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Summarizing Team Meetings

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Abstract: *In this paper, we have developed a web and desktop app to provide summary of the online meetings. One of the very popular IT applications is online teaching. At the start of 2020, we faced the largest crisis of the 21st century – The COVID-19 pandemic. This generation eventually found a way to get the job done by introducing automation in every other aspect of life. After the hit of the pandemic, we have encountered a rise in video conferencing tools for daily communications. The communications ranging from online meetups, business meets, college lectures, , almost everything got hosted over to the internet. In the work from home scenario prevailing over years and with hybrid working system, most official meetings have been conducted virtually. While some application provide us with the transcript while conducting the meeting but does not summarize the meeting. In fact, the data collected from employees of all domains, show that people often miss important points because they find taking minutes of those meetings a time-consuming, distracting, and really boring task.. So there arises the need for automatic Text Summarization.*

Key Words: *Summarization, Abstractive, Natural language processing, Transcription, Automatic Text Summarizer.*

I. INTRODUCTION

Due to the pandemic, most of the offices started their work online resulting in all the operations such as conducting meetings online which in turn made creating reports of meeting manually which lead to improper reports sometimes creating a very huge report which creates apathy of the reader. So the main concern in creating the reports are creating a specified short content and including only the crucial content which could be achieved by the STM. As most of the meetings are being conducted online various challenges also occur while taking notes or summarizing it. E.g. Network issue, Audibility issue etc. The main focus of the organizer should not be on taking notes of everything but instead be on being more involved in the meet. So to overcome this problem we can utilize natural language processing to summarize the meeting. We can either summarize completely or give auto suggestions to the organizer to fill in certain details or gaps (which can provide more accuracy in the minutes of meetings).

Meeting minutes are notes that are recorded during a meeting. They highlight the key issues that are discussed, motions proposed or voted on, and activities to be undertaken. The minutes of a meeting are usually taken by a designated member of the group. Their task is to provide an accurate record of what transpired during the meeting. As most of the meetings are being conducted online various challenges also occur while taking notes or summarizing it. The main focus of the organizer should not be on taking notes of everything but instead be on being more involved in the meet. So to overcome this problem we can utilize natural language processing to summarize the meeting.At present, most of the conventional education forms are becoming not being suitable for requirements of social progress and educational development and not being able to catch up with the changes of learning demand in time, thus computer networks have brought opportunities for it[2].

The main aim of this project is to make a automated speech to text converter and avoid the human interference of making notes and making it more easy and reliable for meetings to get the precise and reduced summarize of the meeting. With summarizing we aim to provide different features for summarizing any document using the file or web-link of the particular content. This helps in summarizing abstracts, college notes and different necessary documents.It is very difficult for human beings to manually extract the summary of a large documents of text. There are plenty of text material available on the internet. So there is a problem of searching for relevant documents from the number of documents available, and absorbing relevant information from it.In order to solve the above two problems, the automatic text summarization is very much necessary[1].

In this paper we present the system for automatic text summarization which uses natural language processing algorithms in order to generate short summary. It supports text as well as speech content for generating summaries. Our desktop application and web application provides the summary of the transcript as well as non transcript files.Automatic summarization is a renowned approach which is used to reduce a document to its main ideas.[7]

II. RELATED WORK

Mega Satish et al. [2021] provide an insight into Text summarization which is the process of making a synopsis from a given text document while keeping the important information and meaning of it. Automatic summarization has become an essential method for accurately locating significant information in vast amounts of text in a short amount of time and with

minimal effort. In this project, we propose to implement a web application that can summarize a text or a Wikipedia link[3].

Dr. Annapurna P Patil et al. [2014] aim to design an algorithm that can summarize a document by extracting key text and attempting to modify this extraction using a thesaurus. Our main goal is to reduce a given body of text to a fraction of its size, maintaining coherence and semantics.Automatic summarization is the process of condensing textual content into a concise form for easy digestion by humans, using a computer program.[6].

Samrat Babar [2013] discussed in his paper that there are plenty of text material available on the internet. So there is a problem of searching for relevant documents from the number of documents available, and absorbing relevant information from it.In order to solve the above two problems, the automatic text summarization is very much necessary.Text summarization is the process of identifying the most important meaningful information in a document or set of related documents and compressing them into a shorter version preserving its overall meanings[1].

