bucket.

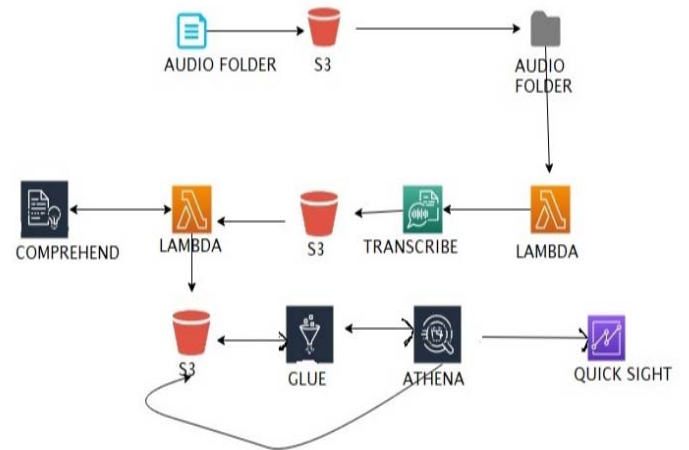


Fig no:6.1 Architecture

After generating the comprehend file we are going to use AWS Glue to generate metadata from the comprehend file and creating a data base then running with crawler this database will be replicated to AWS Athena to make query, finally we are going with quick sight to make dashboard in the form bar chart so that can see the sentiment of audio we can see in the form of bar chart.

VIII. IMPLEMENTATION

Transcribe file from the audio is generated to S3 bucket use browser for the output of the transcribe from JSON file

```

{"jobName":"c7501Feb-510a-4d0b-8305-55516fab7e3f","accountID":"25594921210","results":{"transcripts":{"transcript":"Hi, jungle. Hi, jungle. Hi, jungle."},"items":[{"start_time":"0.34","end_time":"0.81","alternatives":[{"confidence":"0.7025","content":"Hi"},"type":"pronunciation"}],"alternatives":[{"confidence":"0.0000","content":"."},"type":"punctuation"}],"start_time":"0.82","end_time":"1.45","alternatives":[{"confidence":"0.9999","content":"jungle"},"type":"pronunciation"}],"alternatives":[{"confidence":"0.0000","content":"."},"type":"punctuation"}],"start_time":"1.94","end_time":"2.43","alternatives":[{"confidence":"0.7069","content":"Hi"},"type":"pronunciation"}],"start_time":"2.43","end_time":"2.80","alternatives":[{"confidence":"0.9979","content":"jungle"},"type":"pronunciation"}],"alternatives":[{"confidence":"0.0000","content":"."},"type":"punctuation"}],"start_time":"3.74","end_time":"4.13","alternatives":[{"confidence":"0.7762","content":"Hi"},"type":"pronunciation"}],"alternatives":[{"confidence":"0.0000","content":"."},"type":"punctuation"}],"start_time":"4.13","end_time":"4.75","alternatives":[{"confidence":"0.9977","content":"jungle"},"type":"pronunciation"}],"alternatives":[{"confidence":"0.0000","content":"."},"type":"punctuation"}]"},"status":"COMPLETED"}
    
```

Fig no: 8.1 Generating transcribe file

AWS Comprehend file is generated to the S3 bucket should go and browse the JSON file generated.

```

{"Sentiment":"NEUTRAL","SentimentScore":{"Positive":0.12091613560924993,"Negative":0.006757408306508423,"Neutral":0.86702112030410767,"Mixed":0.005365197555717945}}
    
```

Fig no: 8.2 Generating the Sentiment file

IX. RESULT

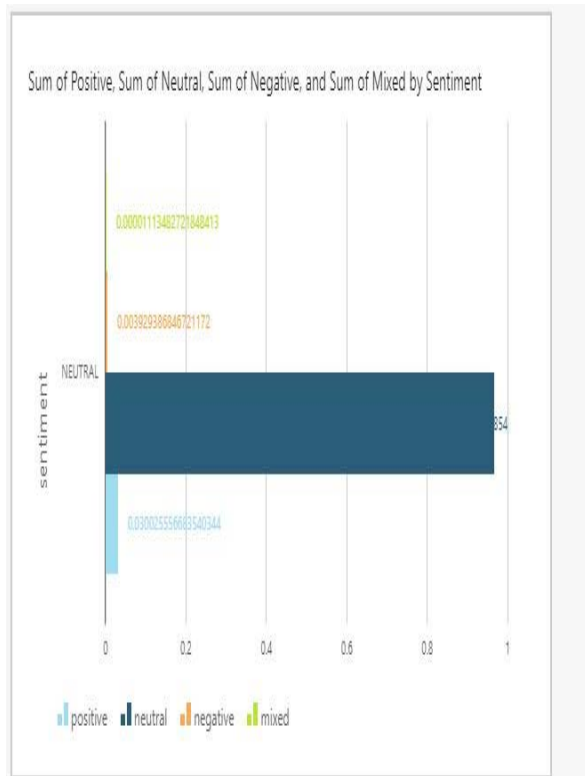


Fig no: 9.1 Bar chart of audio

X. CONCLUSION&FUTURE WORK

Collecting the audio files and finding the sentiment is used for the improvement of business as well they can analysis the business performance. To find sentiment result in this proposed system author is used some aws services like Identity Access management is used for providing the security to the files. S3 is a data store where the author will upload the audio file and from that audio file author can generate the transcribe file by using the service AWS Transcribe. This application can be used in to analyze the various emotions of people in different environment such as political campaigns, customer feedbacks, social media and many.

XI. REFERENCE

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