Android text messaging application for visually impaired people

Siddhesh R.Baravkar
Department of Information Technology,
Sinhgad Academy of Engineering, Pune, India

Mohit R.Borde
Department of Information Technology,
Sinhgad Academy of Engineering, Pune, India

Mahendra K. Nivangune
Assistant Prof. Department of Information Technology,
Sinhgad Academy of Engineering, Pune, India

Abstract— **Texting that is SMS is important function of any Mobile phone and we know that the mobile phone usage in the World is spreading rapidly and has gone through great changes due to new developments and innovations in mobile phone technology.**

This paper is based on creating a messenger for the Differently-Abled set of Humans, who may not be in the position of using mobile phones for messaging or any other kinds of communicating devices, with the required comfort, we called it as application .In other words, messaging can be completely voice based. The proposed Application is a Messaging System, which is Voice enabled. The application listens to your messages and then responds with voice commands by talking. The application converts your text into voice and voice into text. For Android it is Voice- to- Text technology to listen to what you send and gets you connected with people.

Keywords —**Receiver side, Sender side ,Text to voice, visually impaired people ,Voice to text .**

I. INTRODUCTION

Cell phones are very important part of modern life. Many of us need to make a call or send a message at anytime from anywhere. For visually impaired users voice based contact list are provided with many cell phones, they can select contact through voice and make call when required. Also various screen reader software's are available that guide them while using cell phones. But for that they have to remember keys because these software's provide guide for navigation only.

Now let's limit our focus towards short message system, it is text messaging service component of phone, using standardized communications protocols that allow the exchange of short text messages between mobile phone devices. SMS text messaging is the most widely used data application in the world, with 2.4 billion active users, or 74% of all mobile phone subscribers

Speech Recognition and Conversion will be the integral part of the Application. Android actually provides support for those groups which are quite not noticed by many. Coming to differently abled humans they face more troubles than the usual being. It will be always a delight for them to enjoy as normal being with all such factors. The Application is targeted at the **Differently-Abled set of Humans**, who may not be in the position of using mobile phones for messaging or any other kinds of communicating devices, with the required

comfort. Basic operation performed by the application is SMS sending and SMS reading and it is built for these kinds of people.

The application converts your voice message in to text [1][2][3][6]format while sending message and text message into the voice format[7][8] when it receives message, with the required embedded intelligence in the given context. Proposed application is a must carry through for all those who are visually impaired.

II. REASONS FOR ANDROID

Mobile software development has evolved over the time[5]. Android has emerged as a new mobile development platform, building on past successes and avoiding past failures of other platforms. Android was designed to empower the developer to write innovative applications[4]. The platform is open source, with no up-front fees, and developers enjoy many benefits over other competing platforms.
Android is hailed as "the first complete, open, and free mobile platform."

Complete: The designers took a comprehensive approach when they developed the Android platform. They began with a secure operating system and built a robust software framework on top that allows for rich application development opportunities.

Open: The Android platform is provided through open source licensing. Developers have unprecedented access to the handset features when developing applications.

Free: Android applications are free to develop. There are no licensing or royalty fees to develop on the platform. No required membership fees. No required testing fees. No required signing or certification fees. Android applications can be distributed and commercialized in a variety of ways

III. NEED OF APPLICATION

The current software's which are in the market for differently abled people, are generally screen reader software's which force them to use the keys on keyboard. For sending the message they need to type the message manually and remember the keys. This practice makes it very difficult for them to use those softwares.

Now days may smart messengers are available in Android market which are based on voice to text transmission. Sometimes we call it as instance messenger in that, if you

want to send message, speak that message, message will be converted into text and sent as SMS. In many cases these messengers provide option for sending message, not for received messages. These applications can be used by visually impaired people but many a times they find it difficult to interact. To use this they have to remember so many things such as voice commands or keys.

Another important thing in this context is that, these applications are not available in multiple language platforms.

Our project's aim is to help the differently abled people to interact with other's through our application. The visually impaired people, many times find it difficult to interact with other people through current messaging system. The application provides with better user interface and interaction is completely through voice, where the user does not need to use the physical touch or press any key for interaction. As the application is built on top of the SMS layer, so there is no need of installing application at both the ends. Also, the application provides facility to read message in multiple languages.

