

Virtual Sense: An auto email downloading and news reading system for visually impaired people.

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Abstract:-

Internet has become a very important factor in our day to day life. It is a wide media for communication and exchange of ideas for people staying in any nook and corner of the world. In this paper an idea is proposed to develop a speech interactive system to provide web application services. The main aim is to provide these services to the special ones who are unable to make use of the current system so efficiently. In this proposed work the main focus is on the web applications. It is tedious for the disabled people who are unable to access internet, this system will help them to download news, or even access their mails through speech. The idea is to incorporate several applications like Email Reader/Sender, News, Reader, Web Content, Blog, RSS Reader, Local System File Reader, Text/Document Reader, and Voice Command System. The proposed system provides access to these applications. So that they can be used by disabled people without the use of the hands to develop an interface between the computer and the user. This is an attempt to develop web application through speech interaction.

Keywords- JSAPI, Speech Recognition, Web Applications, Text to Speech, Speech to Text.

1. Introduction:-

With the advancement in technology and the enhancement of the World Wide Web, information of all games has reached the doorstep of people all over the world. People can learn anything and access news from all over the world sitting right at their homes through the Internet. However, the visually handicapped people are deprived of this benefit. The National Census of India has estimated around 21.9 million disabled people in the country [3]. Out of which more than 15 million people in India are blind. This is considered to be the highest among all other disabilities. Three out of every five disabled children in the age group of 0-9 years have been reported to be visually impaired in India [12]. Due to their inability in accessing information from written text documents, blind people face tremendous difficulties in accessing

information through web. Thus, in order to provide proper information access and to bridge the communication gap between the visually impaired and the sighted community, the need to build some advance technologically supported systems are utterly essential. Visually impaired people will also wish to handle mouse and keyboard, email or any internet related work independently. This is the main objective of our proposed work. We are providing a speech interactive system which will work according to the user, but just by SPEECH. As many speech enabled system are available in the market with Operating System, Keyboard, Mouse control but the proposed system will go a way beyond this and will aim to provide web applications using RSS Aggregator (Rich Site Summary). Taking into consideration the growing demand for speech enabled system this proposed work will help tremendously to access web. The user will say a command through the microphone, this command will be converted into text with the help of JSAPI (Java Speech Application Programming Interface), then command.

2. Motivation :-

Web pages are almost always specifically designed for sighted people. The main aim of web page designers is to convey information to Web surfers in a manner that is convenient. However such organization of a page is not necessarily appropriate for a blind person. The main motivation of the architecture is to address

this issue.

The objective of designing interactive speech based system is to develop a framework, with the required toolset, to enable disabled people to use internet. Output should be in Speech.

3. Previous Work:-

Previously various software such as Speakonia, CoolSpeech, Dragon-Naturally speaking, ReadPlease, e-speaking were designed to perform limited features like Speech Input method, Voice Feedback, Text Extraction and Filtering, Text to speech.

Proposed System Architecture :-

Block diagram shown in the fig.1 describes the overall architecture of proposed system:-

It consists of 3 modules:-

A] TTS engine :-

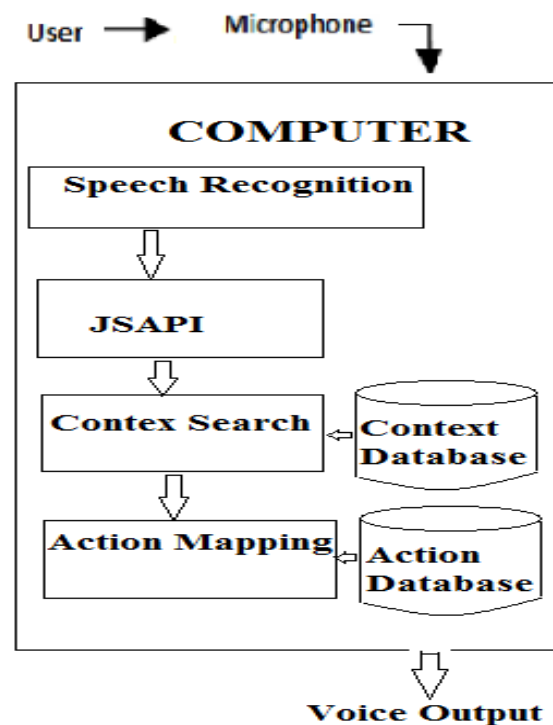
User gives speech command through microphone. Microphone processes that voice command to speech recognition and synthesis system which further will convert voice signal to a sequence of words in the form of digital data. A text-to-speech (TTS) engine is at the core of the speech output generation module. It is converts strings of text to their corresponding human voice equivalent. TTS (Text to speech engine) interacts with hardware. The process of generating human speech from written text is called speech synthesis. The process of converting human speech to words is called speech recognition.

