Unmute: an Android app for Deaf and Hard Hearing Students

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Abstract— Hearing deficit individuals face challenges that cannot be avoided but they can overcome it with the powerful tool of education. It is a tool that is undeterred to the barriers of communication and thus it promises them a normal life of equality and independence. This paper is an attempt to propose the android application with modules for students, volunteers and donors catering to various aspects of learning to become a one stop solution for the hearing impaired. The underlined features of the application are text-to-speech conversion, a pool of tests with detailed progress report for students were the study resources are monitored by volunteer module. Additionally donation module records donors donating phones, books and money.

Keyword— Android application, text-to-speech, Progress report

I. INTRODUCTION

A reliable source of communication medium for individuals with hearing loss or complete deafness is sign language or an oral interpreter. However not everyone has the means or the capability to possess these resources. Thus when it comes to education these users face tremendous problems. With them as our prospective users our application aims at providing a platform based on android with various modules that will help reduce the complexity of learning. Student management system, Volunteer management system and Donation are the modules that will incorporate various sub modules developed mainly using Android studio and JavaScript.

The student module has the distinctive feature of text-to-speech conversion. Completely deaf or hard hearing users can communicate to other individuals by inputting their text message which is converted to audio. This simple feature saves the effort to invest in an oral interpretor or learning of sign language. Students using this application will be largely benefited by giving tests. It has customized tests in Maths, English and logic. One user per test is the user to test ratio. Users have access to in depth study materials in form of videos and PDFs uploaded by the volunteers. In addition to this users have educational games to broaden their logical skills. Apart from educational progress hearing impaired users who are prospective job seekers can acquire them via the classified section in the job module of the application. The resources and skill training for these jobs will be monitored by volunteers who can upload the essentials keeping the requirement of the hiring company in view.

The volunteer module works along with student module. The study material required for giving the tests are uploaded by the volunteer. The volunteer are also required to go to the Centre where they teach students using this application. So, only when the volunteers reach the desired location can they logon to the app and this message of login activity is immediately sent to the administrator so that they can monitor volunteer movement. Volunteers also get the progress report of the tests given by the students. This progress report is unique for each individual student and thus providing volunteer with the academic record of the student. Another distinctive feature of the application is a attendance record of all the students are generated. Admin shall be provided with the access to the entire system, the admin shall be able to register new students and grant them access to all the uploaded educational material.

The application comprises of a module for external users. Wherein by downloading the application they can donate money, books and used android mobile phones. With an operating version of 4.0 ice cream sandwich which is compatible for running the application.

II. LITERATURE SURVEY

A. Sign Mobiles: An Android App for Specially Able People *[1]*

In this paper, three techniques are implemented to advocate use of sign language on an android based platform.

B. Comprehensive Regarding Hearing Impairment using Smart Android Phone *[2]*

In this paper, the use of spectrogram and spectrum analyzer are included in an android based system to provide a learning tool to the user.

C. Android based aid for the deaf *[3]*

In this paper, speech-to-text conversion is implemented with additional home security feature included to assist the deaf with a security towards home invasion.

III. SYSTEM DESIGN

The Figure 1 shows the block diagram of the application consisting of three major modules, called Student, Volunteer and Donor. The student management system consists of sub-modules: Learning, Test module, Job opportunities and progress analysis. The volunteer consists of another four sub-modules: Location reporting, study material, student performance and attendance. The final donor module consists of donation which can be in terms of money, phones and study material or books.

A. Student Management System:

  a. Learning: Once the user is registered students will be able to login and can directly access the study material uploaded by the volunteers.
  b. Tests: Based on the topics such as math's, english and logic that the students have learned, regular tests shall be conducted and their performance can be monitored.
  c. Jobs: Volunteers will post job openings for the hearing impaired students that the potential job seekers can access using the application.
  d. Text-to-speech: This is an essential feature through which deaf users can communicate with normal people.
  e. Games: Educational games are key to active learning, which comprises of learning and logic based games.
  f. Progress: The analysis of tests given by users are recorded, which can accessed by volunteers as well as students.

