Faculty of Business & Information Science (School of IT)

Undergraduate Degree Programme

Student ID:	1913026
Student Name:	Ojaswi Shiwakoti
Supervisor / Second Marker :	Mr.Subit Timalsina
Date :	2022, 24th nov

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Google's Android operating system is used on a lot of phones and tablets these days, and there are millions of users all over the world. This operating system is widely used because it can handle multiple tasks at once, is easy to use, and works with a lot of different kinds of hardware. "Speech to Action" is an app for Android that is made for people who want to improve their public speaking skills and for disabled people who can't or have trouble writing on a keyboard. The user should be able to say out loud the instructions and symbols that their software needs. The voice-recognition system in the app sends a word to the program, which is designed to pick up keywords. Because these keywords are similar to the word, an app is set up to pick them up. "Speech to Action" has a lot of features that can be accessed from the outside, like reports, top news, and a speech recognizer, so that users can feel like they are interacting with the program. These plug-ins are sent as libraries and pre-coded files. To use them, the main application needs to be changed to make room for them.

Keywords: [Speech to Action, Public speaking, Speech, Application]

INTRODUCTION

1. Context or Background

"Public Speaking" has always been the term for speaking in front of a large group of people. In this field, which was still growing, "public speaking" became the general, usually neutral term for oral communication that didn't involve elocution (Keith, 2008). Today, it includes all kinds of public speaking, such as pre-recorded speeches that can be sent over long distances. Public speaking is helpful for political candidates, a lesson in accounting for people who want to start their own business, or a presentation on best practices for projects for an individual. These people may not do as well at work or school because of their fear, and they often don't speak up in class (Harris, Kemmerling and North, 2002). So, this app is made for people who want to get better at giving presentations and speaking in public.

2. Project Description

The main goal of the project is to make an Android app that helps people who want to improve their public speaking and presentation skills feel more confident when giving a speech. More than 61% of college students in the U.S. say they are afraid to speak in public (Dwyer and Davidson, 2012). Many people might use this software because Android smartphones are more convenient and flexible than any other device. This app not only makes it easier for you to speak in public, but it also helps you feel more confident. People will be able to practice public speaking skills in a safe place with the help of an app. They shouldn't worry, though, that they'll forget their lines or that their peers will judge them. They will feel confident and ready in front of any crowd. An app can help you not only with listening and speaking, but it can also give you tips on how to stand and move your hands while giving a presentation.

3. Current Scenario

Speaking in public can be a very stressful thing to do. Most people are afraid of it, but the best way to learn is in a comfortable place with people who are willing to

help and cheer you on. It lets people build relationships with people in their whole community, which can help a business grow. It doesn't matter at all if a person is a teacher, a businessperson, or a politician.

But in meetings, they have to deal with conferences, online video links, and presentations every day. Public speakers have to learn how to talk to people of all sizes, from small groups to huge halls and auditoriums. The underlying meaning of this change was that public speaking was becoming a form of communication that could be used in many situations and was judged by how well it worked in those situations, rather than being a skill that only a few people—the skilled, the elite, the platform performers—had (Keith, 2008). They have to finish things in a certain amount of time and do the best job they can, or they have to reach certain milestones. Also, studies have shown that the effectiveness of psychological therapies in reducing social and public speaking anxiety varies greatly depending on how it is measured (Ebrahimi, Pallesen, Kenter and Nordgreen, 2019). This is where the Internet comes in handy, because these communication skills are must-haves for business.

We can't promise that all users will get good results and feedback because virtual learning may not be as good as learning in a classroom. Most English and speech and communication departments are happy to teach their students skills, with an emphasis on functional competence (Keith, 2008). Even if a user has used the app a lot, they may still be scared to speak in front of a large group of people.

4. Aims and Objectives

In the modern world, development has had a strong effect on society. It is the basis for any group of people living together. As a society grows, the needs and

ways to meet those needs also grow. It's a useful job for the developer because they have to meet the needs of all the people and society as a whole. So, this topic was given and introduced to make an app called "Speech to Action" for people who really want to get better at public speaking and giving presentations.

Professionally, you need to be able to speak in front of people. It lets you talk to people, sell ideas, and say what you want to say clearly. In the same way, "Speech to Action" will show you how to start and end a speech, as well as how to start it. Here are some of the goals of this application:

- Suggesting the user in developing Vocabulary and Fluency
- Checking and balancing the pauses or breathing stops
- Analyzing speech will ensure that all words are pronounced correctly
- Providing an opportunity to learn how to become a better listener and speaker
- Providing recent top news to engage audience in conversation so that they are not bored
- View the reports and feedback from the system
- To suit public wants or needs, developers must expand their capabilities
- While checking punctuality, it adds some recent words and phrases
- Avoids repetition of words

REVIEW OF LITERATURE

2.1 Research Work

Android is a software package and operating system for mobile devices like smartphones and tablets that is based on the Linux operating system (javatpoint, 2022). It has been made for almost 15 years, first by Google and then by the OHA (Open Handset Alliance). Even though Android code can be written in other languages, Java is the one that has been used the most.

Android is built on an app-level architecture, which means that each app has its own processes that can use the same shared resources that the Android OS provides. With this architecture, applications can have their own lives. These programs are put together into a set of classes, which are then put into packages and shared as separate programs.

According to a study, there are more than 2.6 million apps in the Google Play Store. You can also side load apps from the web (Android Authority, 2022). This operating system is popular because it can handle multiple tasks at once, is easy to use, and works with a wide range of devices. People who can't or have trouble typing on a keyboard can use the Speech Recognition Application for Android. This app lets the user say words out loud and write Java code without using a keyboard.

A survey from May 2013 found that 71% of mobile app developers make apps for Android. Over a billion people are using Android right now (Yu & Yu, 2014). Because it is open source, anyone can use its code as a starting point for community projects. Also, since Google made it and it has its own library, Google Speech Recognition. This study gives an overview of how far the text-to-speech (TTS) system ARTIC (Artificial Talker in Czech) has come in the last ten years of research and development (Sojka, Kopeek, and Pala, 2006). .

Also, researchers have tried for more than 60 years to use machine speech recognition to turn spoken words into written words (SR). It is also called Automatic Speech Recognition (ASR), computer voice recognition, or just Speech-To-Text (STT). Speech recognition by machines is a broad field of study that includes signal

analysis, acoustics, pattern recognition, communication and information theory, linguistics, physiology, computer science, and psychology. (Yu & Gande, 2015).

Google Text-to-Speech is one of Google's most popular text-to-speech synthesis tools, and it can be used to recognize speech. Text-to-Speech lets users not only listen to their translation but also hear the text read out loud. With this feature, users and the Google Translate engine can work together to make translations that are more accurate and take less time. Because of this, this tool has been used to create a library of thousands of words in many languages around the world. This makes it one of the most popular text-to-speech tools used in mobile apps, voice assistants, and other smart devices.

