Voice-Over Assistant: A Simple Assistant for Visually Impaired People

Nishank Tembhurne[1], Sumedh V. Vaidya[2], Afrin Sheikh[3], Sameer Padole[4], Prof. Shrikant Zade[5]

[1,2,3,4,5]*DEPT. OF COMPUTER SCIENCE AND ENGINEERING, PRIYADARSHINI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NEAR CRPF CAMPUS, HINGNA ROAD, NAGPUR*

---***---

Abstract - *Today many of the people are using emergent technologies in order to ease their work or getting smallest of smallest job done. With these technologies' life is becoming much easier to live but still visually impaired people are the lacking behind in using these technologies. As of today, many people suffer from Visually Impairment, it is also one of the biggest problem mankind has been confronting till date. Earlier Braille kind of paper was used to browse, though still used till date, it is bit by nit getting superannuated and can't perform much functions. Also screen reader is one of the technology useful for them but it has also some limitation which makes tough to use it. The visually-impaired segment of the population, the inability to read, has meaningful negative effect on their personal satisfaction. Today, android based solutions are most emerging due to its accessibility and it uses wide range of technology to provide solutions to perform many tasks. This paper discusses the latter solution. It intends to make an application for outwardly debilitated wherein they can play out all sort of assignments with discourse input or physically input.*

Key Words: Text-to-Speech, Visual Impairment, Android, Voice Command, Navigation

1. INTRODUCTION

The World Health Organization (WHO) estimates that 253 million people live with visual weakness. 217 million of those have moderate to severe vision weakness and 37 million are visually impaired. It has been observed that nearly about 40% of total blind population across the world is present in INDIA. As our society farther expands, there have been many supports for weaker section, disabled One of numerous backings that are dire is the assurance of versatility for visually impaired individuals. Today the majority of our work is finished by cell phone and web is most significant aspect of our lives. With the assistance of web, a large portion of the assignment are finished quick. Yet, not every person has that office to utilize. Many visually impaired are also financially weak and some of them are also illiterate as they cannot read or write. As though they can't peruse or compose it is totally pointless for them what is composed on screen. Most of the application requires much active connection also and without it these apps are null. Even the current technology like TTS screen reader and other also cannot provide full efficiency to the users and provide them with what they want. Even Users with much better smartphones also do not get the type of assistance they need while using these technologies making them frustrating at a point. So as to ease their efforts and to provide them with better interface and results for much of their basic things also, we have come up with application which will help visually impaired people use smartphone like the ways normal people use and ease their efforts on using it making easier for them.

2. LITERATURE SURVEY

Many researchers have contributed in this field. Different kind of current utilized technologies are used. The fusion of several sensors is one of the techniques used for hindrance detection [1], where blend of visual sensors, sonar and inertial assessment unit are used to distinguish the presence of a snag and give sound just as material input to client. Another system was to implement OCR using Raspberry Pi sensor for automatic recognition of the natural messages and by usage of TTS [2]. TapTapSearch, a similar type of application was developed to help blind users to communicate with various things using cloud technology [3]. Read2Me, again a similar type of application was used to focus on reading out text and other books material to blind user [4]. iSee, an application was developed to serve as virtual eye to user enable them to sense of having vision.[5] Android phone-controlled voice gesture and touchscreen operated wheelchair where voice and gesture is recognized through android [8]. Developers also created a universal voice control on android which is used to launch android application via voice commands [13].

3. PROPOSED SYSTEM

The proposed system is to develop a simple android application with better user interface which will serve them as voice assistant. This assistant will do their all kind of task from basic to advance without much internet connection. It will work on any simple smartphone with low interface. The user will have multiple choice of input. They can use speech recognition method or use manual input method. As keeping in mind of privacy of users, manual input method has been added. When user is in public place, they can use manual input method. The system has customized messaging module, call log module, note making feature, Navigation feature, Web Browsing feature. The scope of adding modules is wide.

3.1 MODULES

GUI: Graphical User Interface is used to interact with the users. It describes how the application will look. Since our application is mainly for blind peoples, it does not depend much on appearance but on the working and functionalities. The user will be able listen to the output of what they spoke or touch on screen as input.

Messages: This application has customized messaging feature with inbox, outbox etc. Whenever user receives any message it will have voice alert. When user taps on any particular message it will speak out every single detail to it. Similarly, while sending user can send message by manual method or speech method. In Manual method there is customized keypad which will speak out every single key it presses enabling user to know which they are pressing. By speech method they can use voice input to send messages.