B. Volunteer Management System:

a. Sharing Documents: Volunteers will be able to upload study materials in terms of video lectures, pdf, etc. to a common server via which it shall be made available to students and other volunteers.

b. Student attendance: A volunteer logs into the system and thus can they mark the attendance of students which will be recorded for reference purpose.

c. Student Performance: The volunteers teaching students shall be able to monitor the performance of the students on the basis of the tests given by the users.
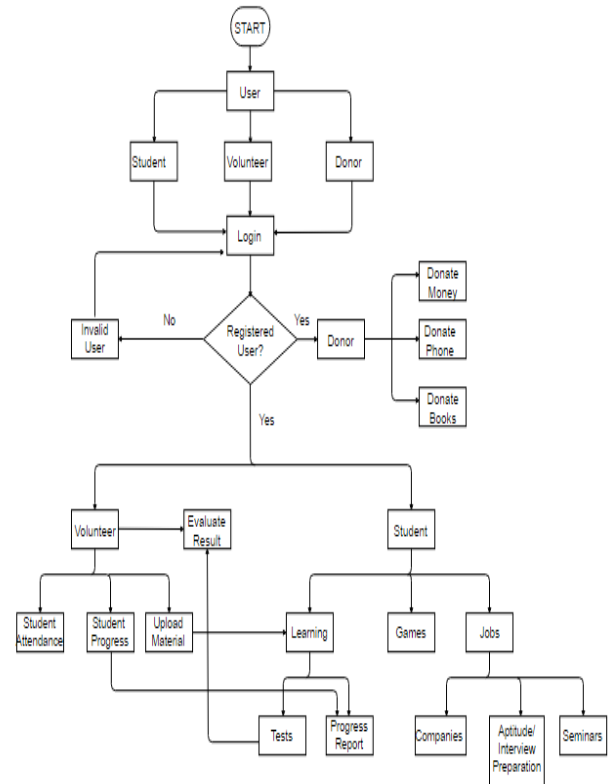

Figure 1: Block diagram illustrating sequence of actions.

C. Donor:

  a. Money: Donors wishing to donate money to the organization can do so by accessing the application and choosing the donate money option by filling one time registration forms.
  b. Phones: Old mobile phones or any other electronic items can do so by choosing the donate phones option with minimum OS requirement of 4.0.
  c. Books: Donors can donate books by accessing the application and filling the form to donate books via the donate option.

IV. HARDWARE AND SOFTWARE SYSTEM DESIGN

The requirements for this system are broadly categorized as hardware requirement and software requirement.

A. Android Phone

The essential requirement is an android smartphone with an Operating System of 4.0 and above.

B. Android Studio

Android studio is the software requirement for the application. Each project in Android Studio contains one or more modules with source code files and resource files. Types of modules include: Android app module, Library module and Google app engine module.
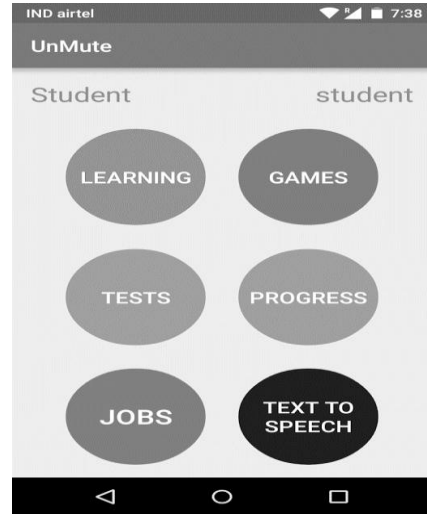
V. RESULTS AND DISCUSSION