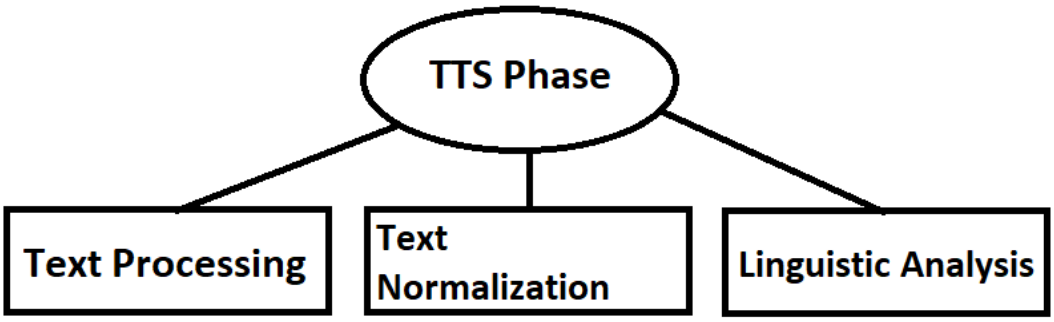


Fig :Text-To-Speech Phase

As shown in the Fig Text-to-Speech has three phases. Its phases has been discussed below:

I. Text Processing

A computer system that can make human speech is called a text-to-speech system or a speech synthesis system. Text-to-speech systems turn normal language text into phonetic representations, which are then spoken by a voice in real time using a digital-to-analog converter.

II. Text Normalization

The point of text normalization is to make the text fit together. When normalization is done right, the output is good. Abbreviations and acronyms are taken care of by the text normalization. For example, the name "Allison Moore" could

be normalized as either "Allison Moore" or "Allison M. Moore," depending on how you want to show it on your website or app.

III. Linguistic Analysis

With the help of accents and the way words are put together, linguistic analysis is used to figure out how a sentence should be spoken. The goals are to get rid of ambiguities in written text and make sure that words are said correctly. It's usually used to mean that a computer tries to figure out what a piece of text or an input means (Linguistic Analysis Explained - Ascribe, 2022).x

So, over the years, research groups, software companies, and open source communities have made a number of TTS systems.

2.2 Libraries

Google Company made Google Speech Library, which is a piece of software. This program has been used a lot in Google PC and Android operating systems. The app lets users write emails and documents in sentences that sound like real speech. It also lets users find voice commands in the form of text and use those commands to do certain things. Also, it helps users very accurately turn speech into text and text into speech. It's made to work best with U.S. English and other major languages like Spanish and French.

After introducing the new technology of deep learning neural networks, Google has achieved an error rate of 8% in 2015, that is the reduction of more than 23% from year 2013 (Këpuska, 2017). At the time, Google Speech Recognition was an innovative program that gave Android platforms many new features. The developer can use its library to dictate a sentence for Google search, and the application will take the input, turn it into text, run Google search, and show the results to the end user. For example, a device user can say what they want to search for on Google, and the app will take that information, turn it into text, and automatically search Google. After that, it shows the user the results, making their experience better and more accurate.

2.3 API

Application Programming Interface (API) is a set of programming languages that make it possible for one piece of software to send data to another piece of software (AltexSoft, 2022). The most common APIs are those for web services, which let your app work with a third-party service without your app having to talk to the service directly. Many modern apps use APIs from other services and websites so they can use data from those sites to do things without having to store it locally.

An API is a tool that lets you call applications, information, and data from outside the application by using codes. This lets users access a lot of data in one place, even if they don't have the right app or software on their device. The Google Speech API is a great tool for making apps, websites, and other things. The library can be added to any website or app to make it easier to control things with your voice. Once it's set up, users can easily give commands and questions to their program by saying a few simple words. The Java API then takes the right action based on what was said. It is best to import the JAR file into the Java class when building an offline speech recognizer that can understand what words are being said and turn them into text (Zigh, et al., 2021).

The news API has been added to the app, so users can now read the news feed directly from their phone, no matter where they are. Since we are the source of news, information, and entertainment for people all over the world. It lets developers get to articles, stories, and categories that they can use for their apps and businesses.

REVIEW OF TECHNOLOGY

In the past few years, mobile technology has improved a lot, making it possible to get information from any device, at any time. Because of this, there is a huge need for software that works well on phones. Modern apps let people stay in touch and

access information from any device, at any time. Estimating software is important to get the most accurate size number and build trust between developers and users. Almost all businesses and people use modern technology to promote good services and make their businesses better. So it's up to the developer to plan and build in a way that makes everything easy to understand and easy to move around. This makes it safer for the user and easier to understand. The products and services are a big part of the "Speech to Action" application, and everything is presented in a professional way. Also, users can choose a specific topic to learn more about something specific. This makes the information available.

3.1 Languages to Code

Both Java and HTML will be used to build this app. The main language used by this app is Java. But HTML is also used to make a user interface that isn't too complicated. The app is really easy to use, and its user interface makes it easy and quick to move between pages and find what you're looking for. The performance of an application is pretty good. When running the service, there are no delays or lags. The user interface for the app is made with jQuery. Frameworks like jQuery are used on the front end to make things look nice and work well together.

3.2 Similar Applications

These requests are for Grammarly, Ummo, Orai, and LikeSo are all apps that work in a similar way. Both Grammarly and Ummo are web-based writing programs that do similar things. Grammarly is all about the grammar, spelling, and punctuation of documents. Ummo can figure out complicated structures and idioms in a phrase by using artificial intelligence. Ummo can be used with Google Docs, Gmail, and Evernote. Orai is another free piece of software that uses AI to make comments and suggestions about written content. LikeSo is a social network that lets people find each other based on the things they have in common or the things they talk about with other people.

3.2.1 Grammarly

Grammarly helps people write better and faster. It helps you find and replace complicated sentences with simpler ones, avoid using the same words over and over, and make sure your spelling, punctuation, and grammar are correct.

Grammarly is a cloud-based typing help that checks spelling, grammar, punctuation, and other writing skills to help people improve. It works like a spell checker for grammar. It helps people improve their writing so that what they write is clear, effective, and free of mistakes.

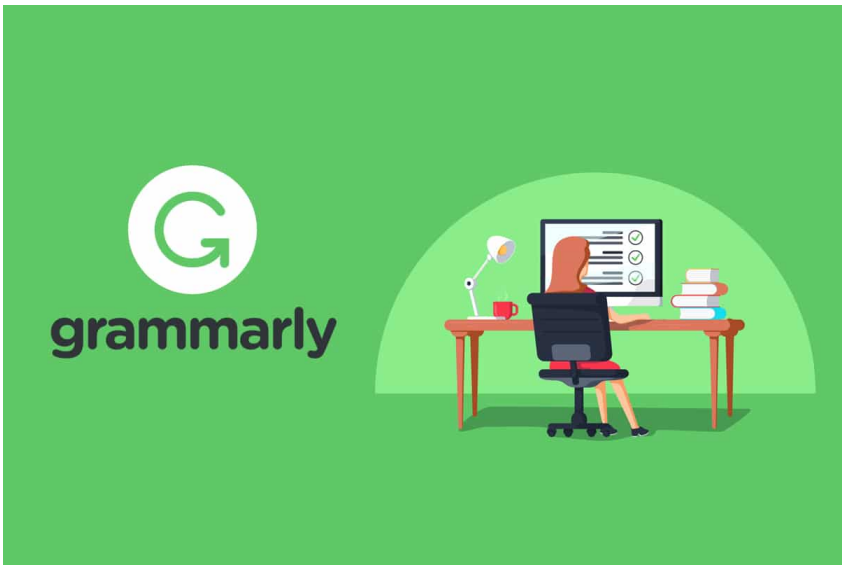


Fig: Similar Application (Grammarly)

3.2.2 Ummo

Ummo is a Personal Speech Coach that can help anyone improve their everyday vocabulary and the way they talk to other people. It is helpful for people who want to prepare for a presentation or improve their communication skills in everyday life. It will help you keep track of filler words, pace, word power, clarity, and other things. To start listening, just click the record button, and to stop, click it again.

