PROJECT REPORT

ON

"ANDROID APPLICATION ON EDUCATION SYSTEM FOR VISUALLY IMPAIRED"

SUBMITTED BY

SAKSHEE SHRIRANG MANKAME

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UNDER THE GUIDANCE OF

PROF. DEEPALI KADAM

DEPARTMENT OF INFORMATION TECHNOLOGY

DATTA MEGHE COLLEGE OF ENGINEERING

SECTOR -3, AIROLI, NAVI MUMBAI- 400 708, (M.S.), INDIA

2018-2019

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ON

ANDROID APPLICATION ON EDUCATION SYSTEM FOR VISUALLY IMPAIRED

SUBMITTED TO THE

UNIVERSITY OF MUMBAI, MUMBAI

Proposed to be submitted in the partial fulfillment of requirement for the

Degree of Bachelor of Engineering in Information Technology

Submitted by

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2017-2018

DECLARATION BY THE CANDIDATE

We wish to declare that the work embodied in this project report entitled "**ANDROID APPLICATION ON EDUCATION SYSTEM FOR VISUALLY IMPAIRED**" forms our own contribution to the project work carried out under the guidance of **Ms. Deepali Kadam** Assistant Professor , Department Of Information Technology, Datta Meghe College Of Engineering, Airoli, Navi Mumbai, affiliated to University Of Mumbai.

This work is carried out, written, compiled and submitted by us for the award of degree of Bachelor of Engineering in Information Technology at the University of Mumbai. This work has not been submitted for any other degree of this University or any other University.

Mumbai _____

Date: Signature of candidate

Datta Meghe College of Engineering

(AICTE & Govt. of Maharashtra Recognized, Affiliated to University of Mumbai)

Department of Information Technology

C E R T I F I C A T E

Date:

This is to certify that, the project work embodied in this report entitled, "Android Application on Education system for visually impaired" submitted by Sakshee Mankame, Gauri Jadhav, Shweta Bhalerao and Padmini Sapre for the award of **Bachelor of Engineering (B.E.)** degree in the subject of **Information Technology**, is a work carried out by them under my guidance and supervision within the institute. The work described in this project report is carried out by the concerned student/s and has not been submitted for the award of any other degree of the University of Mumbai.

Further, it is certify that the student/s was regular during the academic year and has worked under the guidance of concerned faculty until the submission of this project work at the Datta Meghe College of Engineering.

Signature of the Guide **Signature of Head of Department** **Signature of Principal**

College seal

DATTA MEGHE COLLEGE OF ENGINEERING

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CERTIFICATE OF APPROVAL

Project Entitled: "Android Application on Education System for Visually Impaired"

SUBMITTED BY

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SAKSHEE SHRIRANG MANKAME

SHWETA VINAYAK BHALERAO

In the partial fulfillment of the degree of B.E in "INFORMATION TECHNOLOGY" is approved.

Guide(s):

1. Internal:

Examiner(s):

1. Internal:

2. External:

Principal

HOD

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ABSTRACT

With the outburst of smart-phones today, the market is exploding with various mobile applications. These smart phones help the people by providing easy access to information and providing many basic functionalities to them .The sighted people can use such smart phones easily but due to the inability to read information on the screens, blind people face tremendous difficulties in using the smart phones.

Despite growing awareness of the accessibility issues for blind people, designers still face challenges when creating accessible interfaces. One major stumbling block is a lack of understanding about how they actually use touch screens. Many studies have been conducted to compare how blind people and sighted people use touch screen gestures. In this project we propose “Education System for Visually Impaired Students” a mobile application for visually impaired students to help them in academic area.

Moreover, we present a text-to-speech interface to ease the usage of smart phones for the blind user.

Keywords

- Education System
- Blind Students
- Android Education apps
- Visually impaired.

1. INTRODUCTION

1.1 PROJECT TITLE

ANDROID APPLICATION ON EDUCATION SYSTEM FOR VISUALLY IMPAIRED

1.2 OVERVIEW

Mobile phones have become an inevitable part of our daily lives. It is difficult to think of a day without having our mobile phone by our side. The evolution of mobile phones is witnessed by all of us, touch screens being the latest amongst all of them. While touch screens were once rare, touch screen-based interfaces are now present across a wide range of everyday technologies, including mobile devices, personal computers etc. As touch screens have become mainstream, it is crucial that touch screen-based interfaces be usable by people with all abilities, including blind and visually impaired people. Until recently, most touch screens provided few or no accessibility features, leaving them largely unusable by blind people. Unlike fully sighted people, blind people do not have any means to educate themselves other than using the Braille scripting language. Hence, Interaction via mobile devices is a challenge for blind users, who often encounter severe accessibility and usability problems.

The purpose of this research project is to create an application that would enable the visually challenged to use some basic features of mobile phones for education purpose thus making their life a bit simpler. The research is devoted to find an algorithm which would require less time for pattern recognition and that would be efficient. The initial settings require a person with normal vision to configure the application after which the visually challenged user has to just make a predefined command or keyword on the Smart Phone to use all the features.

1.3 BACKGROUND

Despite growing awareness of the accessibility issues for blind people, designers still face challenges when creating accessible interfaces. One major stumbling block is a lack of understanding about how they actually use touch screens. Many studies have been conducted to compare how blind people and sighted people use touch screen gestures. In this project we propose “Education System for Visually Impaired Students” a mobile application for visually impaired students to help them in academic area.

The main issues are due to the lack of hardware keys, making it difficult to quickly reach an area or activate functions, and to interact via touch screen. A touch screen has no specific reference points detectable by feel ,so a blind user cannot easily understand exactly where (s)he is positioned on the interface nor readily find a specific item/function. In this project we, therefore, investigate enriching the user interfaces of touch screen mobile devices to facilitate blind users' orientation called “Education System for Visually Impaired Students”, an Android Smart Phone application for the visually challenged. Through this application education is made possible without the need to see the phone. Accessible touch screens still present challenges to both users and designers. Users must be able to learn new touch screen applications quickly and effectively, while designers must be able to implement accessible touch screen interaction techniques for a diverse range of devices and applications. Because most user interface designers are sighted, they may have a limited understanding of how blind people experience technology. We therefore argue that accessible touch screen interfaces can be improved substantially if designers can better understand how blind people actually use touch screens

The reason for using Android operating system based mobile phones is that Android is an upcoming open source technology. This project would hopefully contribute something to the society and help make the lives of millions of visually challenged people easier. This Application will provide the users with 24*7 availability of the courses and tests for analyzing themselves. This application will also reduce the tedious work of using Braille scripting language and make the touch screen mobile phones friendlier for visually impaired users.

1.4 PROBLEM STATEMENT

The emergence of touch-based mobile devices brought fresh and exciting possibilities. These came at the cost of a considerable number of novel challenges. They are particularly apparent with the blind population, as these devices lack tactile cues and are extremely visually demanding. Existing solutions resort to assistive screen reading software to compensate the lack of sight, still not all the information reaches the blind user. Good spatial ability is still required to have notion of the device and its interface, as well as the need to memorize buttons‟ position on screen. These abilities, as many other individual attributes as age, age of blindness onset or tactile sensibility are often forgotten, as the blind population is presented with the same methods ignoring capabilities and needs.

There is a growing awareness among parents, teachers, blind youth, and the adult blind community that the education which blind children are receiving is failing them. They are not receiving a quality education which can prepare them to compete in the demanding high tech economy and society of the 21st Century. They are not learning to use and trust the alternative techniques which blind persons must have if they are to be successful. They are not developing the positive attitudes toward their blindness which are so essential to them if they are to become mature, responsible, productive adults

1.5 OBJECTIVE AND PURPOSE

In our project, an Android Smart Phone application for the visually challenged is proposed. Through this application the visually challenged user can always be connected with the world around. Through this application the student or user can revise his/her lessons sitting at home and not going through the tedious job of using Braille. The user can simply give tests, solve exercises verbally simply by giving commands. The purpose of this research project is to create an application that would enable the visually challenged to use some basic features of mobile phones for education purpose thus making their life a bit simpler. The research is devoted to find an algorithm which would require less time for pattern recognition and that would be efficient.

The application will include features such as-

1. Audio clips of chapter from a particular course.
2. Taking MCQ tests.
3. Solving quiz.

The initial settings require a person with normal vision to configure the application after which the visually challenged user has to just make a predefined command or keyword on the Smart Phone to use all the features stated above.

