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Ubicomp Application for Blind using Android

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Abstract :- Interaction between normal people with blind person is very difficult because of communication problems. There are many applications available in the market to help the blind people to interact with the world. Voice-based email and chatting systems are available to communicate with each other by blinds. In this paper, a new mobile application is developed called Ubicomp App. This helps to interact with persons by blind people. This application includes a voice based and text based interaction approach.

Keywords: - Android application, Ubicomp, GUI design, Blind application.

I. INTRODUCTION

From the very beginning of human history peoples are suffering from many disabilities. Among those blindness is very common and unendurable. Science and technology always try to make the human life easier [1]. Each blind individual faces different challenges based on their specific level of vision. With the rise of various support-based organizations, more visually impaired people have been given the opportunity to education and many other means. But still the issue of operating the mobile phones for the blind is very difficult issue. Blind people require built-in accessibility functionalities to help them to use mobile phones.

Accompanied by the rapid growth of information technology engineering, android mobiles are now used widely in a variety of fields. Applications of mobiles and various software in training, teaching, learning and computer assisted instruction are a major future trend [2]. However, most applications are designed for normal person, and are in accessible to people living with disabilities, unless extra adapting tools and interfaces were designed for them. Cell-phones are very important part of modern life. Many of the blind people need to make a call, message or needs to use some apps in the mobile phones at anytime, anywhere [3, 4].

This paper is to help differently abled people to interact with others through our application. The blind people, many times find it difficult to interact with other people though current mobile application system. The application provides with better user interface and interaction is completely through voice. Speech reorganization and conversion will be the integral part of the application. Android activity provides support for those groups which are quite not noticed by many.

The rest of the paper is organized as follows. In section 2, describes related research works. In section 3, methodology used to develop an application is explained. GUI design is discussed in detail in section 4. Finally a brief conclusion is given.

II. RELATED WORK

In [5] A Ganz et. al. proposed PERCEPT Indoor Navigation system. By using PERCEPT, blind users will have independent access to public health facilities such as clinics, hospitals, and wellness centers. It will improve the quality of life and health of the blind and visually impaired community by enabling independent living.

Mohammad Hazzaz Mahmud et. al. invented a Smart Walking Stick for the blind peoples suffering from many disabilities [6]. This device based on automated hardware that can corroborate a blind to detect obstacles in front of him/her.

Ramiro Velazquez and Mexio built a Wearable Assistive Device for Blind [7]. This system facilitates the user's ability to perform normal daily task without feeling encumbered by burdensome devices. To illustrate work done I this area devices worn on the fingers, hands, wrist, forearms, tongue, head ,chest abdomen and feet have been proposed over the last decades to provide variable solutions to the problems of reading and mobility.

In [8] G. Lavanya M E et. al. projected Passenger Bus Alert System for Easy Navigation. In this project they proposed a bus system using wireless sensor networks. The blind people in the bus station are provided

with the ZIGBEE unit which is recognized by the ZIGBEE in the bus and indication is made in the bus that the blind is present in the station so that bus stops at particular station.

Vikrant A Agaskar et. al. in [9] designed a Voice Based PC Control for Blinds. Development of graphical interfaces and visual programming concepts has created serious problems for the blinds regarding usage of computer and visualization. Through this paper they would like to empower the blind people by providing them a tool to perform the basic task on their computer. The main aim behind this paper is to create voice enabled PC control software that will help them to use their voice.