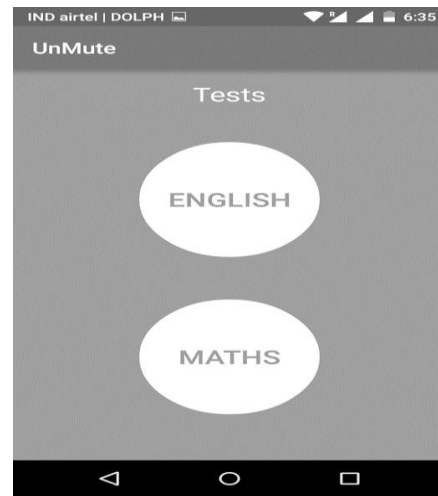We have developed the Android application, provided below are the screenshots.
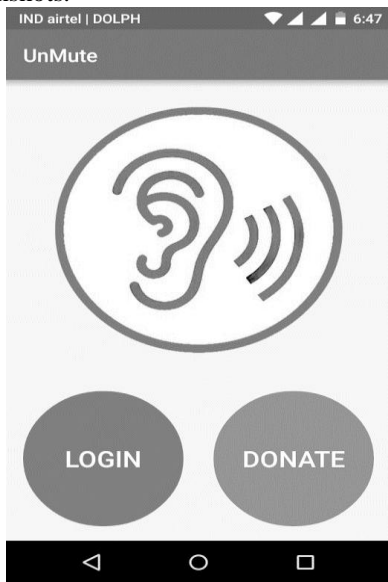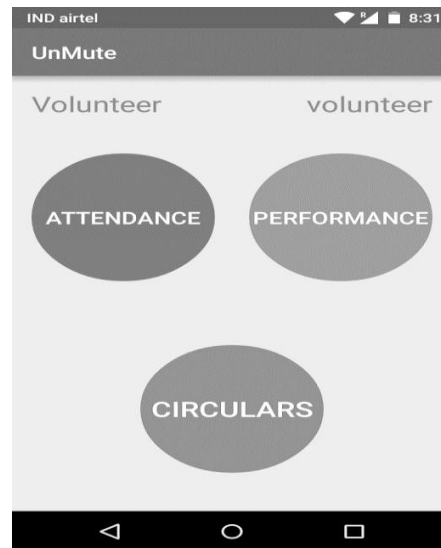
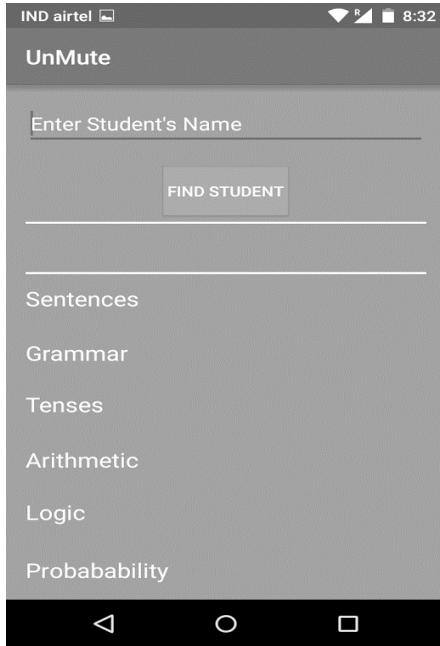Main screen
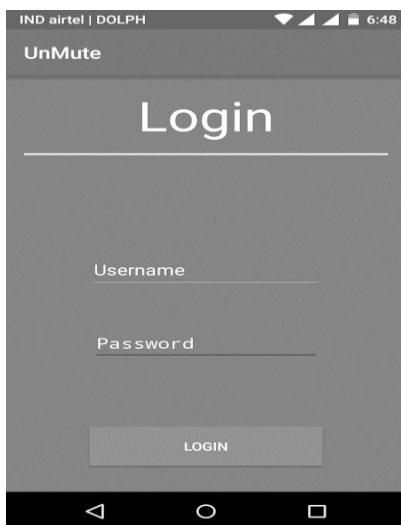
Login for students and volunteer

Facilities for students

Test

Facilities for volunteer

290

Students' progress

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VI. REFERENCES

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