B] JSAPI:-

respective voice commands to them. Using advanced Robot API, the system would generate mouse, keyboard events.

C] NanoXML Parser:-

XML is the extensible mark-up language, which provides a way to mark up text in a structured document. The NanoXML was first released in April 2000 as a spin-off project of the abstract user interface toolkit. It is very small and reasonably fast for xml documents and also it provides the facility of easy to use. Because of its small size, people started to use NanoXML for embedded systems (KVM, J2ME)



This is done with the help of JSAPI. JSAPI is an interface between applications and speech engine. JSAPI provides an API for both speech synthesis and recognition. We maintain the databases of commands and context. According to the commands given by the user actions are mapped to those command. And actions are performed according to the commands as mention in the action database. System will also allow the user to create new actions and map

Fig.1:- System Architecture

Using this system we can access our emails, we get the updates through news, surf internet and access the contents, and can read the various documents

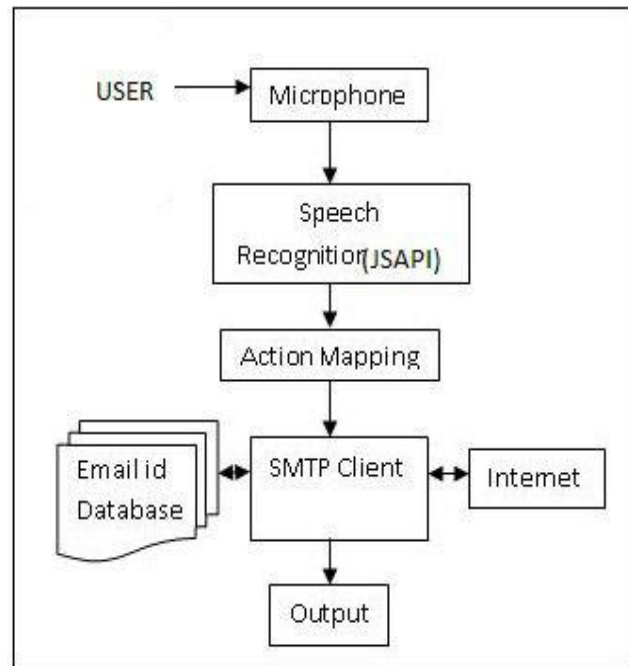


Fig. 2 : Auto email downloader.

1] Auto E-mail downloading system:-

User can access his email account with speech. Here, user will authenticate himself by specifying his credentials i. e. username and password. The voice command given by user will be first converted into textual format through speech to text conversion. This textual command is recongnized by system. System will access the server, download the inbox. And it will read out the received mails i.e. text to speech conversion. Email is parsed before reading to user. The document structure of the email can contain various elements like images, emoticons,links etc. These elements will be dropped by parser i.e. parser extracts the text ,reorganize it and only important information will read out to user. Commands like select mail, open mail, read mail, select next mail, delete mail can be given to system. Also templates can be sent to users through voice command.