III. METHEDOLOGY

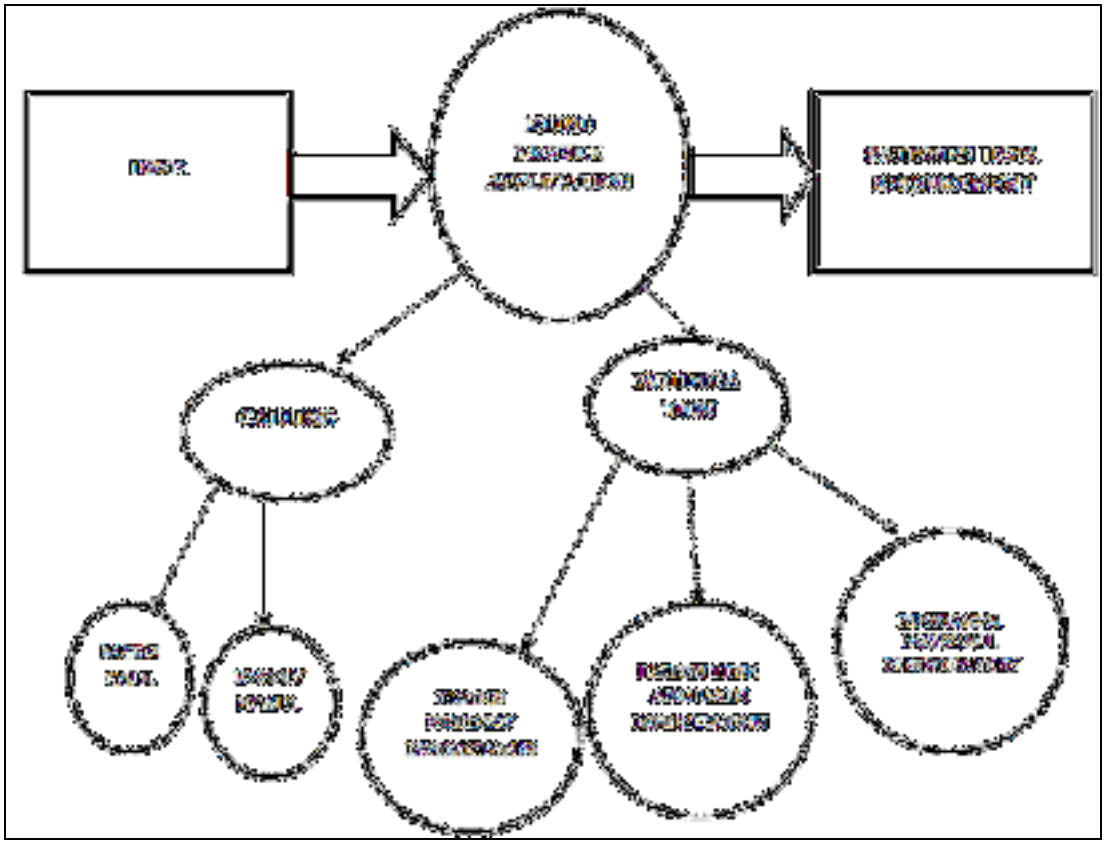

Fig. 1 Architecture of the Proposed System

This system is developed to help for blind people to use the touch screen android based phones. Speech synthesis has long been a vital assistive technology tool and its application in this area is significant and wide spread. For example, speech synthesis combined with speech recognition, allows for interaction with mobile devices via natural language processing interface. Using this system they communicate like a sighted person it allows blind and visually impaired individual to receive and dial calls, adding contacts, notification about date and time, battery statues, message and miscall statues etc from their phones.

Fig. 1 demonstrates architecture of proposed system with calling and notification options. The calling potion of the system having make call and receive call options. Notification menu have battery statues, date and time notification. This also includes the message and miscalls alerts.

The flow chart about the proposed system is shown in Fig. 2. The Calling option will help the blind person to make call and receive call by voice based only. The notification section will help him/her to understand the battery life time. This field also help to set listen the current date and time. The miscall statues and new message notification also available in this option.