1.6 PERIOD OF THE PROJECT

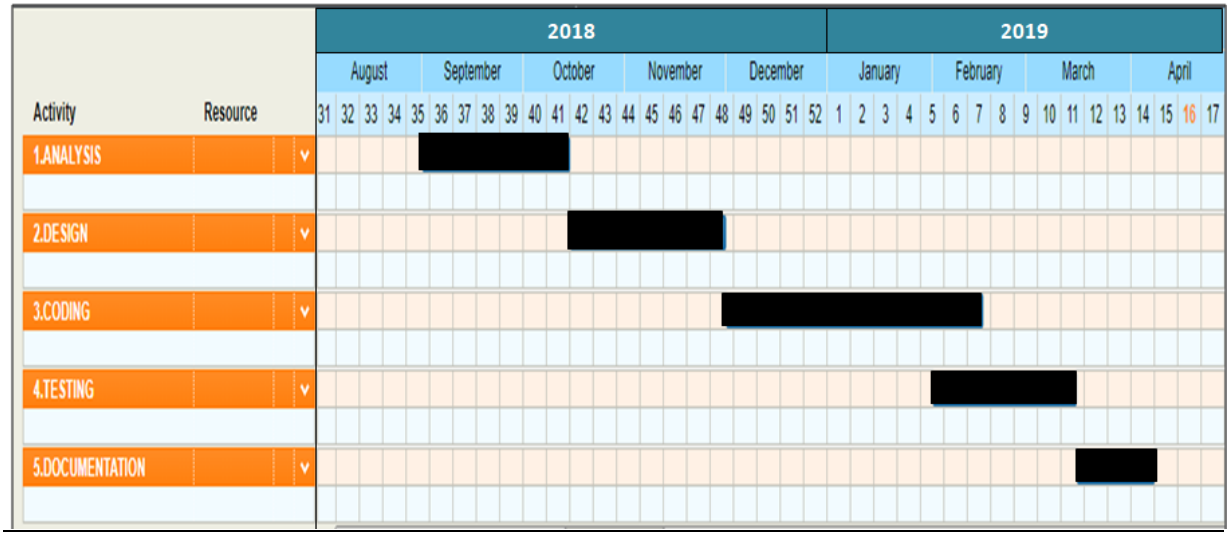


Fig 1

1.7 SCOPE OF THE PROJECT

To develop an Education System that will aid Visually Impaired Students in their academics.

- This Application will store the syllabus of certain subjects as suggested by students.
- The System will be updated as and when required.
- This Mobile Application will also store reminders for assignment, notes and other educational details.

1.8 PROJECT SPECIFICATIONS

SOFTWARE SPECIFICATIONS:

- Android Studio 2.3.3 IDE
- Figma (Designing Software)

HARDWARE SPECIFICATIONS:

- Microsoft® Windows® 7/8/10 (32- or 64-bit)
- 3 GB RAM minimum, 8 GB RAM recommended; plus 1 GB for the Android
- Emulator.
- 2 GB of available disk space minimum,
- 4 GB Recommended (500 MB for IDE + 1.5 GB for Android SDK and
- emulator system image)
- 1280 x 800 minimum screen resolution
- Android-based devices with a minimum of 1GB RAM and supporting v2.2.3 or
- above.
- Data connection-enabled Android device.

1.9 PROPOSED SYSTEM AND DESIGN

1.9.1 System Architecture:

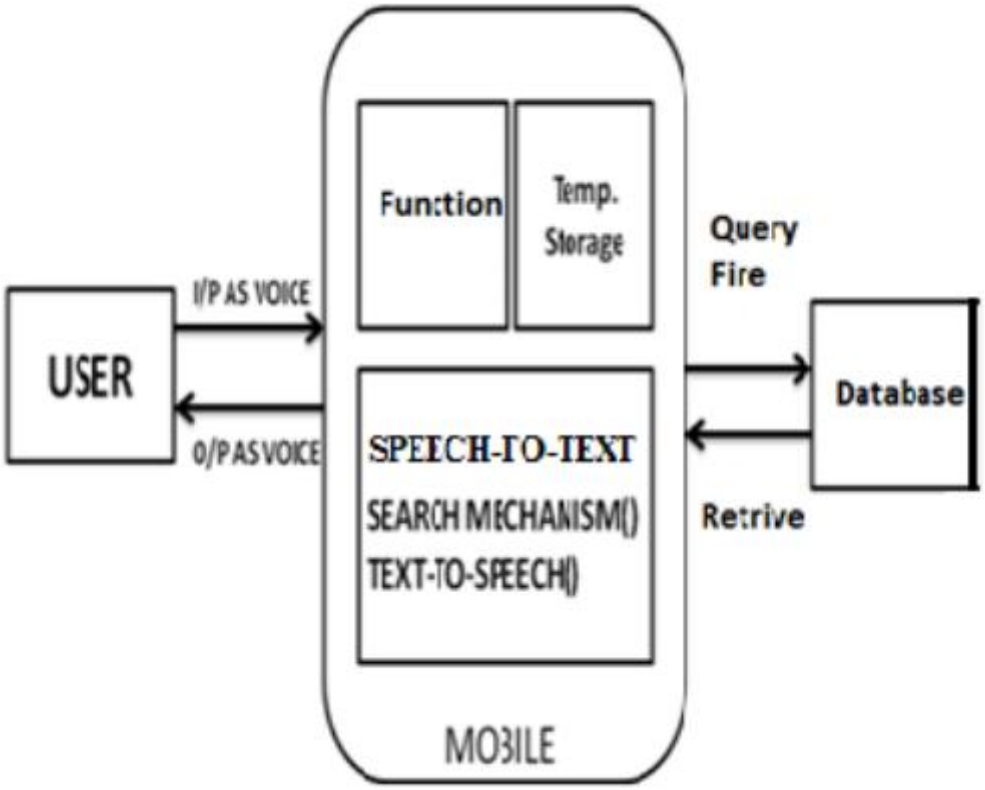
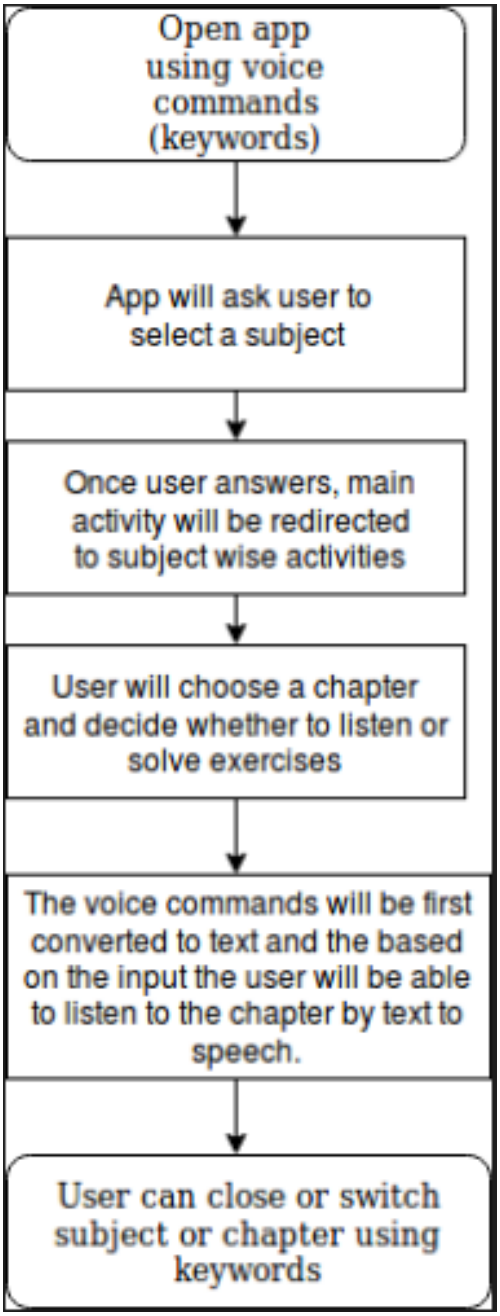


Fig 5.1.1

The Application will be completely based on voice interaction between the system and the user. The user will give the application the command to open (Just like "Ok Google"). Once the Application is opened, the courses will be read out to user and the system will wait for the user's next command. Once the user gives the next command to open a particular course or give an oral test or solve exercises, the system will revert back with required data from the database. . The initial settings require a person with normal vision to configure the application after which the visually challenged user has to just make a predefined command or keyword on the Smart Phone to use all the features.

1.9.2. Project Flow Chart



2. LITERATURE REVIEW

In this paper, our android application aims at helping visually challenged people who want to use the android based smart phones.

The selection of Android as the Indonesian dictionary base for the visually impaired on the Android platforms is provided platform open for developers to create applications.