Ummo is the most advanced speech analysis tool with a mobile app that is also simple and easy to use. It uses cutting-edge Speech Recognition and Speech Analysis algorithms to figure out the user's Speech Fitness at the word level. It listens to what users say and gives them feedback that is specific to them.

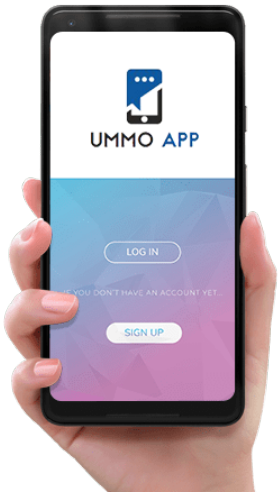


Fig: Similar Application (Ummo)

3.2.3 Orai

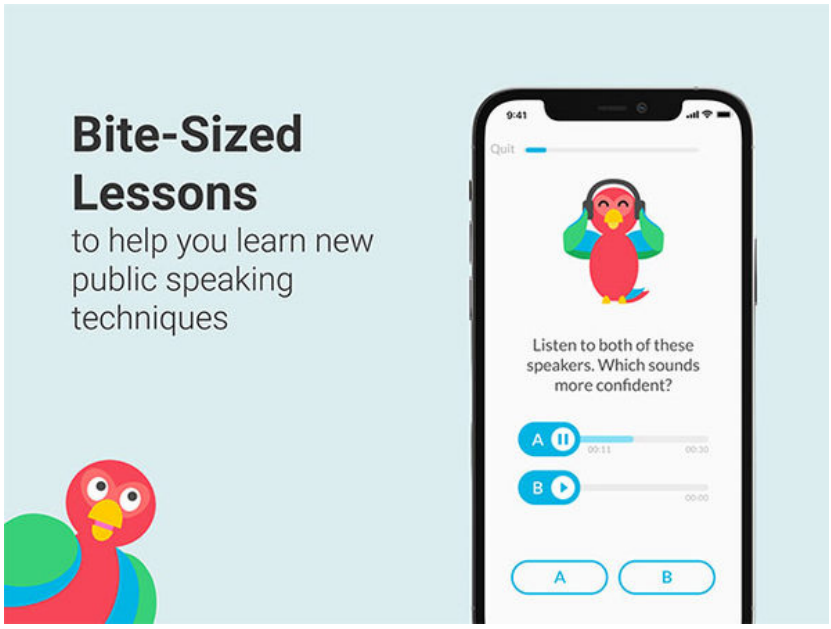


Fig: Similar Application (Orai)

Orai is an app that uses AI to let you practice presentations and get immediate feedback on how to improve. It helps with public speaking, improving your speech, Toastmasters, and learning how to talk to people. Orai is used by businesses to run communication and soft skills training in a way that is both affordable and scalable. It is a platform for learning and socializing that offers the most popular way to learn oral communication in multiple languages.

3.2.4 LikeSo

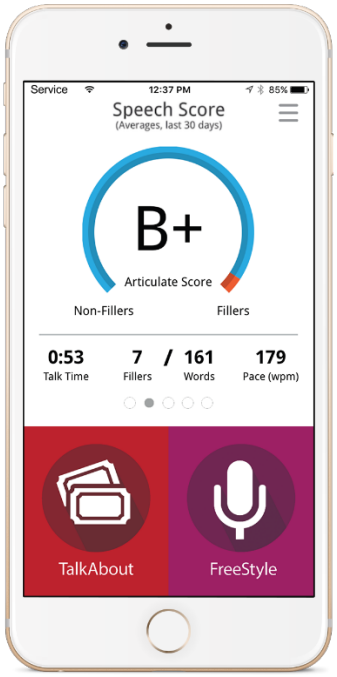


Fig 3.2.4: Similar Application (LikeSo)

LikeSo helps the user improve their own speech. LikeSo is a fun way to break bad habits and get better at speaking clearly and with confidence. It has two ways to play: freestyle, which is like a "open mic," and TalkAbout, which is a conversation game to help you get better at talking. LikeSo analyzes a person's speech in real time, including the best pace for fast or slow talkers. This app looks like a game, but the chatty fun is hiding a serious goal: to help people improve their formal speaking skills (LikeSo App Review, 2022).

It gives people a fun and friendly way to work on parts of their speaking skills that are hard. For instance, like a lot of other people, tends to use "filler words." By playing a few games on LikeSo and taking some time to think and notice, the user was able to figure out where they were most likely to use those words and has made a lot of progress in getting rid of them from their speech. The only bad thing about LikeSo is that after monitoring sessions, the app doesn't give any suggestions for how to improve. Instead, users can go to a companion website for more information.

3.3 Used Platform

Programming software is a tool or application used in software development to create, debug, maintain, or support other programs and applications. This app was made with the help of several different kinds of software. From how the user interacts with the app to how it works, the design and development of this app took several months. Adobe Photoshop, Android Studio, QSEE SuperLite, Google Chrome, Github (for saving code), Notepad++ (for taking notes), and Firebase were used to design and build this app (for data storing). Here are the platforms that were used and what they were used for:

1. Android Studio

The official integrated development environment (IDE) for Android is called Android Studio. It was made by Google and is based on IntelliJ IDEA. This platform is used to code the "Checking grammar via speech" app because it has many tools, such as a source code editor with features like code refactoring, syntax highlighting, and auto-completion. It is made to be customizable, so that the layout of the windows can be changed to fit the way a developer works. The Editor Tool Window gives the user instant access to shortcuts and actions that let the programmer quickly import resources, improve code quality, manage device state, debug applications, and more. Android Studio uses Instant Push to send code and resource changes to an app that is already running. A code editor helps programmers write code by completing, reflecting, and analyzing the code. (A 2018 Contributor)

2. Firebase

Firebase is a mobile platform that Google made to help app developers make better experiences for their users. Its main goal is to help developers make better apps, grow their user bases, and get more people to use them by giving them products and solutions. It offers cloud storage and is a must-have tool for developers to use its features, such as authentication, app analytics and crash reporting, cloud messaging, dynamic links, hosting, measuring retention, and more. Since it is a cloud-based solution that doesn't take up much space and helps manage authentication and cloud hosting for mobile apps. It was also used to store information about users and sync information between devices in real time.

3. Google Chrome

Google Chrome is a web browser that works on more than one platform. It's made for quick searching, safe browsing, and other online tasks. It is a very fast and safe web browser that was made with web standards in mind. It came out in 2008 and has been getting more and more popular ever since. Chrome is a great browser for all of your favorite websites. It was made with free software from Apple WebKit and Mozilla Firefox. In the same way, Chrome was used as a case study, research, and development of case studies in the appendix or supplement for making an app. It is the browser that Linux, macOS, iOS, and Android use by default. Chrome OS's most important part for running online apps is the browser (Wikipedia, 2022).

4. Notepad

Notepad is a simple text editor that comes with every version of Windows. It lets you make plaintext files, open them, and read them. It's a great place to quickly write small scripts or take notes in ASCII format. It uses the font and color scheme that come with Windows, but users can change these things if they want to. Notepad won't open a file that is formatted in a certain way or isn't just plain text. (Hope, 2021). It is also the favorite app of many users because it is easy to use and gets the job done.