N. Moratanch et al. [2017] discussed in their paper that most of the conventional education forms are becoming not being suitable for requirements of social progress and educational development and not being able to catch up with the changes of learning demand in time, thus computer networks have brought opportunities for it. However, in traditional web-based e-learning mode, system construction and maintenance are located in interior of educational institutions or enterprises, which results in a lot of problems existed, such as a lot of investment needed, but without capital In a recent advance, the significance of text summarization accomplishes more attention due to data inundation on the web. Hence this information overwhelms yields in the big requirement for more reliable and capable progressive text summarizer[4].

Table no 1 : *Summary of Related Work*

SN	Paper	Advantages and Disadvantages
1.	Text Summarizer, Mega Satish et. al., 2021.	Advantages: Describes different types of summarization that a user can compare the summarized text and get the desired lines of summarized text . Disadvantages: Does not provides the option for speech to summarize directly .
2.	Automatic Text Summarizer, Dr. Annapurna Patil et.al., 2014.	Advantages: Provides detailed summarization and both types of summarization is available i.e. extractive as well as Abstractive . Disadvantages: Efficiency and the speed of extraction and abstraction is quite slow.
3.	Text Summarization: An Overview , Samrat Babar, 2013	Advantages: The quality of summary is acceptable as the document focuses on the extractive summarization and explain s the process of abstractive and extractive and explains the drawback of abstractive summarization . Disadvantages: Does not focuses on the abstractive summarization.
4.	An A Survey on Extractive Text Summarization , N. Moratanch et.al., 2017	Advantages: Large set of training data improves the sentence selection for summary Identifies correct features and provides specific sentences and groups terms appropriately into segments. Disadvantages: Only a overview of extractive summarization is proposed.

III. PROPOSED WORK

As most of the meetings are being conducted online various challenges also occur while taking notes or summarizing it. E.g. Network issue, Audibility issue etc. The main focus of the organizer should not be on taking notes of everything but instead be on being more involved in the meet. So to overcome this problem we can utilize natural language processing to summarize the meeting. Machine learning is one of the fastest growing domains in computer science and this problem statement is giving us an opportunity to deep dive into one of the most important section of machine learning i.e. Natural Language processing. Our system provides summary through speech as well as text. Most Conferencing Apps provide the feature of live captions which can be later downloaded but in case it is not available we can use the Python Speech Recognition and pyAudio library to convert so. After that comes the most challenging aspect of the problem statement i.e., providing a summary or minutes of meeting of the meeting.

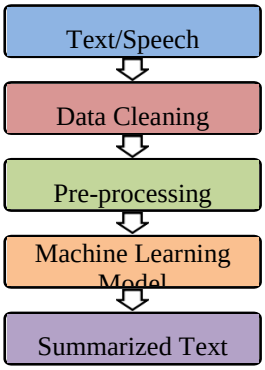

Fig.1. Block diagram of the proposed system and its flow for generating summarized text.

IV.WORKFLOW OF THE SYSTEM

Our system includes a web application as well as desktop application.

Web Application:

The web application includes transcript of the text as well as transcript of the speech. While providing the transcription from speech file it summarizes after converting it from speech to text. For receiving the output as summarized text the user first needs to first select the option between the text summarization and speech summarization. After selecting one of the option the user needs to upload the file to be summarized. After uploading it successfully, the text/speech will be send to the back end and the output file will be downloaded. The output file contains the summarized text.

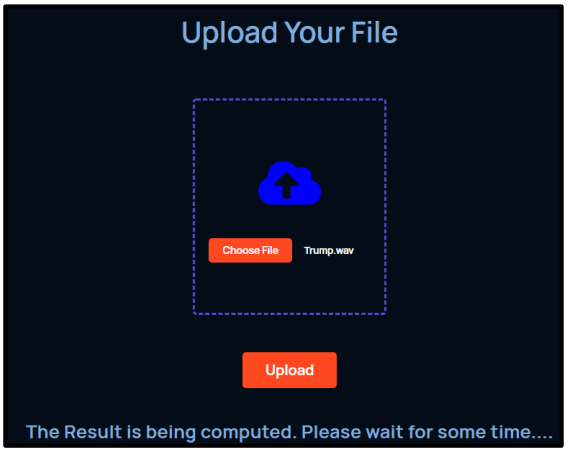

Fig.2. Selecting the file from the system and uploading the file for summarization.

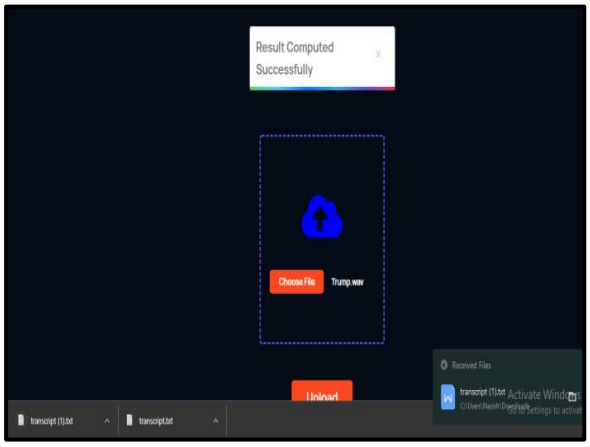

Fig.3. After result computation the summarized text will be downloaded in the form of text file.