In addition to Android also features Talk Back and speech to text that was created specifically for the visually impaired. The feature works as an Android screen reader so that the blind people can enjoy the screen display with sound output.

NAME	YEAR	METHOD	FEATURES
AWAAZ: A Bridge between Android Phones and the Visually Impaired	2017	Text to speech	Voice commands
A study of android Smartphone applications by VI students.	2016	Google Talkback, text to speech engine, voice aloud reader	Android Talkback facility
KABITUNA	2006	Talkback facility	Voice commands and text to speech

Table 1

3. METHODOLOGY

The components used in this project can't be specific, since this project is a prototype for all computers. As such, certain prerequisites are as follows:

3.1 TOOLS AND TECHNOLOGIES

JAVA DEVELOPMENT KIT (JDK)

The Java Development Kit (JDK) is a software development environment used for developing Java applications and applets.

ANDROID SDK TOOL (API LEVEL :21/ VERSION 4.0)

SDK is required in order to create standalone applications for windows based system. API LEVEL 21 is used because of its higher compatibility factor.

ANDROID EMULATOR (AVD)

An Android emulator is an **Android Virtual Device (AVD)** that represents a specific Android device. You can use an Android emulator as a target platform to run and test your Android applications on your PC.

ANDROID TALK-BACK FACILITY

Talk-Back: To interact with your device using touch and spoken feedback, you can turn on the Talk-Back screen reader. Talk-Back describes your actions and tells you about alerts and notifications.

Voice Access: Voice Access lets you control your device with spoken commands. Use your voice to open apps, navigate and edit text hands-free