5. Adobe Photoshop CC

Adobe Photoshop CC is a professional piece of software that can edit, process, compile, and change digital images in all kinds of ways. It has more tools and options than a designer could ever need, from simple digital photo editing to advanced 3D rendering. It was used to make the company logo and the user interface for an app. I also used Photoshop to make a wireframe, which I used as vector art for the background. Its graphic design program lets designers make, edit, and change different kinds of digital art and visuals. It was made by Thomas Knoll and John Knoll in 1988. It is the official license for distributing the program. Photoshop comes in many different forms (Walker, 2022).

6. Github

GitHub is a system for keeping track of changes to files and coordinating the work of multiple people on those files. Developers often use it to store their source code, which can be shared or kept secret. Its repository was used to save past errors on the server so they could be used again, which is an important feature for testing an app while it is being built. Most of the time, version control makes it easy to see the differences between different versions of a person's work. You and other people can work on programming at the same time without having to merge changes or check out files. Users can save their work on GithHub to their PCs so they can make presentations and share them on social media.

7. QSEE SuperLite

QSEE SuperLite is a general modeling environment that works with many different modeling tools. Dr. Mark Dixon came up with it. It is the result of a lot of work over many years (QSEE, 2022). It can be used to make models that are big and complicated or small and easy, using any combination of blocks, basic components, and libraries. When switching from one task to another, you don't need to learn a new language or set of tools. It is made to be fast and work well, and it fits the needs of engineers today perfectly. This started out with QSEE Super Lite, which is an environment that makes it very easy to make class diagrams and UML diagrams.

METHODOLOGY

4.1 Considered Methodology

A software development methodology is a way to divide the work of making software into separate phases (or stages) that each have tasks to help with planning and management. A plan for making, developing, and maintaining software. Features include that all the information is in one place, that it is organized hierarchically, that it covers everything about the software development process, and that it is easy to learn, use, and understand. There are many different ways to develop software.. These include:

i) Waterfall Methodology and

ii) Agile methodology

Other types of methodologies include prototyping, spiral development, etc.

1. Waterfall Methodology

The waterfall model is an example of a sequential way to plan. In the phases of design, construction, and testing, system requirements are figured out and put into place. The Waterfall model is the one that other development models are based on (Dora & Dubey, 2013). This method was made so that a development team could understand and meet a project's goals early on, without taking too many risks or wasting too much time. It does this by building up the solution step by step through clearly defined stages: starting, analyzing, designing, coding, testing, and deploying.

Generally an organization software development life cycle is a based upon the waterfall model (Dawson, et al., 2010). A common example of waterfall, which specifies that work be divided into separate phases representing distinct activities. The different phases involved in waterfall methodologies are:

- Requirement
- Analysis
- Design
- Implementation
- Testing
- Deployment
- Maintenance

2. Agile Methodology

The Agile methodology is a way of making software that focuses on short, fast iterations and thorough documentation. It is more flexible, which makes it easier for developers to make the best product possible in the least amount of time. The idea aims to improve time-to-market and time-to-innovation by changing how products are designed, made, and delivered.

The agile development model is also an incremental model, and its goal is to give the customer software that works. Agile software development is a set of methods that encourage planning, development, change, and delivery that are flexible and adaptable. Agile methods are a subset of both iterative methods and methods that change over time. Iterations are short so that the project team can get feedback more quickly (Dora & Dubey, 2013). When compared to the waterfall method, in which the requirements and solution are set at the beginning of a project, its development encourages planning that can change as the project goes on.More importantly in Agile provides opportunities to assess the direction of developer's project throughout the development lifecycle. The different phase cycle involved in agile methodologies are:

- Plan
- Design
- Develop
- Test

- Release
- Feedback

2. Approach Methodology

This project used Waterfall Methodology after study. Project duties are grouped into phases. A proper waterfall technique has successive stages with exit criteria approved by project stakeholders. System integration takes this technique for designing "Checking grammar via speech " apps for end users because money, resources, deliverables,

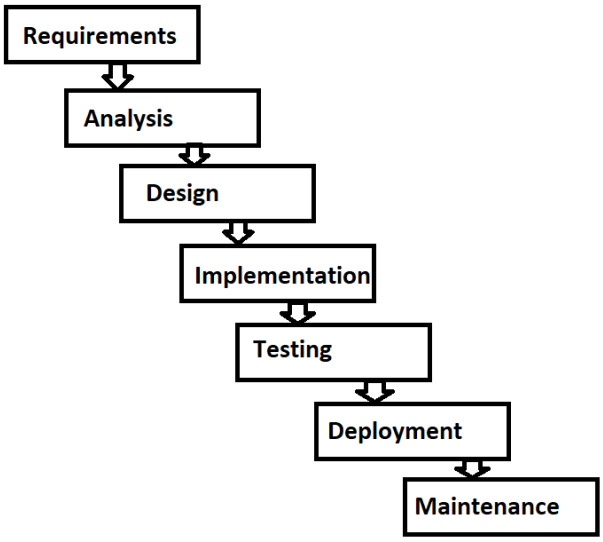


Fig: 4.2.1 Waterfall Methodology

The above figure 4.2.1 depicts about the different phases of Waterfall methodology. Similarly, the different steps were approached in order to carry out this project in an efficient mannered way.

I. Early in the project, requirements are completed, allowing scope, a precise timetable, and application design.

II. It improves resource utilization by allowing actions to be conducted in parallel or aggregated to maximize talents.

III. All requirements and deliverables must be understood to improve application design.

IV. A thorough timetable and measured plan allows for easier measurement of the project status.

V. Then testing and deployment was done separately, which creates no impact in the final tests.

However the necessary approach was taken but it has also the side effects. As it's unsuitable for complex project apparently the project requirement changes frequently. This leads to rise of bugs in an application during the phase.

SOFTWARE REQUIREMENT ANALYSIS

5.1 Introduction

SRA helps developers combine client and technological demands. Software Requirements Analysis is crucial to any software project. Before design, after elicitation. Before developing software, ensure sure the requirements are clear, consistent, and complete. The Software Requirement Analysis defines the software's purpose

5.2 Scope

SRA helps developers combine client and technological demands. Software Requirements Analysis is crucial to any software project. Before design, after elicitation. Before developing software, ensure sure the requirements are clear, consistent, and complete. The Software Requirement Analysis defines the software's purpose and usage.

5.3 Proposed System

The "Checking grammar with speech" program uses Java code that is spoken (called "Java syntax"). First, this app enables users sign up for and log

onto a Firebase server connected to other servers. The system can be utilized on smartphones and any internet-connected device.