Call Logs: This module helps users to make call to anyone. Also, when receive a call, it will speak out the number or name to user. It has custom dial pad which when keys of it pressed it speaks out that number to user. Also using speech input users can speak contract name or number and make call.

Notes: The users can include, alter, erase or can roll out numerous improvements in their notes utilizing redid keypad. It likewise has exchange decision of voice contribution to it. Utilizing altered client will have the option to realize which key they are squeezing. To peruse past notes, they can tap on that specific note and it will be stood up to the client.

Text-To-Speech: All the activities performed are spoken to clients empowering them to know where they are right now on-screen interface.

Speech-To-Text: Since visually impaired users cannot see, they can simply use their voice as an input. The voice is then processed, synthesized and then converted into normal text for further process.

Voice Recognition: In this process the speech of the user is recorded and analyzed which is then converted into a set of words and then the tasks corresponding to those words are performed. The accuracy of the voice recognition differs in modality of speech, confusability, vocabulary size, language constraints and tasks.

OCR: This module is used to extract texts from images and then speaking out the extracted text to user. This will enable users to read text written in any image. They can also use it to understand text-pictures often used now.

Navigation: This module enable user to give input as place which they want to know about and get result of it in voice form. User can also locate any shop nearby them. This module uses Google Maps API to enable Maps. It additionally shows client their present area.

Web Browsing: This module enables user search anything on internet using customized browser. This browser uses speech recognition method for searching and users get spoken output. It will speak out every detail which user tap on screen interface. They can download images and also do various other tasks with it.
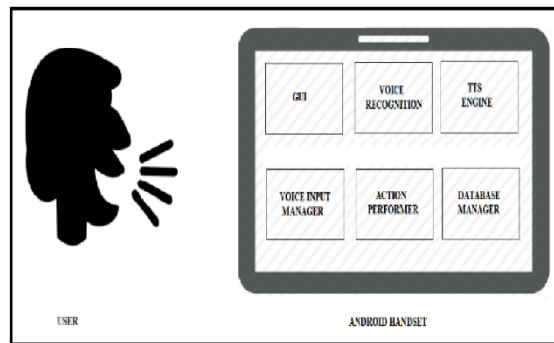
4. SYSTEM DIAGRAM

Fig 1: Proposed System

5. DATA FLOW

A data flow diagram graphical apparatus used to portray and break down development of information through a framework. These are the focal device and the premise from which different parts are created. The change of information from contribution to yield, through prepared, might be portrayed sensibly and freely of physical segments related with the framework. These are known as the sensible information stream charts. A DFD is otherwise called a "bubble Chart" has the reason for explaining framework necessities and distinguishing significant changes that will become programs in framework plan.

Level 0:

Client will enter contribution of their decision. The info is perceived by the application. At that point activity is performed on input given. The information given is check in database. If the relevant data is found to in input it is passed to user as output or feedback.
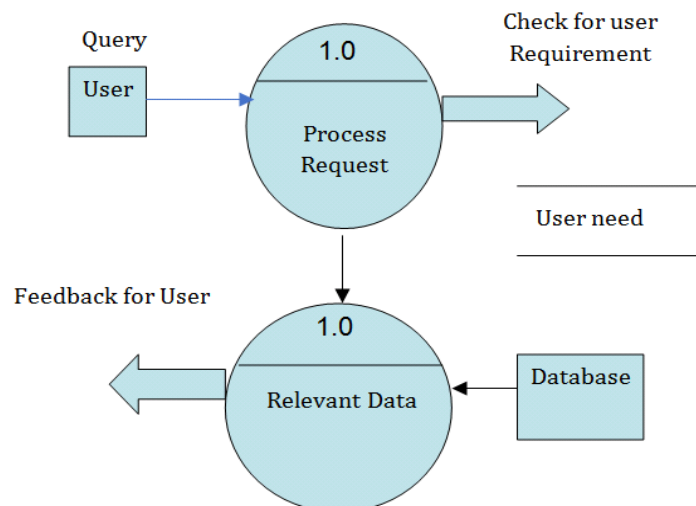

Fig 2: DFD Level 0

6. SEQUENCE DIAGRAM

Sequence diagram helps us to understand the sequence of the system in which activities are performed.