3.2 SEQUENCE DIAGRAM

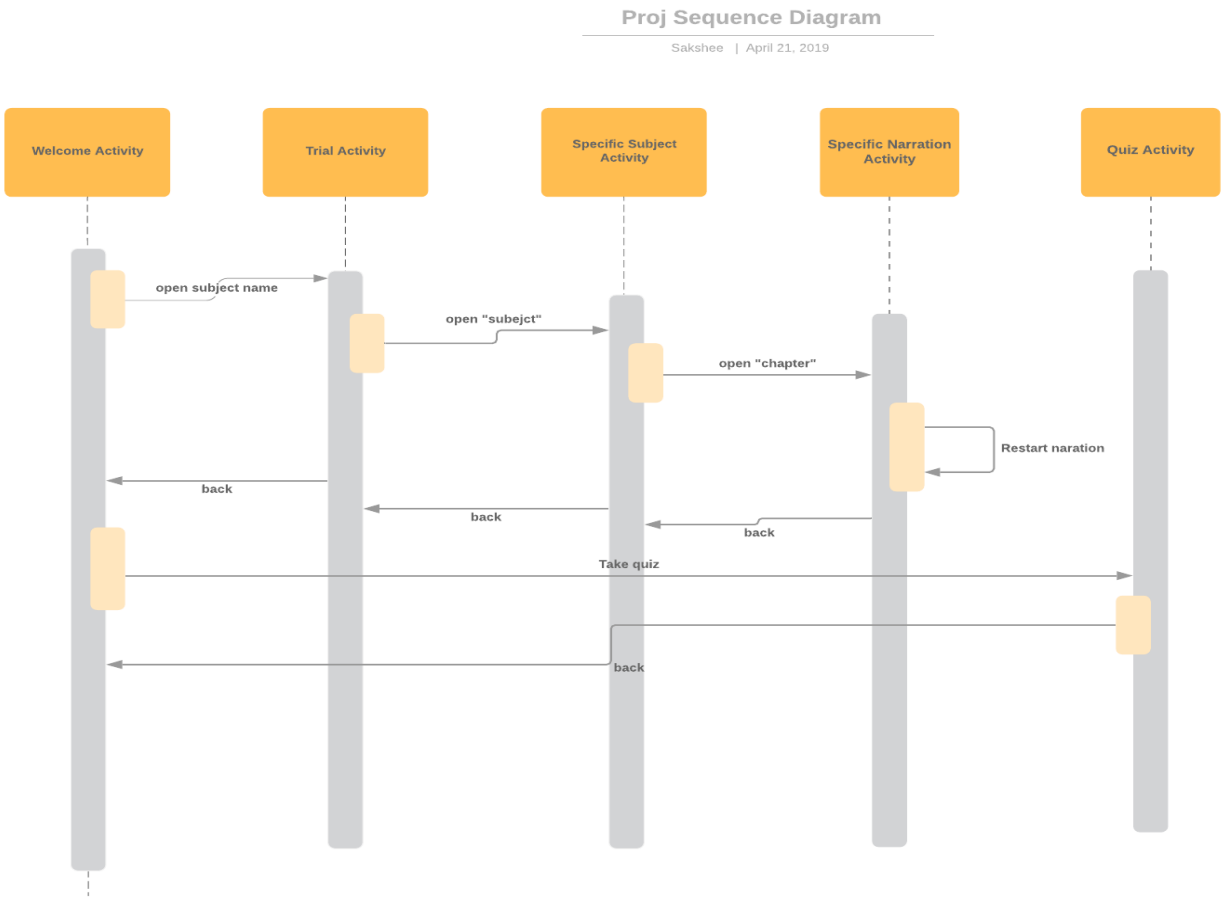


Fig 3

3.3 USE-CASE DIAGRAM

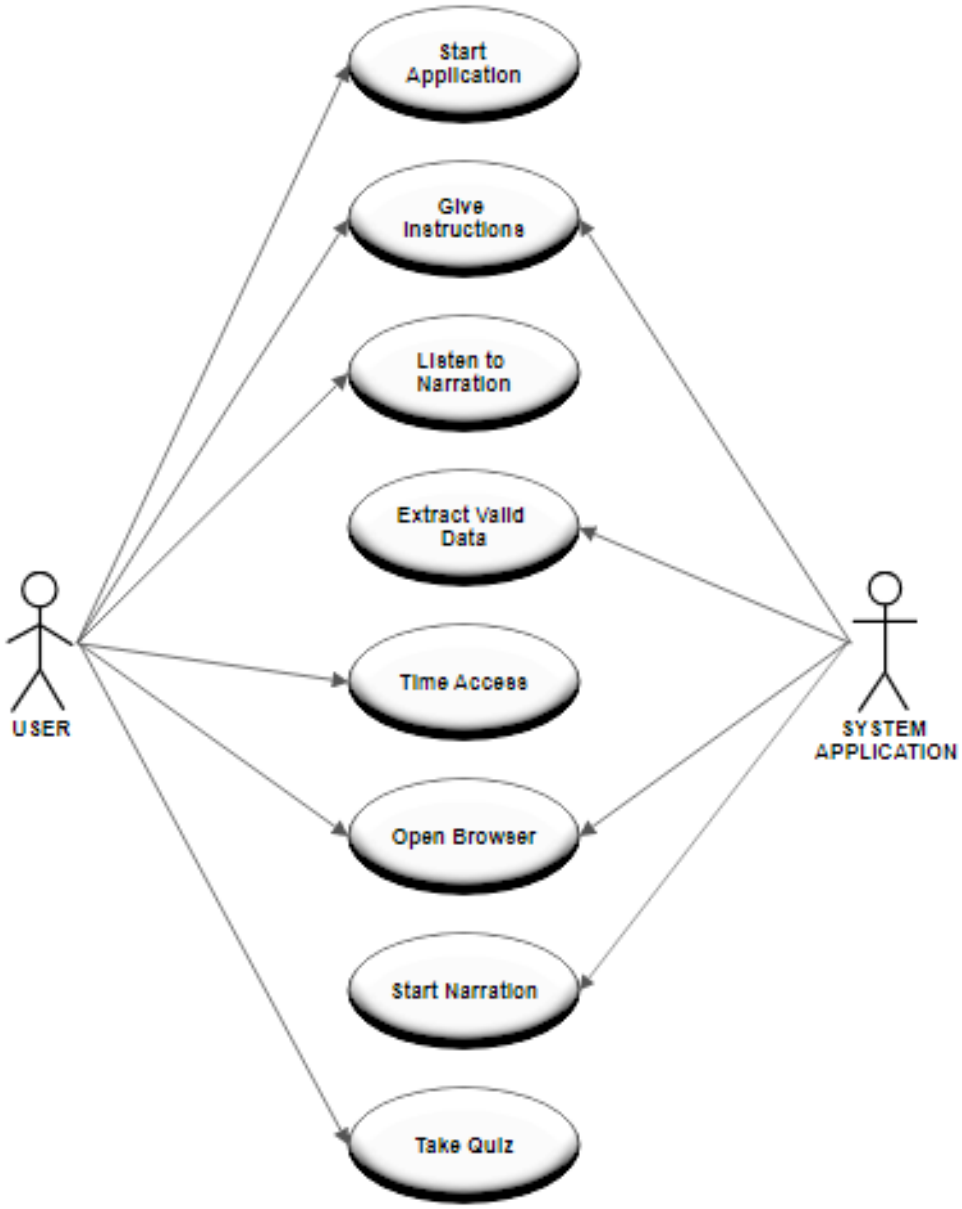


Fig 4

4. IMPLEMENTATION

4.1 CODING

4.1.1 MouseControl.m

```
function MouseControl(redThresh, greenThresh, blueThresh, numFrame)
warning('off','vision:transition:usesOldCoordinates');

%% Initialization
if nargin < 1
    redThresh = 0.22;  % Threshold for Red color detection
    greenThresh = 0.14; % Threshold for green color detection
    blueThresh = 0.18; % Threshold for blue color detection
    numFrame = 1000; % Total number of frames duration
end

cam = imaqhwinfo; % Get Camera information
cameraName = char(cam.InstalledAdaptors(end));
cameraInfo = imaqhwinfo(cameraName);
cameraId = cameraInfo.DeviceInfo.DeviceID;
cameraFormat = cameraInfo.DeviceInfo.DefaultFormat;

jRobot = java.awt.Robot; % Initialize the JAVA robot
vidDevice = imaq.VideoDevice(cameraName, cameraId, cameraFormat, ... % Input
Video from current adapter
                    'ReturnedColorSpace', 'RGB');

vidInfo = imaqhwinfo(vidDevice);  % Acquire video information
screenSize = get(0,'ScreenSize'); % Acquire system screensize
hblob = vision.BlobAnalysis('AreaOutputPort', false, ... % Setup blob
analysis handling
                                'CentroidOutputPort', true, ...
                                'BoundingBoxOutputPort', true', ...
                                'MaximumBlobArea', 3000, ...
                                'MinimumBlobArea', 100, ...
                                'MaximumCount', 3);
hshapeinsBox = vision.ShapeInserter('BorderColorSource', 'Input port', ... %
Setup colored box handling
                                    'Fill', true, ...
                                    'FillColorSource', 'Input port', ...
                                    'Opacity', 0.4);
hVideoIn = vision.VideoPlayer('Name', 'Final Video', ... % Setup output video
stream handling
                                'Position', [100 100 vidInfo.MaxWidth+20
vidInfo.MaxHeight+30]);
nFrame = 0; % Initializing variables
lCount = 0; rCount = 0; dCount = 0;
sureEvent = 5;
iPos = vidInfo.MaxWidth/2;
```

```
%% Frame Processing Loop
while (nFrame < numFrame)
    rgbFrame = step(vidDevice); % Acquire single frame
    rgbFrame = flipdim(rgbFrame,2); % Flip the frame for userfriendliness
    diffFrameRed = imsubtract(rgbFrame(:,:,1), rgb2gray(rgbFrame)); % Get red
components of the image
    binFrameRed = im2bw(diffFrameRed, redThresh); % Convert the image into
binary image with the red objects as white
    [centroidRed, bboxRed] = step(hblob, binFrameRed); % Get the centroids
and bounding boxes of the red blobs

    diffFrameGreen = imsubtract(rgbFrame(:,:,2), rgb2gray(rgbFrame)); % Get
green components of the image
    binFrameGreen = im2bw(diffFrameGreen, greenThresh); % Convert the image
into binary image with the green objects as white
    [centroidGreen, bboxGreen] = step(hblob, binFrameGreen); % Get the
centroids and bounding boxes of the blue blobs

    diffFrameBlue = imsubtract(rgbFrame(:,:,3), rgb2gray(rgbFrame)); % Get
blue components of the image
    binFrameBlue = im2bw(diffFrameBlue, blueThresh); % Convert the image into
binary image with the blue objects as white
    [~, bboxBlue] = step(hblob, binFrameBlue); % Get the centroids and
bounding boxes of the blue blobs

    if length(bboxRed(:,1)) == 1 % Mouse pointer movement routine
        jRobot.mouseMove(1.5*centroidRed(:,1)*screenSize(3)/vidInfo.MaxWidth,
1.5*centroidRed(:,2)*screenSize(4)/vidInfo.MaxHeight);
    end
    if ~isempty(bboxBlue(:,1)) % Left Click, Right Click, Double Click
routine
        if length(bboxBlue(:,1)) == 1 % Left Click routine
            lCount = lCount + 1;
            if lCount == sureEvent % Make sure of the left click event
                jRobot.mousePress(16);
                pause(0.1);
                jRobot.mouseRelease(16);
            end
        elseif length(bboxBlue(:,1)) == 2 % Right Click routine
            rCount = rCount + 1;
            if rCount == sureEvent % Make sure of the right click event
                jRobot.mousePress(4);
                pause(0.1);
                jRobot.mouseRelease(4);
            end
        elseif length(bboxBlue(:,1)) == 3 % Double Click routine
            dCount = dCount + 1;
            if dCount == sureEvent % Make sure of the double click event
                jRobot.mousePress(16);
                pause(0.1);
                jRobot.mouseRelease(16);
                pause(0.2);
                jRobot.mousePress(16);
```

```
                pause(0.1);
                jRobot.mouseRelease(16);
            end
        end
    else
        lCount = 0; rCount = 0; dCount = 0; % Reset the sureEvent counter
    end
    if ~isempty(bboxGreen(:,1)) % Scroll event routine
        if (mean(centroidGreen(:,2)) - iPos) < -2
            jRobot.mouseWheel(-1);
        elseif (mean(centroidGreen(:,2)) - iPos) > 2
            jRobot.mouseWheel(1);
        end
        iPos = mean(centroidGreen(:,2));
    end
    vidIn = step(hshapeinsBox, rgbFrame, bboxRed,single([1 0 0])); % Show the
red objects in output stream
    vidIn = step(hshapeinsBox, vidIn, bboxGreen,single([0 1 0])); % Show the
green objects in output stream
    vidIn = step(hshapeinsBox, vidIn, bboxBlue,single([0 0 1])); % Show the
blue objects in output stream
    step(hVideoIn, vidIn); % Output video stream
    nFrame = nFrame+1;
end
%% Clearing Memory
release(hVideoIn); % Release all memory and buffer used
release(vidDevice);
clc;
end
```

4.1.2 camcheck.m

```
function [ camera_name, camera_id, resolution ] = camcheck()

display('Camera Check Started');
a=imaqhwinfo%a gets the hardware information
c=imaqhwinfo('winvideo')%here c stores winvideo info selected
b=c.DeviceIDs %here b gets the no of camera output devices

camera_name = char(a.InstalledAdaptors(1))
[p,q]=size(b)

if (q==0)
nohw= errordlg('No Compatible Hardware Found','ERROR' );%error if no Hardware
else
switch q,
    case 1,
camera_name = char(a.InstalledAdaptors(end));
camera_info = imaqhwinfo(camera_name);
camera_id = camera_info.DeviceInfo(1).DeviceID(end);
resolution = char(camera_info.DeviceInfo(1).SupportedFormats(end));
    case 2,

hw2= questdlg('Select Device For Input Video', ...
```

```
'Select The Input Device', ...
c.DeviceInfo(1).DeviceName,c.DeviceInfo(2).DeviceName,c.DeviceInfo(1).DeviceN
ame );
if strcmp(hw2 , c.DeviceInfo(1).DeviceName)==1
    camera_name = char(a.InstalledAdaptors);
    camera_info = imaqhwinfo(camera_name);

camera_id = camera_info.DeviceInfo(1).DeviceID(end);
resolution = char(camera_info.DeviceInfo(1).SupportedFormats(end));

else    if strcmp(hw2,c.DeviceInfo(2).DeviceName)==1
        camera_name = char(a.InstalledAdaptors(end));
        camera_info = imaqhwinfo(camera_name);
camera_id = camera_info.DeviceInfo(2).DeviceID(end);
resolution = char(camera_info.DeviceInfo(2).SupportedFormats(end));
end
end

case 3,

hw2= questdlg('Select Device For Input Video', ...
'Select The Input Device', ...
c.DeviceInfo(1).DeviceName,c.DeviceInfo(2).DeviceName,c.DeviceInfo(3).DeviceN
ame,c.DeviceInfo(1).DeviceName );
if  strcmp(hw2,c.DeviceInfo(1).DeviceName)==1
    camera_name = char(a.InstalledAdaptors(end));
    camera_info = imaqhwinfo(camera_name);
camera_id = camera_info.DeviceInfo(1).DeviceID(end);
resolution = char(camera_info.DeviceInfo(1).SupportedFormats(end));
end
if strcmp(hw2,c.DeviceInfo(2).DeviceName)==1
    camera_name = char(a.InstalledAdaptors(end));
    camera_info = imaqhwinfo(camera_name);
camera_id = camera_info.DeviceInfo(2).DeviceID(end);
resolution = char(camera_info.DeviceInfo(2).SupportedFormats(end));
end
if strcmp(hw2,c.DeviceInfo(3).DeviceName)==1
    camera_name = char(a.InstalledAdaptors(end));
    camera_info = imaqhwinfo(camera_name);
camera_id = camera_info.DeviceInfo(3).DeviceID(end);
resolution = char(camera_info.DeviceInfo(3).SupportedFormats(end));
end
end % switch
end
end
```