The suggested system incorporates real-time text-to-speech conversion, which enables users read their own phrases and provides them full control over the process, making it easier to develop or learn. The technique uses phonemes with varied pitches to better match sounds to letters. The user needn't say every part aloud. This app's speech-to-text feature repairs grammar and fills in gaps automatically. Proposed system checks grammar, spelling, and punctuation. After checking their grammar, they'll see what they did wron

5.4 System Requirement Specification

Hardware Requirements

- A minimum Android version of 2.2 - 2.4 is required
- Processor speed should be no less than 500 MHz
- RAM should be at least 200 MB
- SD card with at least 516 MB
- USB debugging should be enabled on the device

Software Requirements

- Android Mobile Operating System (2.2 or later)
- Development Tools: Eclipse or Android Studio
- Internet Require: Yes
- Read and Write Storage Require: Yes
- Mic Require: Yes
- Code used: Java, XML

PRODUCT DESIGN

Task Mode	Task Name	Duration
	Initial Project Plan	**44 days**
	Topic Decide	3 days
	Specification	5 days
	Submission	1 day
	Planning	**43 days?**
	Develop Scope Statemer	**5 days**
	Designing	12 days
	Executing	**21 days?**
	Creating	13 days
	Editing	15 days
	Finishing	3 days
	Data Collection	14 days
	Monitoring and Controllin	**29 days**
	Issue tracking	8 days
	Progress report	18 days
	Testing	1 day
	Closing	**8 days**
	Presentation	6 days
	Submission	0 days
	Report Submission	1 day

1.Grant Chart

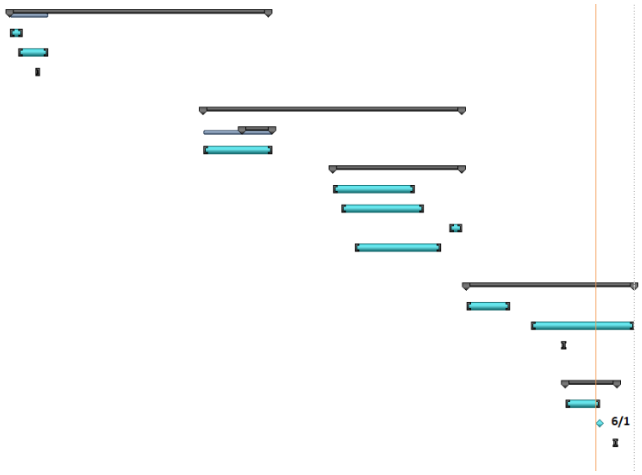


Fig: 6.1.1 Gantt chart

The Gantt chart is an informative chart for every solution. It highlights the informative data collection on accumulated date by using start to end timestamps. The fig 6.1.1 illustrates the tasks involved and researched in different timeframe.

2. ER Diagram

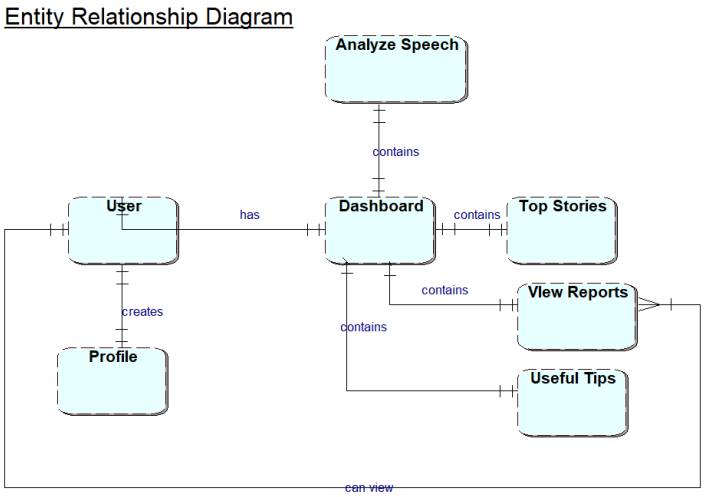


Fig: 6.2.1 ER Diagram

This application is used to make an ERD. The fig. 6.2.1 shows how the user entity works from the user's point of view. The only way for a user to get to their profile is to log in to their dashboard. Also, the dashboard entity is the most important part of this system because it tells the user what to do. A dashboard has analyze speech, which users can use to check their grammar. Top stories is a place to look at world news. Useful tips that can help people learn more about how to speak in public. Users can also look at their profile and the reports made when their grammar is checked.

3. Use Case Diagram

UML use case diagrams show how users interact with a system. A use case diagram shows how actors interact with the system, their goals, and how it works. It emphasizes user actions and system interactions.

A proposed Unified Modeling Language (UML) is made for the mobile application named “Checking grammar via speech”. It consists of all the key features that was to be included in the application. The application consists of two major actors. They are:

i) User and

ii) Admin

The User and the Admin role has been discussed in Fig: 6.3.1. As the mentioned diagram keep the track while working on the development.

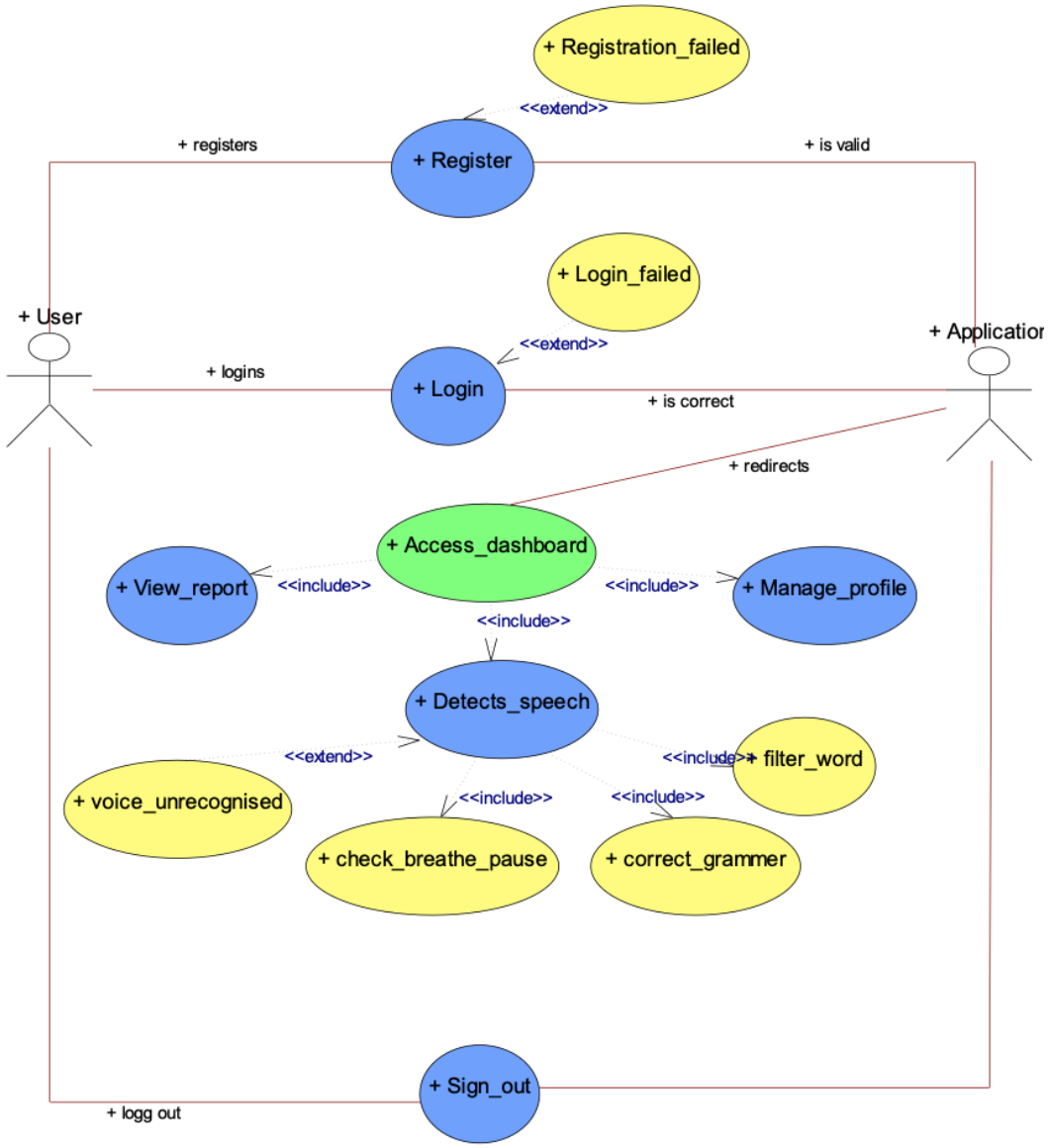


Fig 6.3.1: User Use Case Diagram

The above diagram Fig 6.3.1 discuses about the User role. Firstly when the User clicks into Register button the system redirects the user to register form. The User have to fill their basic information which will be essential to be used during registration. The system checks and validates the User inputted data. After successfully registration the new user record is inserted into database. The system then redirects the user to login page.