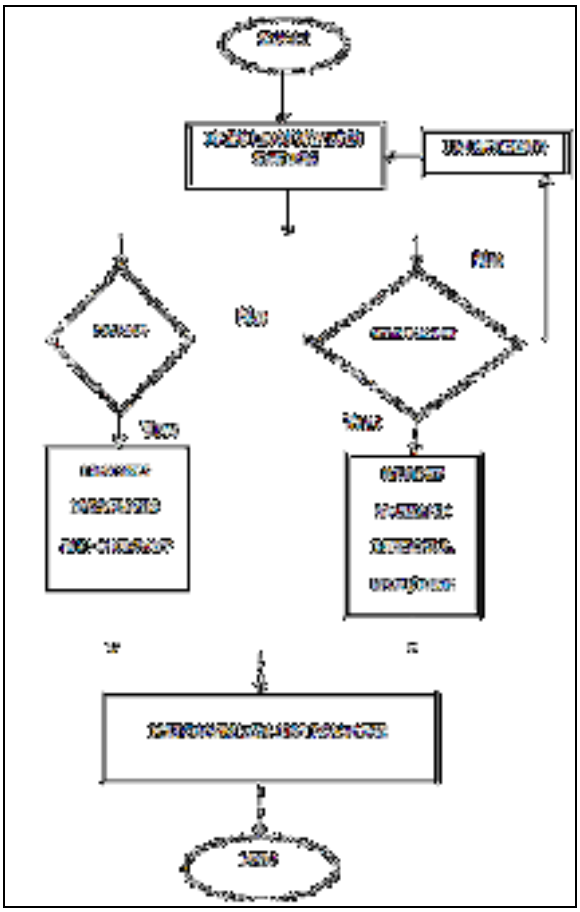

Fig. 2 Flow chart of the proposed system

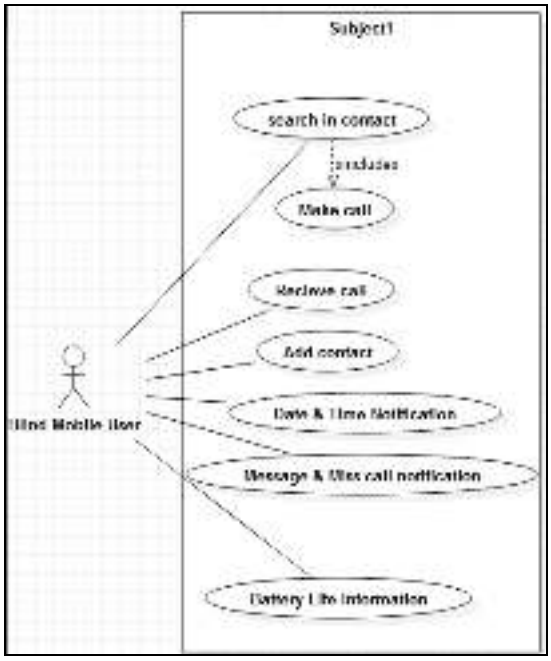

Fig. 3 Use case diagram for blind navigation system

The first phase of designing any system is requirement gathering, so the information related to this application is collected by different end users by meeting and doing interviews. Then use case diagram is designed according to the requirements gathered by the end users. This use case diagram describes in detail the system boundary, actors and use cases. Fig. 3 shows the relationship between use cases using StarUML 5.0 [10].

IV. GUI DESINGN FOR MOBILE APPLICATION

The proposed system is developed by using Android OS. This system is totally voice oriented, so the blind can add the contacts by voice. First client should select the blind mode of operation. Then he has to tell about the locality of the contact person (inner state, interstate or out of county), according to that information digits should be entered. That is for inner state 10 digits, for interstate 11 digits and for out of country 12 digits. Then next option is to store the contact persons first name and last name. After conformation of all the information given by the user, the details are stored in the mobile pone's contact area. Blind can call the person by telling the words "To be Call", then the phone book will open and application will ask the person "to whom he want to call?" Just telling his name the application will call that person.

The notification section of the application mainly performs three operations, like battery statues information. This notification just informs the user, if battery level is less than 25%. The date and time notification section will inform the current date and time to the user, whenever he needs that information. The miss call and message notification is just like normal phones, it will gives a beep sound whenever message arrives. The GUI of the proposed application is shown in Fig. 4.