4.1.3 detectcolor.m

```
% Function that detects the center of color
%finding centroid and returning coordinates
function x = detectcolor (image,h,s,v)
% Convert the RGB color space image to an HSV
% color space format image
image = rgb2hsv(image);
```

```
% Threshold the HSV color space image to an
% binary image
image = hsv2binary(image,h,s,v);
% Label all the connected components in the
% thresholded binary image
cc = bwconncomp(image);
% Mesures the centroid for each all the
% connected components
color = regionprops(cc,'Centroid');
% If there is no connected components, return
% an empty vector
if isempty(color)
x = [];
% If the is one or more connected componentes,
% return the centroid of the biggest one
else
numPixels = cellfun(@numel,cc.PixelIdxList);
[~,idx] = max(numPixels);
x(1) = color(idx).Centroid(1);
x(2) = color(idx).Centroid(2);
end
end
```

4.1.4 hsv2binary.m

```
% Function that converts a color image into a binary
% image such that the pixels that are in specified
% color range become 1 and all others become 0
function output = hsv2binary(input,h,s,v)
output = input(:,:,1)>=h(1)&input(:,:,1)<=h(2)&...
input(:,:,2)>=s(1)&input(:,:,2)<=s(2)&...
input(:,:,3)>=v(1)&input(:,:,3)<=v(2);
end
```

4.1.5 movems.m

```
function [ output_args ] = movems( x,y)
%import java robot class
import java.awt.Robot;
%create a robot object mouse
mouse = Robot;
% move mouse to desired location
mouse.mouseMove(3.5*x-350,2.7*y-270);
end
```

5. RESULTS AND DISCUSSION

5.1 ASSETS- DATA COLLECTION

In the object tracking application one of the main problems is object detection. Instead of finger tips, a color pointer has been used to make the object detection easy and fast. A circle blue sticker is used as a color pointer in this study. To simulate the click events of the mouse, three fingers serving as three color pointers has been used.

- Set a pointer in the image
- Detect the pointer using the defined color information.
- Define the region and the center of the pointer and draw a bounding box around it.
- Track the motion of the pointer.
- Move the cursor according to the position of the center of the pointer.
- Simulate the single and the double left click and the right click of the mouse.

5.2 MAIN MENU

In VisualEyes, the very first page is the main menu and it has the following Icons/Functions in it. With these Functions, come a set of instructions which are narrated to the user for better use of the application. The narration is given below. A woman with an Indian Accent narrates the following in “Normal” speed.

5.2.1 MENU-INFLATER

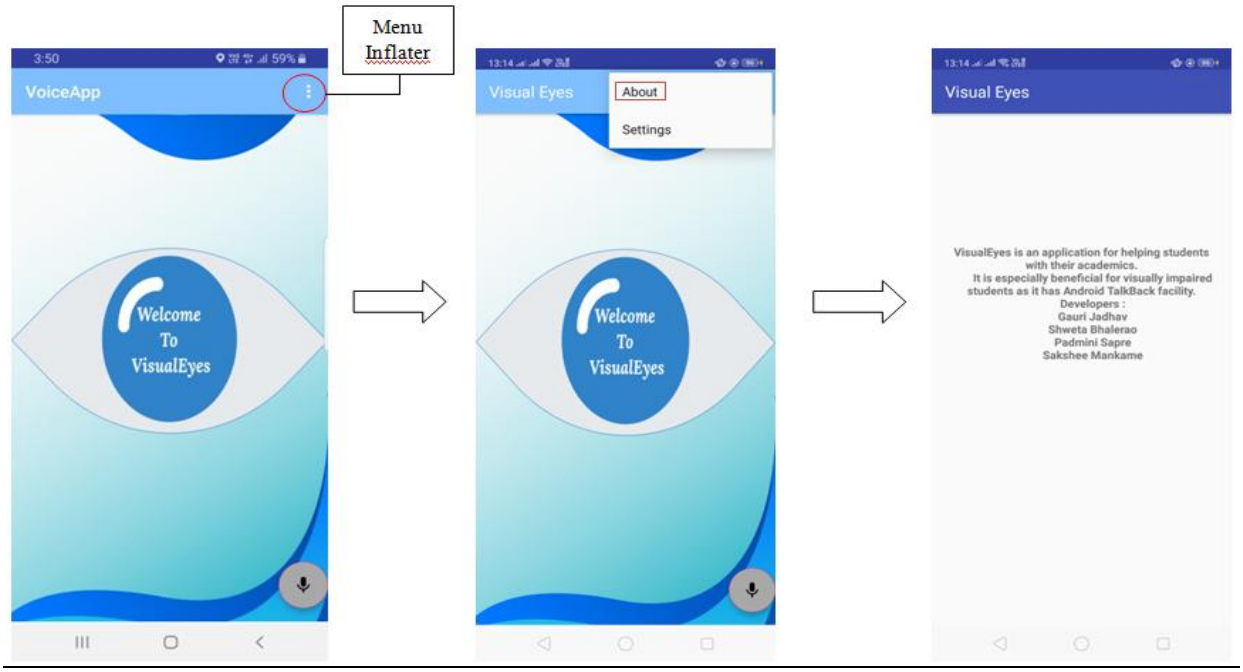
A MenuInflater is an object that is able to create Menu from xml resources, that is : construct a new instance of Menu given a menu resource identifier.

The onCreateOptionMenu(Menu) is called when the menu button of the device is pressed, or either Activity.openOptionsMenu() is called.
The actual rendering of the menu is handled by the activity. Just before it is shown, the Activitypasses to you the menu so that you can fill it with your own items, then shows it. So Android undertakes that since it's not your business to render the menu, you shall not control what menu is actually passed to you inside onCreateOptionsMenu.

In VisualEyes, the Menu made by using the MenuInflater consists of :

i. **Settings:** The Setting option remind's the user to give microphone permission.

ii. **About**: This Menu Option tells the user about the Application's Developers and the application's uses.



5.2.2 FIGMA SOFTWARE

Figma is a web-based design tool with real-time collaboration**.** It's like Craft Freehand but with all the features of Sketch (and more). It works in web browsers, and there are also native applications that let you work offline. Figma has a clickable prototyping feature that's similar to Craft + InVision . You can even embed Figma projects in Dropbox Paper. Its components are similar to Symbols in Sketch, but more flexible and easier to design with. Its Benefits and properties are as follows.