The login systems allow the user or the administrator to access an application. The User have to fill up their credentials which was used during registration. The system checks the entered credentials and redirects the User to its particular dashboard respectively.

After accessing to dashboard, User can now use the application features. Talking about its working, when the user clicks on recording button it analyses user voice and transform it into text. It checks the grammatical errors, checks breathes and pauses, fills and add up the words, checks the accuracy of the user. After all of these tasks have been completed, a report is created. The user can also manage their profiles, view profile, view reports. If they desire to sign out of the system, the system will log them out as well.

4. Class Diagram

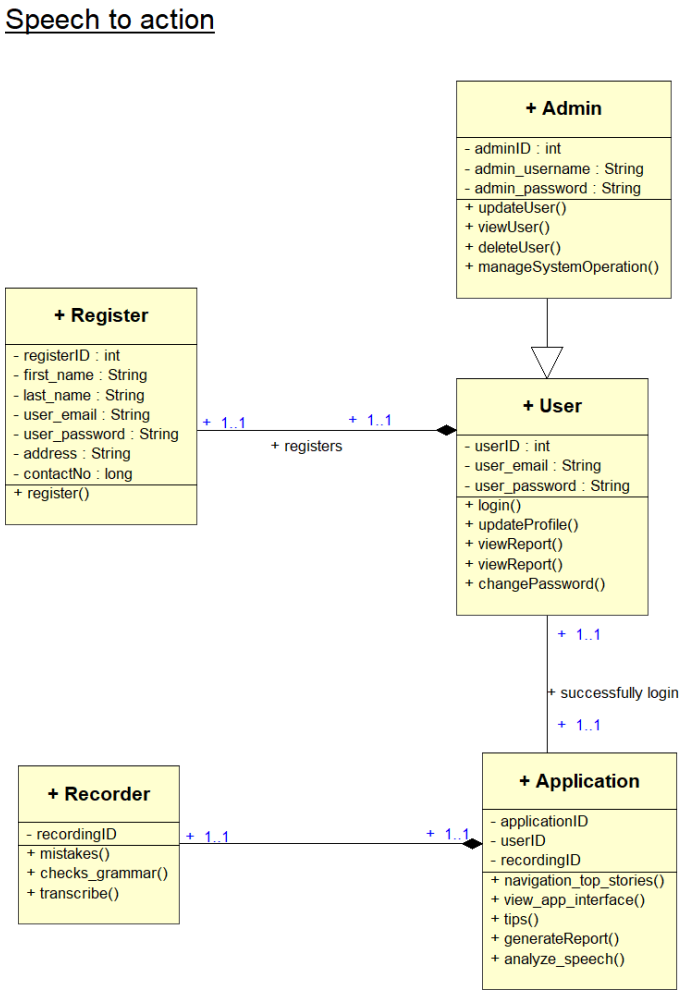


Fig 6.4.1: Class Diagram

The class diagram is the most important part of the structure in object-oriented modeling. It is used for both broad conceptual modeling of the structure of the application and detailed modeling, which is the process of turning models into programming code. When it comes to making apps, the makes it easier and faster for the developer to work.

In the process of constructing an application, several classes may be developed. Fig 6.4.1 provides an interpretation of these classes. The primary structural component clarifies each class's operations as well as the characteristics that define it.

6.5 Wireframe

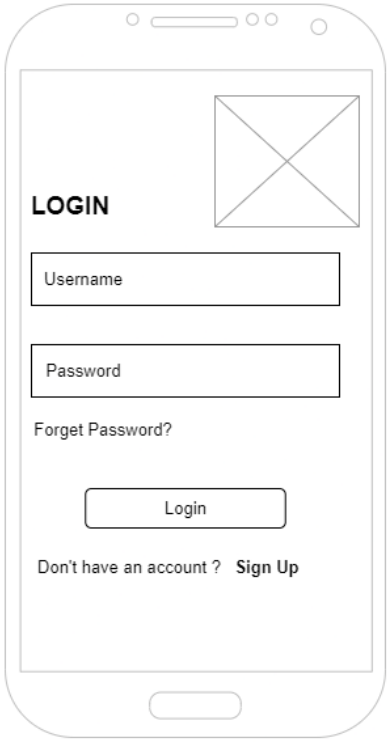


Fig 6.5.1: Login wireframe

The figure 6.5.1 is the wireframe for login page. It consists of two text field area placed for user email and password. There are also two buttons (i.e. Login and Sign Up). Log in is for logging the user and while the other is for user registration.

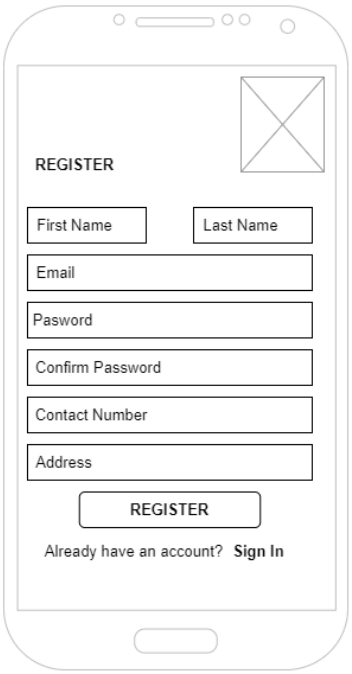


Fig 6.5.2: Register wireframe

The figure 6.5.2 is the wireframe for register page. It consists of all the details required for user for registration. It includes first name, last name, email, and password, confirm password, contact number and address. There are also two buttons (i.e. Register and Sign In).Register is for registering the new user and while the other is for redirecting the user for login.

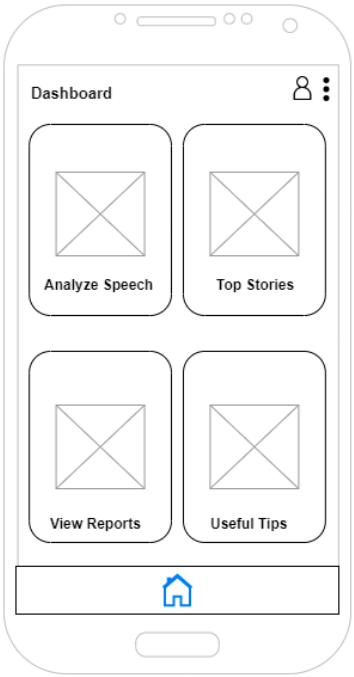


Fig 6.5.3: Dashboard wireframe

The figure 6.5.3 is the wireframe for dashboard page. It consists of four major buttons for redirecting the user for different purpose. At the top of the title the profile icon redirects user to view their profile. Pressing on breadcrumbs enables the dropdown link for Log out, which log out the user from the application.