First User enters the input by his choice. The it is processed by the application and it finds the particular data requested by user. If it is present then it acknowledges it and returned as output to user. If not then it returns no value to user.
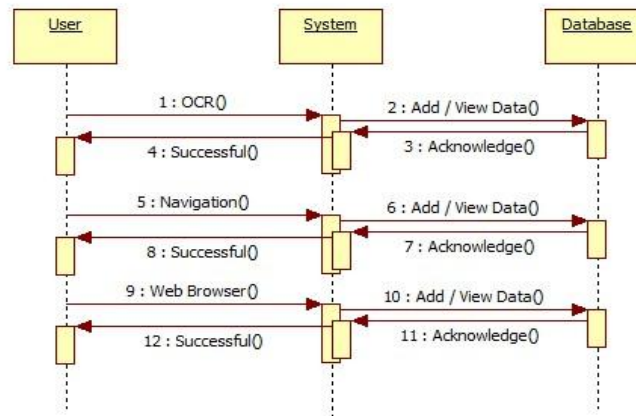
Fig 3: Sequence Diagram

7. CONCLUSION

In this paper, we have successfully proposed a much basic and useful voice assistant for android system for visually impaired users. It will be much helpful and useful for every visually impaired person to use the sophisticated tasks in easy and better way without much confusion. This Voice Over Assistant system is much beneficial to them as they can easily use electronic gadgets with TTS (text-to-speech) system to interact with Mobile phones and Tablets easily.

REFERENCES

[1] M. T. B. R. A. A. K. Y. Kevin Labuan, "A Wearable Portable Electronic Travel Aid for Blind," in International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT), 2016

[2] V. Karthick Raja, A. Kartik, S. Prabhakaran "Voice Assistant for Visually Impaired People" in International Conference on Communication, Computing, and Internet of Things (IC3IoT)

[3] Mrs. Pankar Dipak N., Miss. Pawar Pranjali N., Miss. Avhad Priyanka A. "TapTapSearch: An Intelligent Cloud Based System for Visually Impaired" in International Journal of Engineering Development and Research 2016

[4] Heba Saleous, Anza Shaikh, Ragini Gupta, Assim Sagahyroon, " Read2Me: A Cloud- based Reading Aid for the Visually Impaired ", Aug 2016 IEEE

[5] Maya Rida, Michel Nahas, Milad Ghantous, "iSee: An Android Application for the Assistance of the Visually Impaired", Springer International Publication, 2014

[6] Arun Gopi, Shobhna Devi P, Sajini T, Bhadran V K," Implementation of Malayalam Text to Speech using Conca native based TTS for Android Platform", International Conference on Control Communication and Computing (ICCC), 2013

[7] THOMAS, S. Natural Sounding Text-to-Speech Synthesis based on Syllable like Units, Department of Computer Science and Engineering, Indian Institute of Technology Madras, 2007

[8] Shraddha Uddhav khadilkar, Narendra Wagdarikar, "Android phone-controlled Voice Gesture and Touch screen operated Smart Wheelchair", International Conference on Pervasive Computing (ICPC), 2015

[9] Dongmahn SEO, Suhyun KIM, Gyuwon SONG, Seung-gil, "Speech-to-Text-based Life Log System for Smartphones", IEEE International Conference on Consumer Electronics (ICCE), 2014

[10] GulbaksheeDharmale, Dr. Vilas Thakare, Dr. Dipti D. Patil, "Intelligent Hands-Free Speech based SMS System on Android ", International Conference on Advances in Human Machine Interaction (HMI - 2016), March 03-05, 2016, R. L. Jalappa Institute of Technology, Doddabal- lapur, Bangalore, India

[11] Kuei-Chun Liu and Shau-Yin Tseng, "Voice Helper: A Mobile Assistive System for Visually Impaired Persons", 2015 IEEE International Conference on Computer and Information Technology; Ubiquitous Computing and Communications; Dependable, Autonomic and Secure Computing; Pervasive Intelligence and Computing.

[12] Prof. Rakhi Bharadwaj, Poonam Gupta, Pooja Jadhav, Bhagyashree Kadam, Amruta Kedari," Android based automated Wheel Chair", International Journal of Innovative Research in Computer and Communication Engineering, Vol 4, Issue 3, March 2016

[13] Yu Zhong, T.V. Raman, Casey Burkhardt, FadiBiadsy and Jeffrey P. Bigham, "JustSpeak: Enabling Universal Voice Control on Android"