2] RSS aggregator:-

RSS stands for Rich Site Summary. It is also called as "feeds","web feeds" or channels. RSS feed can be read by using software RSS aggregator. RSS aggregator automatically accesses RSS feeds of websites you want to have updates of. It helps users to keep their favourite websites in automated manner. These feeds contain date, title, link and description. RSS information is kept into a file on the website and is coded into XML script. User will specify the URL of website through voice command. System will access the desired web page. Then it will download th RSS feed file which is in the XML script. This file will be parsed using nanoXML parser which acts like RSSparser. Then system will read out new feeds to the user.

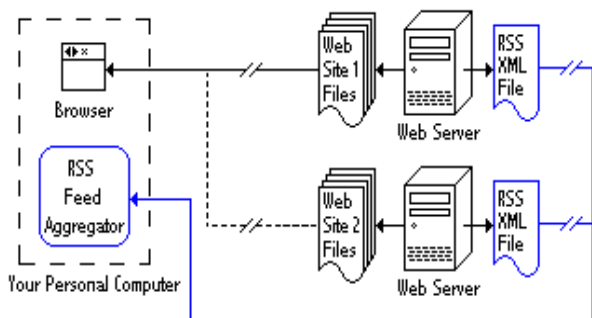


Fig. 3 : RSS aggregator

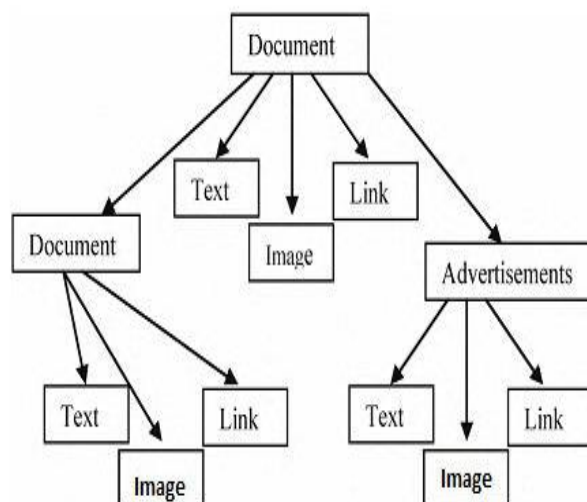


Fig 3: Representation of Web page.

3] Internet surfing:-

User can surf internet through voice commands. There are various types of web pages available on the internet. A web page contains various kinds of contents like advertisements, images, links, animations. These contents may not be useful to visually impaired people. To present these web pages to visually impaired users they should be processed first i.e only useful information should be extracted from web pages and presented to user. In our system, this is performed using HTML parser. Using parser, a syntactic information of a web page is extracted from the html tags. Whole information in the page will be divided into sections. Structure of the web page is obtained by the parser. Web page is re-arranged in a new format. Voice commands are able to reach to new sections that are created by parser. Information about the section from the summary is provided to users. Then as per user's wish he will continue to listen to that section or move to next section. In these sections information which is not useful to user like advertisement, animation are dropped off from structure. Voice commands for entering or skipping links are provided so that the user can navigate through the web pages as per his desire.

4] Document Reader:-

Using this system we can read various documents. Java Swing API set and add speech capability using JSAPI to enable the application to speak JSAPI provide to speech synthesis capabilities. The speech synthesis engine provides different features, such as producing speech output from text, pausing or resuming the speech output, or ending the speech output generation. The speech recognition engine will recognize the commands, will map the command to action and perform the action according to it. Following functions are provided in the system:-

- Start: speak the contents of the text document.
- Pause: pause the playing of the speech output.
- Resume: resume the playing of the speech output from the last pause.
- Stop: stop the speech output.

Conclusion:-

The proposal offers a user friendly interface. This software is applicable for any version of Windows operating system, linux operating system. This software also work on various browsers in the market like IE and its versions, Mozilla firefox, Chrome etc.

Text-to-speech systems are now commonly used by people with dyslexia and other reading difficulties as well as by pre-literate children. The intention is to help the disabled people to

get the benefits of internet technologies and email facilities.

The system which is proposed in this paper allows the physical and visually handicapped person to operate a computer in a more efficient and natural way.

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