Analyze speech for redirecting the user for testing, and checking grammar. Top stories is for redirecting the user for viewing top global news. View reports is for redirecting the user for viewing their progression. Useful tips is for redirecting the user for providing the user with public speaking tricks.

Lastly, the home icon is placed for redirecting the user to their main dashboard.

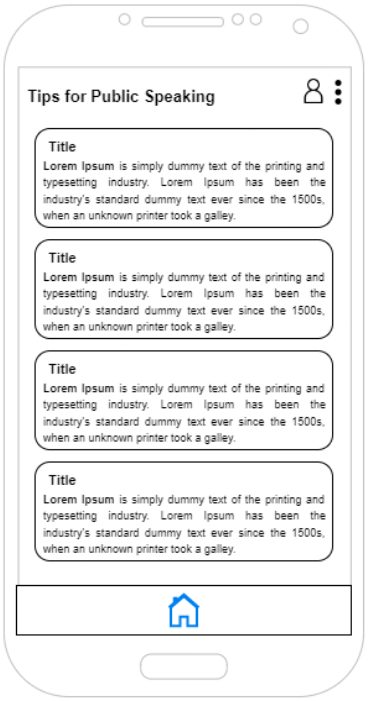


Fig 6.5.4: Tips for public speaking wireframe

The figure 6.5.4 is the wireframe for useful tips. It displays tips for user in order to enhance public speaking skills.

Fig 6.5.5: Profile wireframe

The figure 6.5.5 is the wireframe for profile page. It shows the details of the user. User can also change their password accordingly.

Fig 6.5.6: Analyze speech wireframe

The figure 6.5.6 is the wireframe for analyze speech page. It consists of text field and two buttons. The mic button is for getting the input from user voice and the check button is for checking the user's grammatical errors.

Fig 6.5.7: Top stories Wireframe

The figure 6.5.7 is the wireframe for top stories page. It displays the global news for the user.

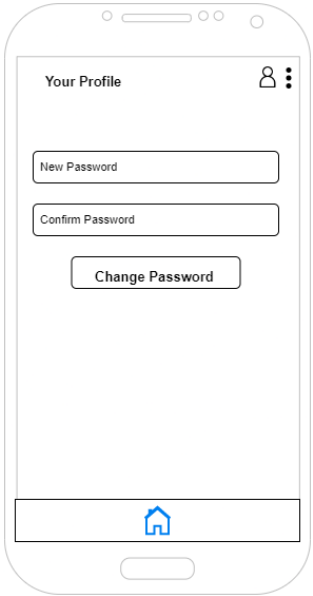


Fig 6.5.8: Change password wireframe

The figure 6.5.8 is the wireframe for change password page. It consists of two text field where user can change their password accordingly. The change password button checks and changes the user's password.

6. Prototype Design

Based on the wireframe, a prototype was made. Solid Works was used to design the prototype, keeping in mind the ideas and vision. Then, real people use the built prototype to test its functions, quality, and ease of use.

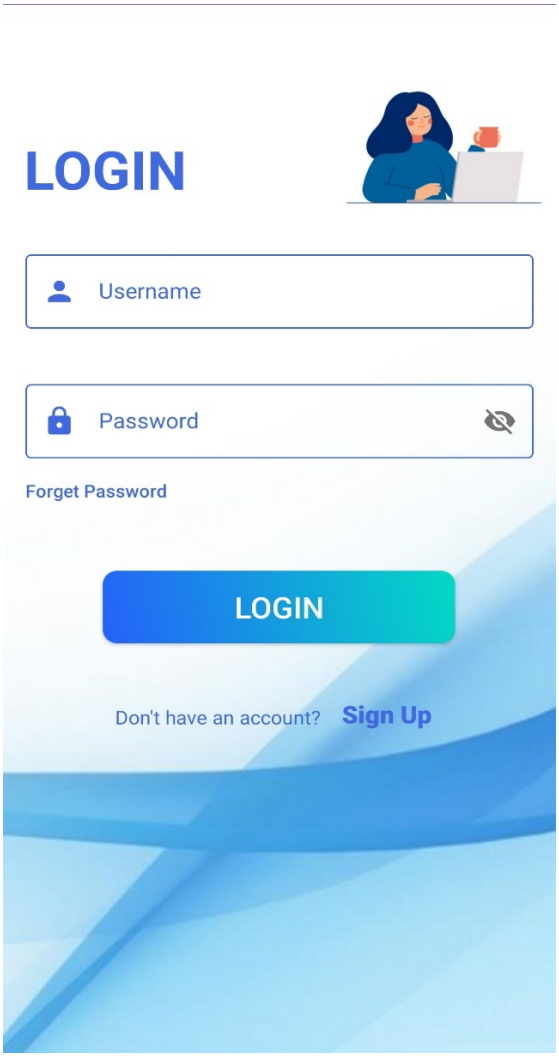


Fig 6.6.1: Login User Interface

The above fig 6.6.1 is the prototype design of Login User Interface. The login page allows a user to log in to the dashboard.

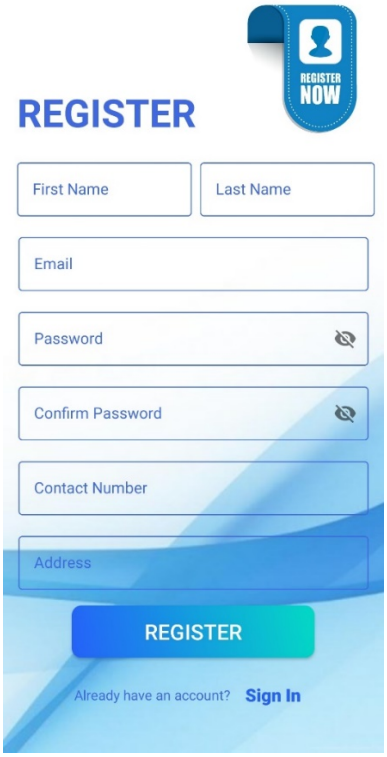


Fig 6.6.2: Register User Interface

The above fig 6.6.2 is the prototype design of Register User Interface. The register page registers the user for accessing the application.

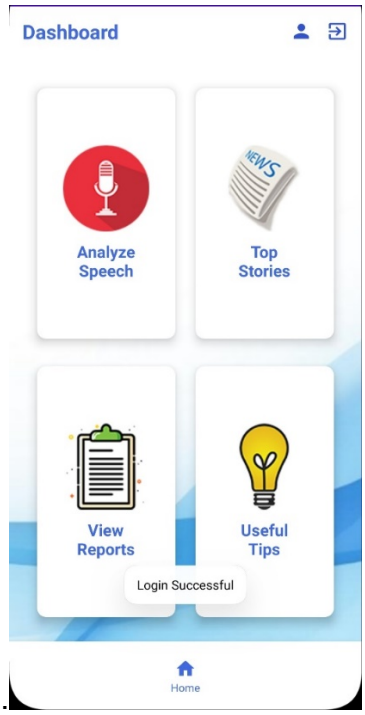


Fig 6.6.3: Dashboard User Interface

The above fig 6.6.3 is the prototype design of Dashboard User Interface. It allows the logged in user to access application features to the user. User can perform various tasks and redirects to the user accordingly via dashboard.