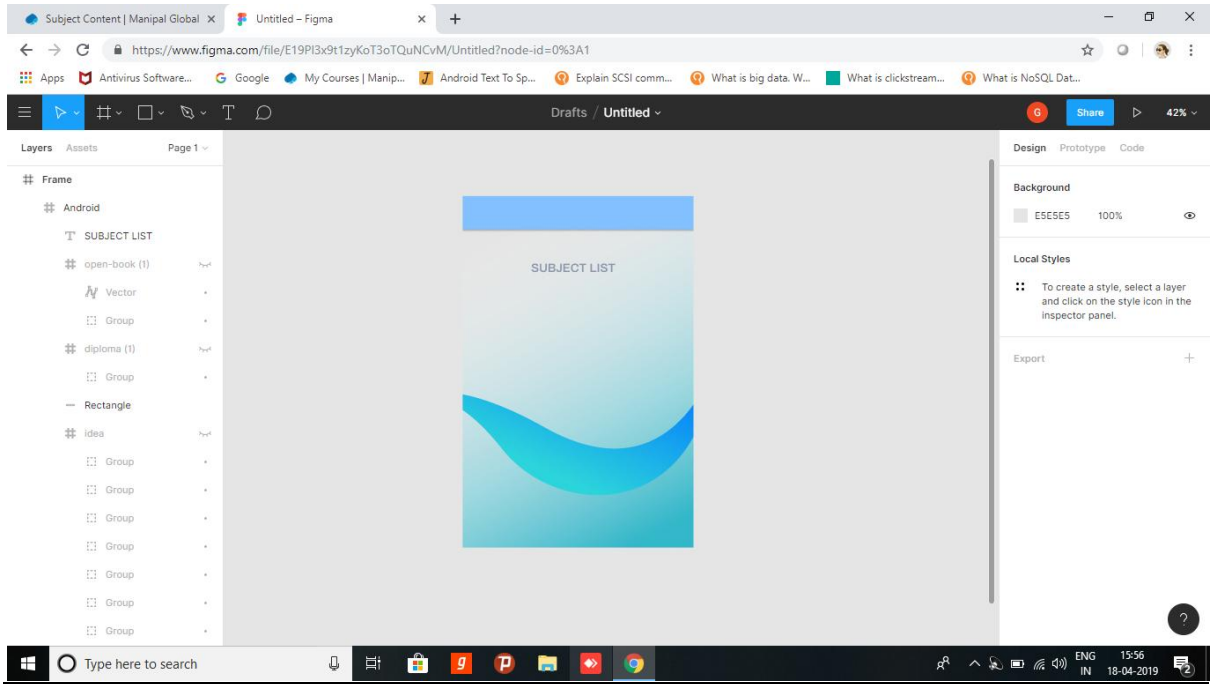
- **Built-in Commenting**. Anyone with the link can add comments anywhere on the design, similar to how commenting works in InVision. You can tag people in comments, mark comments as resolved, and even integrate with Slack.

- **Developer Handoff.** Devs can get dimensions, styles, and download icons and images from the project URL. It's like Zeplin, but again, you don't have to sync your artboards whenever you update your designs.

- **Version Control.** Figma includes version history for all collaborators. You can roll back to or fork from a previous state. This works like time machine on a Mac.

- **Multiplayer Collaboration**. Multiple people can collaborate in real time. Similar to Freehand, we all see each other's cursors on the screen and can draw things and make comments.

- **Constraints and Team Libraries.** Similar to Resizing in Sketch, but more intuitive. . You can share and update collections of components across projects.



5.2.3 FLOATING ACTION BUTTON

Floating action buttons (or **FAB**) are: “A special case of promoted actions. They are distinguished by a circled icon floating above the UI and have special motion behaviors, related to morphing, launching, and its transferring anchor point.”For example, if we are using an email application and we are listing the inbox folder, the promoted action might be composing a new message. FABs come in three types: regular, mini, and extended.

In the VisualEyes Android application, the floating action button is used for Microphone, and only works when permission access is given to the device for using the microphone. When this FAB is pressed, a bip sound is produced after which the device application starts listening to the user and acts accordingly.

5.3 COMMANDS AND KEYWORDS

5.3.1 MAIN KEYWORDS

KEYWORD	USAGE
OPEN SUBJECT NAME	Opens the subject list
OPEN <SUBJECT NAME>	Opens that particular subject
OPEN <SUBJECT NAME-CHAPTER NUMBER>	Opens that particular chapter from that subject
OPEN QUIZ	Opens Quiz Activity
Take Quiz <no.>	Opens the desired Quiz
Play	Starts/Resumes Audio Clip
Pause	Pauses Audio Clip

5.3.2- ADDITIONAL KEYWORDS

KEYWORD	ACTION
“What is your Name?”	“My name is VisualEyes”
“What is the time?”	“The Time is <time>”
“Open Browser”	<Opens the browser>

WHAT IS YOUR NAME?

This command allows the application to say its name. In our project we have named our application “VIsiualEyes, so the application prompts “My name is VIsualEyess”.

WHAT IS THE TIME?

This command allows the application to say the current time to the user.

OPEN BROWSWER

This Command allows the application to open Google Chrome Directly from the application.

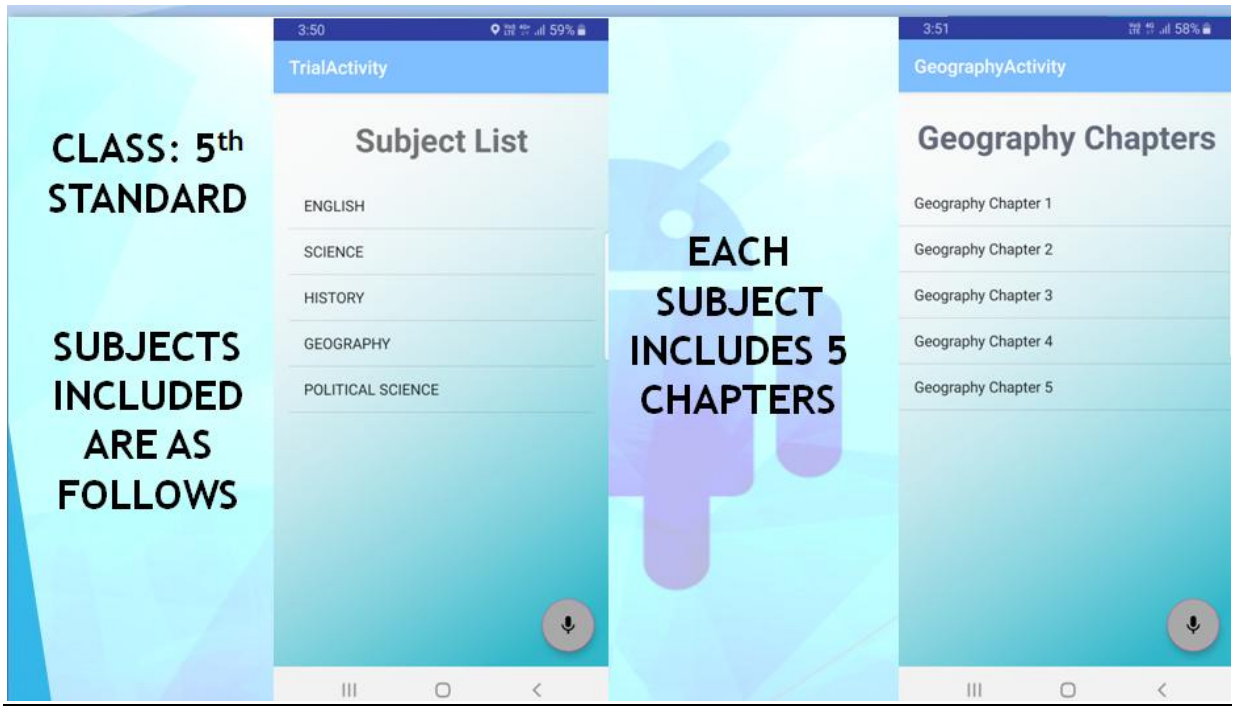
THE CODE TO IMPLEMENT THE ABOVE IS AS FOLLOWS:

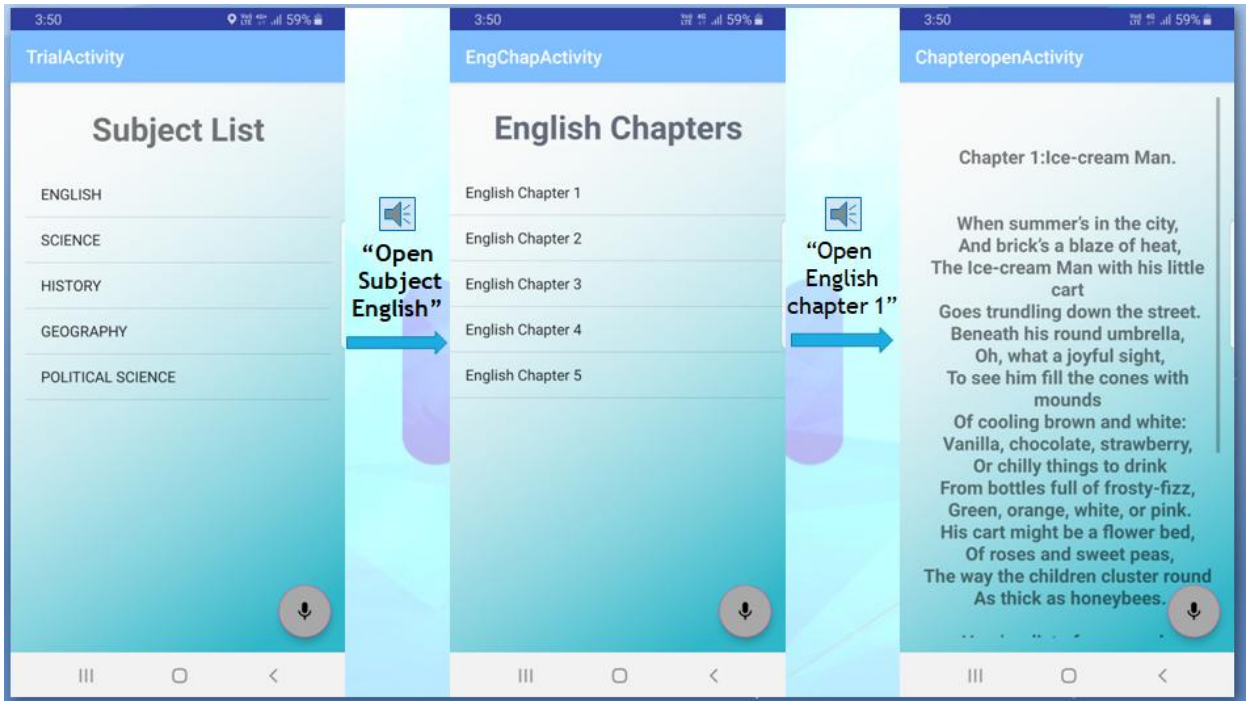
```
FloatingActionButton fabmic = (FloatingActionButton) findViewById(R.id.fabmic);
      fabmic.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View view) {
            Intent intent = new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
            intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE_MODEL,
RecognizerIntent.LANGUAGE_MODEL_FREE_FORM);
            intent.putExtra(RecognizerIntent.EXTRA_MAX_RESULTS, 1);
            myTTS.stop();
            mySpeechRecognizer.startListening(intent);
         }
      });
initializeTextToSpeech();
      initializeSpeechRecognizer();
 private void initializeSpeechRecognizer() {
      if (SpeechRecognizer.isRecognitionAvailable(this)){
         mySpeechRecognizer = SpeechRecognizer.createSpeechRecognizer(this);
         mySpeechRecognizer.setRecognitionListener(new RecognitionListener() {

            @Override
            public void onReadyForSpeech(Bundle bundle) {
            }

            @Override
            public void onBeginningOfSpeech() {
            }

            @Override
            public void onRmsChanged(float v) {
            }

            @Override
            public void onBufferReceived(byte[] bytes) {
            }

            @Override
            public void onEndOfSpeech() {
            }

            @Override
            public void onError(int i) {
```

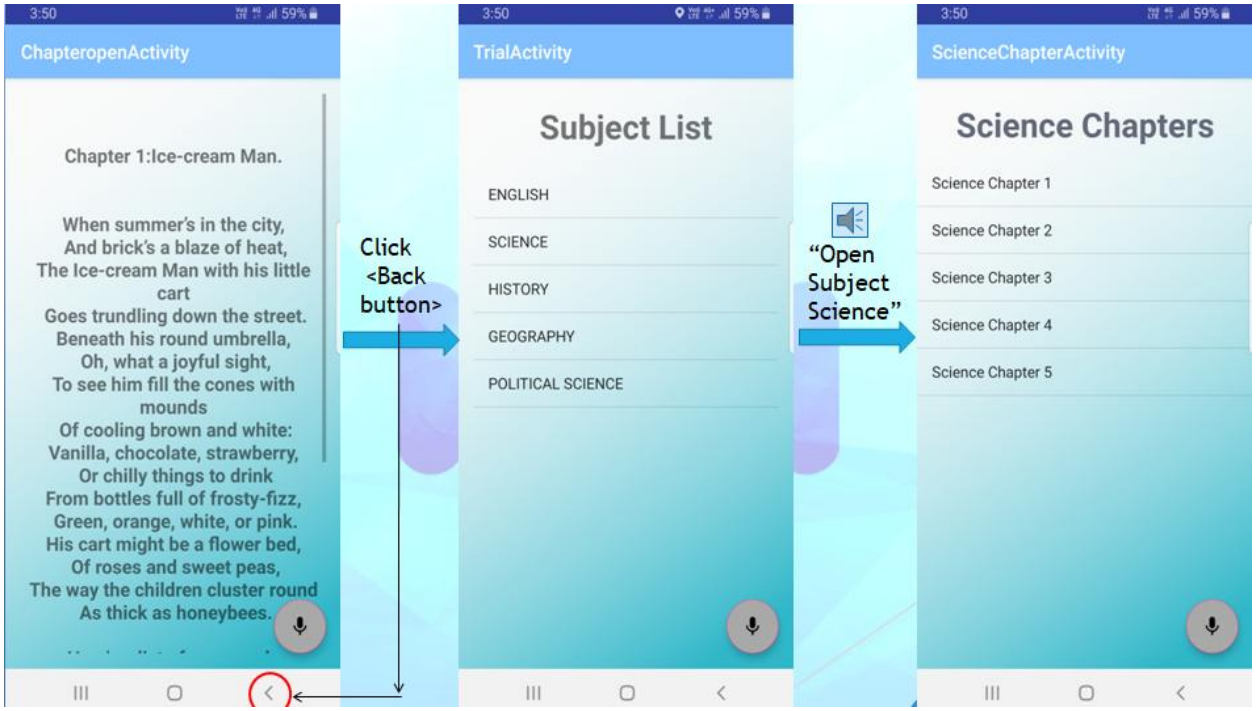
```
            }

            @Override
            public void onResults(Bundle bundle) {
                List<String> results =
bundle.getStringArrayList(SpeechRecognizer.RESULTS_RECOGNITION);
                processResult(results.get(0));

            }

            @Override
            public void onPartialResults(Bundle bundle) {

            }

            @Override
            public void onEvent(int i, Bundle bundle) {

            }
        });
    }
  }

  private void processResult(String command) {
    command = command.toLowerCase();
    if(command.indexOf("back") !=-1){
        speak("App Closing");
        android.os.Process.killProcess(android.os.Process.myPid());
        System.exit(1);
    }

    if(command.indexOf("what") != -1){
        if(command.indexOf("your name") != -1){
            speak("My name is Visualize.");
        }
        if (command.indexOf("time") != -1){
            Date now = new Date();
            String time = DateUtils.formatDateTime(this, now.getTime(),
DateUtils.FORMAT_SHOW_TIME);
            speak("The time is " + time);
        }
    } else if(command.indexOf("open") != -1){
        if(command.indexOf("browser") != -1){
            Intent intent = new Intent(Intent.ACTION_VIEW, Uri.parse("https://google.com"));
            startActivity(intent);
        }
```

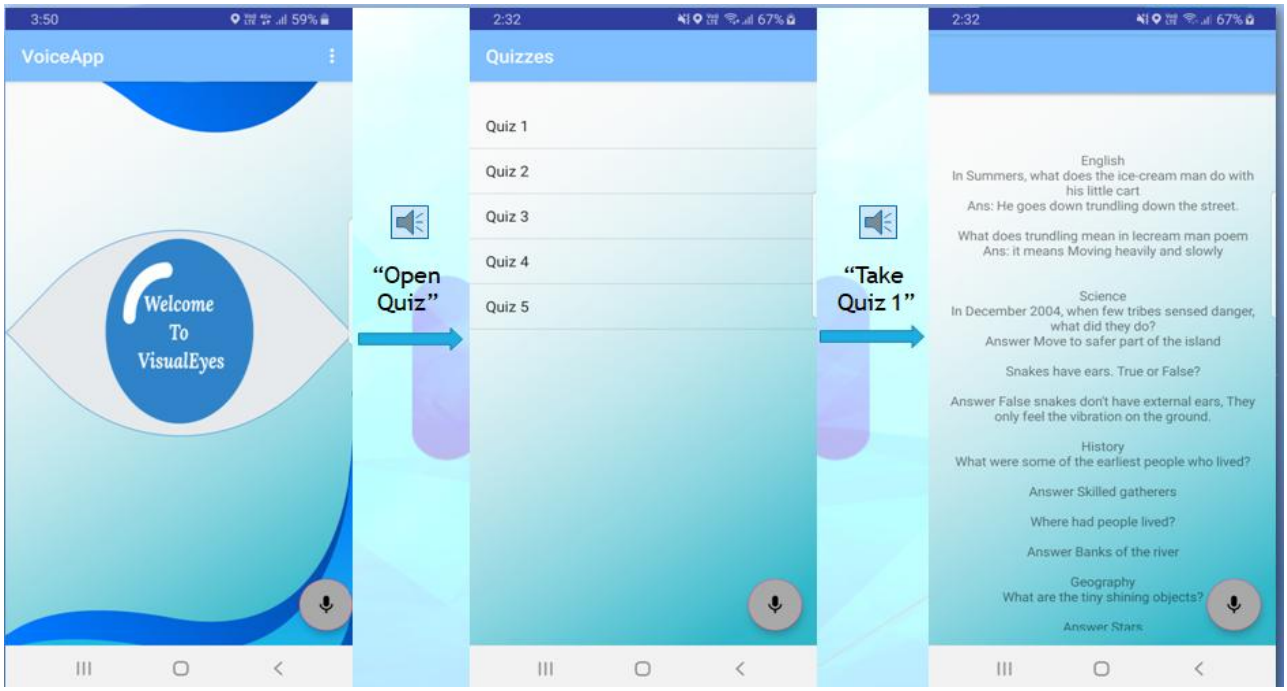
```
 private void speak(String message) {
      HashMap<String,String> myHash=new HashMap<String, String>();
      myHash.put(TextToSpeech.Engine.KEY_PARAM_UTTERANCE_ID,"done");
      String[] splitSpeech= message.split(".");
      for (int i=0;i<splitSpeech.length;i++)
      {
         if (i==0){

myTTS.speak(splitSpeech[i].toString().trim(),TextToSpeech.QUEUE_FLUSH,myHash);
         }
         else {
            myTTS.speak(splitSpeech[i].toString().trim(),TextToSpeech.QUEUE_ADD,myHash);
         }
      }
      if(Build.VERSION.SDK_INT >= 21) {
         myTTS.speak(message, TextToSpeech.QUEUE_FLUSH, null, null);
      }
      else {
         myTTS.playSilence(1000,TextToSpeech.QUEUE_ADD,null);
      }
   }
```