Desktop Application:

The desktop application includes summarization using different packages and different features of transcription. It accepts content for summarization through file uploading, URL of any websites and also by pasting the content inside the text box. While uploading the URL of a website one can get all the text contained in that specific page and also summarize it and get the results.

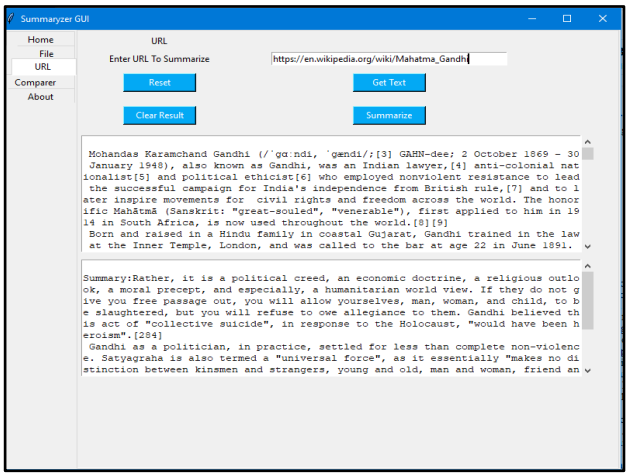

Fig.4. Getting text from the URL and summarizing its content.

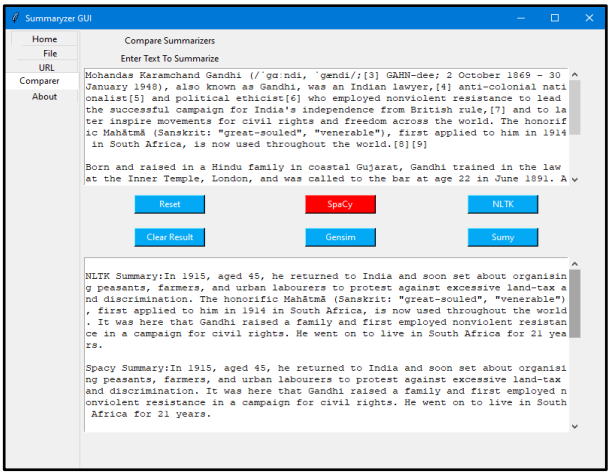

Fig.5. Comparer used for getting summaries as per the requirement.

The desktop application also has the feature of getting the summarized basis by comparing different results on based of different packages used in the back end. The results from one another on the basis of its size i.e. the number the lines in the result will be increased or decreased on the basis of different packages. This helps one in getting short summaries if needed for some purpose or else getting long summaries as per their need.

So the system basically provides all the options that a user needs and can have all the options from where the user wants to have the text summarized whether may it be a file or a link or the text paragraph itself.User has multiple options to choose between the different comparer and get the best summarized text for themselves. Each comparer gives the accurate and precise summarized text based on the library and methods used in it.

V.CONCLUSION

The output of our application/system is making the minutes of the meetings and also taking care of the important points and summarizing the text which is happened in all over the meeting and making it summarize of to the 30% of the actual text. The applications used the languages and algorithms which are used in our applications are specifically that are specifically based on this context. One of the important points while making a notes for the minutes of meeting is that the person should be actually very much attentive and should be very fast or take care of all the points said in the meeting. But as we know that humans make mistake and therefore we have created such a system which could be very much. As most of the meetings are being conducted online various challenges also occur while taking notes or summarizing it. E.g. Network issue, Audibility issue etc. The main focus of the organizer should not be on taking notes of everything but instead be on being more involved in the meet. So to overcome this problem we can utilize natural language processing to summarize the meeting. Application created is free of use and easy to handle and it is a very light weight program also we will try to count the number of the attendees which were present during the meeting and also the duration for much time the meeting was being conducted.

VI.FUTURE SCOPE

While transcript of the speech file has to be manually uploaded, if can be updated further such that it converts speech-to-text in real time and provide summary. User data can be collected to rank which library is providing better summaries according to them. In this way, performance of the libraries can be easily evaluated. The back end API's can be directly integrated into a mobile first application for summarizing textual data.

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