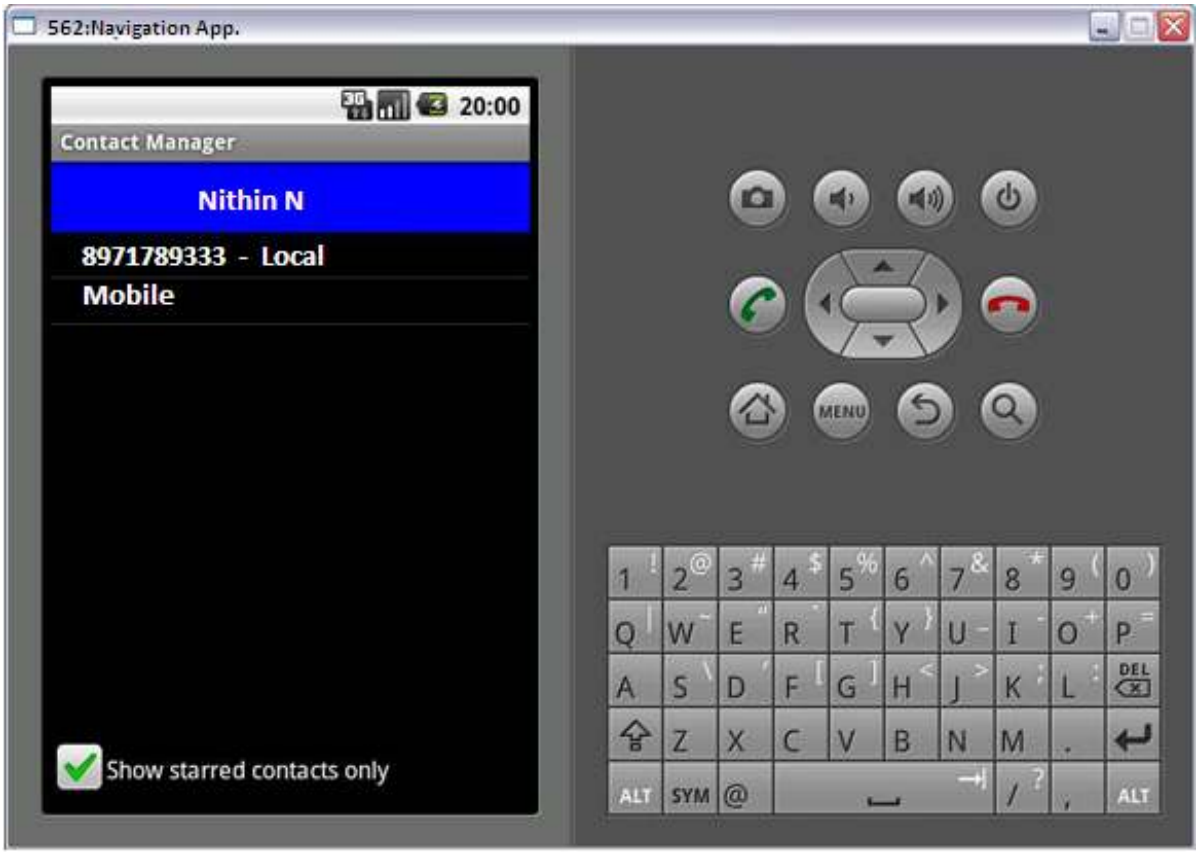

Fig. 4 GUI design for the Blind users for storing the contacts

V. CONCLUSION

The developed system is totally voice based application. It will make mobile usage easy for the blind person. Using this application blind can make a call to any persons and also able to store the contact details of the people. This application will help him by giving notification about the battery life, date and time. Blind can notify the miss call details and message arrival by using beep sounds. This application can also improve by giving varies facilities that can help the blind users.

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