IV. DESIGN OF APPLICATION

The design modules of application are shown in figure 1. For application, android device provides platform for execution. Each android device has SMS facility which is dealing with SMS related activities such as sending messages, receiving messages, message notification and alert etc. The application is build on top of SMS i.e. when a user installs the application all messaging is done through application. If user wants, user can open messages from inbox, but when message is received, by default message will open in application. This application uses SMS Manager class which is provided by android to handle SMS related activities.
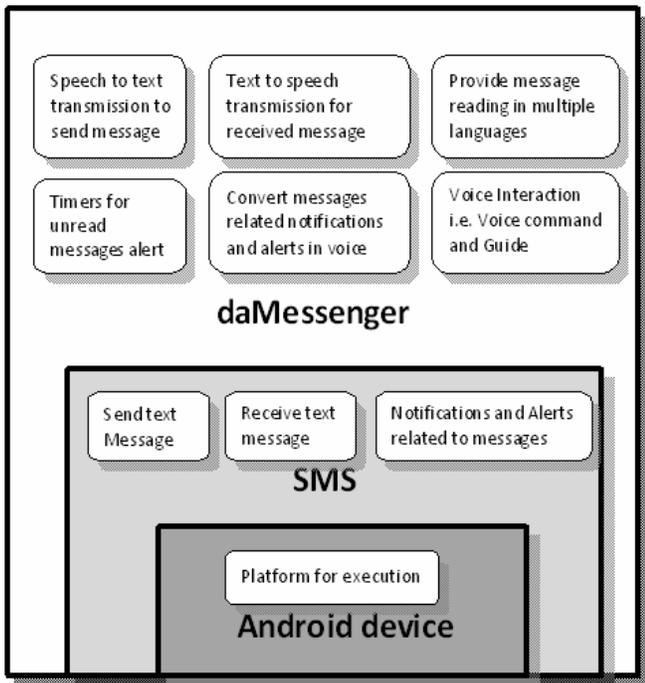

Figure 3. Design of application

As shown in figure, the application is divided in to various modules. The main modules are voice to text and text to voice conversion at sender and receiver side respectively. Also when message is received, application provides option to change language to read message in multiple languages. The application provides total voice interaction i.e. application provides guide that consists of voice based instructions, i.e. in that voice commends are explained to user for performing various operations. User will interact with application completely through voice, so it will provide better user interface and interaction facility. All notifications and alerts received from SMS are processed in voice by the application. In case, if receiver is not present at time when message is received, message received notification will be repeated over a period of time, for that timer is used for notification of unread messages

V. WORKING OF APPLICATION

Application will always be in running state at the background once it is started

The application is built on top of SMS, so that once application is installed on mobile, all SMS related activities are by default performed by application.

With respect to user perspective, application working is divided in two ways – One application is used for sending messages and other when application is used to read received messages.
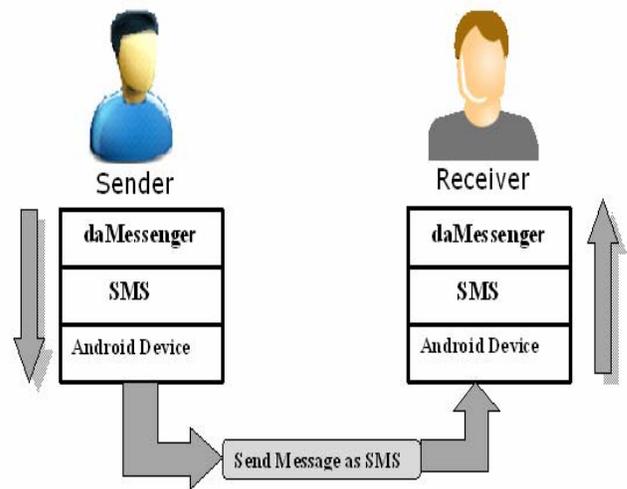