5.4 SCREENSHOTS


CLASS: 5th STANDARD
SUBJECTS INCLUDED ARE AS FOLLOWS
TrialActivity
Subject List
ENGLISH
SCIENCE
HISTORY
GEOGRAPHY
POLITICAL SCIENCE
EACH SUBJECT INCLUDES 5 CHAPTERS
GeographyActivity
Geography Chapters
Geography Chapter 1
Geography Chapter 2
Geography Chapter 3
Geography Chapter 4
Geography Chapter 5


TrialActivity
Subject List
ENGLISH
SCIENCE
HISTORY
GEOGRAPHY
POLITICAL SCIENCE
"Open Subject English"
EngChapActivity
English Chapters
English Chapter 1
English Chapter 2
English Chapter 3
English Chapter 4
English Chapter 5
"Open English chapter 1"
ChapteropenActivity
Chapter 1:Ice-cream Man.
When summer's in the city,
And brick's a blaze of heat,
The Ice-cream Man with his little cart
Goes trundling down the street.
Beneath his round umbrella,
Oh, what a joyful sight,
To see him fill the cones with mounds
Of cooling brown and white:
Vanilla, chocolate, strawberry,
Or chilly things to drink
From bottles full of frosty-fizz,
Green, orange, white, or pink.
His cart might be a flower bed,
Of roses and sweet peas,
The way the children cluster round
As thick as honeybees.


ChapteropenActivity
Chapter 1:Ice-cream Man.
When summer's in the city,
And brick's a blaze of heat,
The Ice-cream Man with his little cart
Goes trundling down the street.
Beneath his round umbrella,
Oh, what a joyful sight,
To see him fill the cones with mounds
Of cooling brown and white:
Vanilla, chocolate, strawberry,
Or chilly things to drink
From bottles full of frosty-fizz,
Green, orange, white, or pink.
His cart might be a flower bed,
Of roses and sweet peas,
The way the children cluster round
As thick as honeybees.
Click <Back button>
TrialActivity
Subject List
ENGLISH
SCIENCE
HISTORY
GEOGRAPHY
POLITICAL SCIENCE
"Open Subject Science"
ScienceChapterActivity
Science Chapters
Science Chapter 1
Science Chapter 2
Science Chapter 3
Science Chapter 4
Science Chapter 5


VoiceApp
Welcome To VisualEyes
"Open Quiz"
Quizzes
Quiz 1
Quiz 2
Quiz 3
Quiz 4
Quiz 5
"Take Quiz 1"
English
In Summers, what does the ice-cream man do with his little cart
Ans: He goes down trundling down the street.
What does trundling mean in Icecream man poem
Ans: it means Moving heavily and slowly
Science
In December 2004, when few tribes sensed danger, what did they do?
Answer Move to safer part of the island
Snakes have ears. True or False?
Answer False snakes don't have external ears, They only feel the vibration on the ground.
History
What were some of the earliest people who lived?
Answer Skilled gatherers
Where had people lived?
Answer Banks of the river
Geography
What are the tiny shining objects?
Answer Stars

6. CONCLUSION

6.1 CONCLUSION

- The system architecture that has been proposed will completely change the approach Education System for Visually Impaired. Presently, the Braille Scripts make it a tedious job and limits the reach of students.

- This project will eliminate the necessity of using Braille Scripts. Also this would lead to a new era of Education system for visually impaired where no tedious work will be included..

- The use of Talk-Back facility, Text-to-Speech and Speech Recognition Facility used for the implementation of our proposed work proved to be practically successful with good precision accuracy.

- This technology can be used to help students who are visually challenged who are scared of using android phones because of the same reason

6.2 LIMITATIONS

Since the application is supports free form speech input system, it does not hear continuously but a floating button needs to be pressed for it. The implementation of this API is likely to stream audio to remote servers to perform speech recognition. As such this API is not intended to be used for continuous recognition, which would consume a significant amount of battery and bandwidth.

The application might run slower on certain devices with low computational capabilities because of its large size which involves a lot of data and small amount of time to compute it. However, if provided with standard pc or laptop that has the required computational power cloud server, this drawback can be managed.

Also, the files in this application are not downloadable. As well as in the Quiz section, the answers are not jotted down by the application. But in future, these drawbacks can be overcomed.

6.3 FEASIBILITY STUDY AND REPORT

A feasibility study is an analysis of how successfully a project can be completed, accounting for factors that affect it such as economic, technological, legal and scheduling factors. Project managers use feasibility studies to determine potential positive and negative outcomes of a project before investing a considerable amount of time and money into it.

The feasibility study focuses on helping to answer the essential question of- **"**Should we proceed with the proposed project idea?**"** All activities of the study are directed toward helping answer this question.

The information you gather and present in your feasibility study will help you:

- Identify all the things you need to make the project work in real-time world.
- Pinpoint other project-related problems and solutions.
- Develop strategies to convince the Project Head that you're proposed. Solution is worth considering for the given problem statement.
- Serve as a solid foundation for developing your project plan.

Following can be the types of Feasibilities involved in this project.

6.3.1 Technical Feasibility
6.3.2 Economic Feasibility
6.3.3 Operational Feasibility
6.3.4 Time Feasibility

6.3.1 Technical Feasibility

- Our application as a project will be developed by keeping in mind that only the recent technology should be used for development and testing its purpose since the project is based on a sensitive issue.
- It has to be developed on a technology that can reach out to majority of general masses such as for Android or iOS based devices.
- An application must be intelligent enough to interpret what the user wants and provide it accordingly. It should also be completely usable by other non-visually impaired users.
- The application has to be developed with a view to make life simpler and studying less complex for blind users
- Any minute software malfunction or processing delay can cause undesirable or unsatisfactory response.

6.3.2 Economic Feasibility

- Our application will be developed as a part of the project work, so there are no considerable costs to be incurred for the proposed solution.
- Overall the project budget will be cost-efficient to best serve the purpose.
- Resources such as an Integrated Development Environment (IDE), Back-end databases such as MySQL, Firebase, Application Programming Interfaces (APIs), Software Development Kit (SDK) or systems required to actually develop an application are readily available with the project team for free of cost.

6.3.3 Operational Feasibility

- Every team member had clearly analyzed the problem statement by taking into consideration various problem aspects through **"**Root-cause analysis**"** so as to understand the problem in-depth and identify the shortcomings in the existing system.
- We as a team had been working over on such real-time issues from the past and therefore we share a good bond with each other, have been earning project development experiences, respect each other**'**s working practices and can work in co-ordination and with mutual understanding.
- These above factors ensure that our team would be able to successfully deliver the proposed solution and manage technical difficulties and project risks effectively through our experiences and skills.

6.3.4 Time Feasibility

- Time plays a crucial role in developing a project and making it available for your clients within the estimated deadlines.
- Every task needs to be completed and assessed within a prescribed duration so that proper testing procedures could be carried out to identify flaws.
- Any delay in the project development and testing procedures could incur extra costs and can compromise the estimated quality of the application in the due process of delivering the product under time constraint.

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