Figure 2. Application at work

For sending message, voice command is provided to open application to send message .Once application is open, it will ask for contact of receiver, then it will ask for the message to be sent, then it will speak that message to check, after conforming the message it will send it to corresponding receiver. Every time the application asks anything, through voice and user also provides response with voice commands that are told by guide.
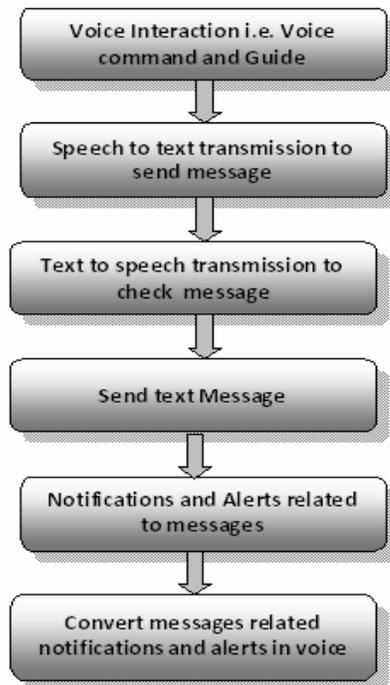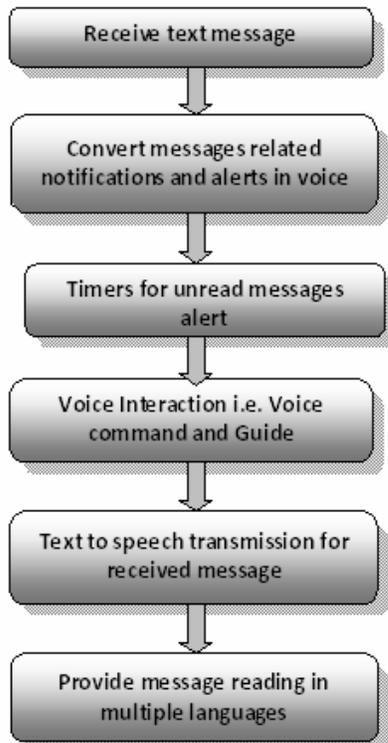
Figure 3. Application at Sender side

At receiver side application provides option to read message in multiple languages. When message is received application gives notification and ask for reading, if user is present then user reads that message. In case if user is not present, application provides notification at regular interval until message is read. For this reason timer is used for unread message notifications. As in sender side, user will interact with application through voice commands and application also provides guide through voice. Because of voice interaction, application provides convenient user interface for visually impaired users

VI. CONCLUSION

This project demonstrates us the idea of messaging system for visually impaired users. Speech synthesis has long been a vital assistive technology tool and its application in this area is significant and widespread. It allows environmental barriers to be removed for people with a wide range of disabilities. In recent years, Text to Speech for disability and handicapped communication aids has become widely deployed in Mass Transit. Text to Speech is also finding new applications outside the disability market. For example, speech synthesis, combined with speech recognition, allows for interaction with mobile devices via natural language processing interfaces.

As part of sending message application is responsible for voice to text transmission to convert message told by user into text, text to voice to check message, and for interaction through voice.

Figure 4. Application at receiver side

REFERENCES

[1] Brandon Ballinger, Cyril Allauzen, Alexander Gruenstein, Johan Schalkwyk, ―On-Demand Language Model Interpolation for Mobile Speech Input ‖, INTERSPEECH 2010, 26-30 September 2010, Makuhari, Chiba, Japan, pp 1812-1815

[2] Ryuichi Nisimura, Jumpei Miyake, Hideki Kawahara and Toshio Irino, ―Speech-To-Text Input Method For Web System Using JavaScript ‖, IEEE SLT 2008 pp 209-212

[3] M. Tomalin, F. Diehl, M.J.F. Gales, J. Park & P.C. Woodland , ―Recent Improvements To The Cambridge Arabic Speech-To-Text Systems ‖, ICASSP 2010 pp 4382-4385

[4] Janet See, Umi Kalsom Yusof, Amin Kianpisheh, ―User Acceptance towards a Personalized Hands free Messaging Application (iSay-SMS) , CSSR 2010 Initial Submission December 5-7, 2010 pp 1165-1170

[5] Panikos Heracleous, Hiroshi Ishiguro and Norihiro Hagita, ―Visual-speech to text conversion applicable to telephone communication for deaf individuals 18th International Conference on Telecommunication 2011. pp 130-133

[6]G. Potamianos, C. Neti, G. Gravier, A. Garg, and A.W. Senior, ―Recent advances in the automatic recognition of audiovisual speech, in Proceedings of the IEEE, vol. 91, Issue 9, pp. 1306–1326, 2003

[7]Santos, J. ,Ciudad Universitaria, Madrid, Spain ,Nombela, J. –"Text-to-speech conversion in Spanish a complete rule-based synthesis system"‖Acoustics, Speech, and Signal Processing, IEEE International Conference on ICASSP '82.

[8] Kain, A. ,CSLU, Oregon Graduate Inst. of Sci. & Technol., Beaverton, OR Macon, M.W. –"Spectral voice conversion for text-to-speech synthesis" ‖ Acoustics, Speech and Signal Processing, 1998. Proceedings of the 1998 IEEE International Conference