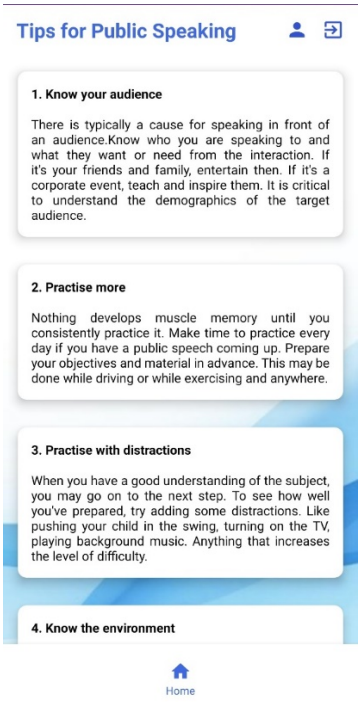


Fig 6.6.4: Tips for Public Speaking User Interface

The above fig 6.6.4 is the prototype design of Tips for Public Speaking User Interface. It displays the useful tips for the user who wants to improve their presentation skills.

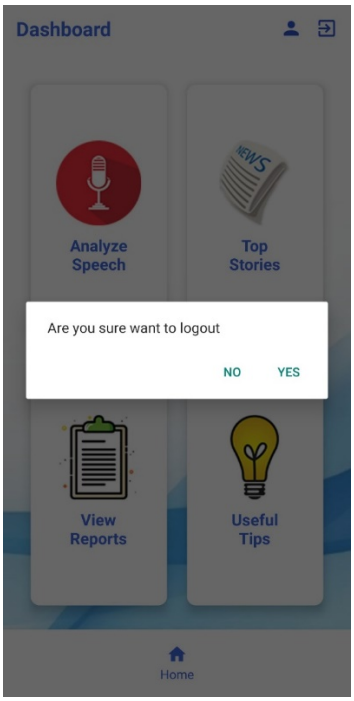


Fig 6.6.5: Logout Confirmation User Interface

The above fig 6.6.5 is the prototype design of Logout Confirmation User Interface. It displays the pop message for confirming the user to log out of an application.

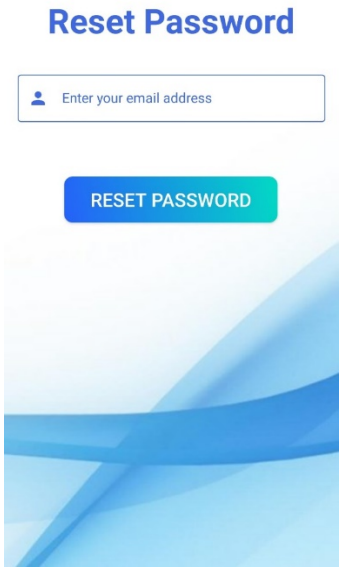


Fig 6.6.6: Reset Password User Interface

The above fig 6.6.6 is the prototype design of Reset Password User Interface. The user can reset their password by using their email address.

IMPLEMENTATION AND TESTING

7.1 Background

In general, implementation testing is the process of making sure that technology requirements are met. This procedure checks to see if the specification can be put into action and if the actions taken match the specification. This method helps improve the quality and compatibility of implementations (WCAG WG, 2022).

7.2 Test Plan

Software bugs can have many different effects if they are caused by bad design, coding, configuration, use, or any operation that involves a user. In the Software Development Life Cycle, testing is an important step (SDLC). Also, you should start with unit testing and move on to system testing to find bugs and mistakes that happen during implementation. Without thorough and right testing, software development leads to low system testing, high maintenance costs, unreliable and wrong results,

7.3 Implementation and Testing Approach

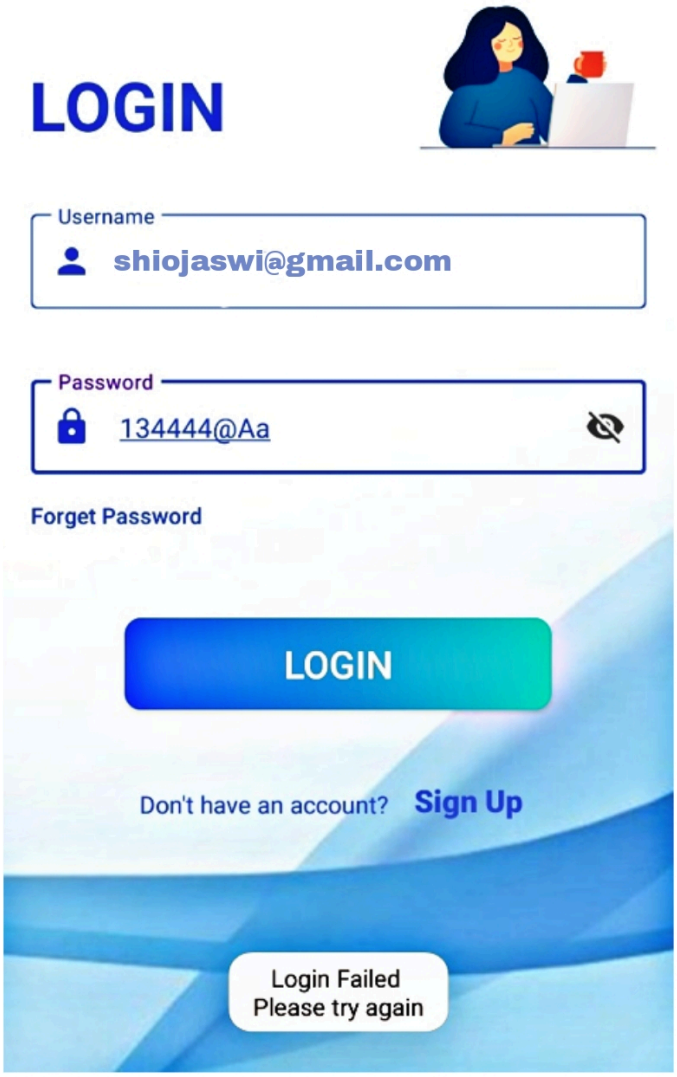
The testing method starts with the design of the system. It is put into place and started during the SDLC. All of the planned and presented system design components are made in the right way to get the desired result. The specifications for the product are then used. The user-friendly UI is made with Android Studio and XML code that is based on the database. All of the project's requirements are taken into account and used to make a "Speech to Action" app. So, referring to the Wireframes made at the beginning of an app's development is the way it is built.

Before coding, tables are made in the database that were built with the help of an ERD (Entity Relationship Diagram) study. This makes sure that all of the important database features of the ERD table are included when coding. But for this project, it needs a database that works in real time and is built on Firebase. An ERD is not needed. On the back end of the project, Java programming with JSON was used, and on the front end, user interface layout was done with XML files.

Last but not least, during the making of this app, many other ways to do things were thought of. First, a requirements analysis was started to figure out what application will be built and how it will work. Also, the design of the data was done before any tools were made. UML diagrams were also used to model the data, which helped figure out how the data will be spread out across the system and what kinds of entities will be added to make it more useful.

7.4 Test Cases

The testing is done to check the performance of an application and how it functions. The test results of the “Improve Speech” application is illustrated below:



1.Test 1

Fig 7.4.1: (Test 1) Empty field required message

Objective	To test fields with empty data in login page
Expected Result	Error message should be displayed
Actual Result	Error message displaying Username and Password field is required
Conclusion	Pass

2. Test 2

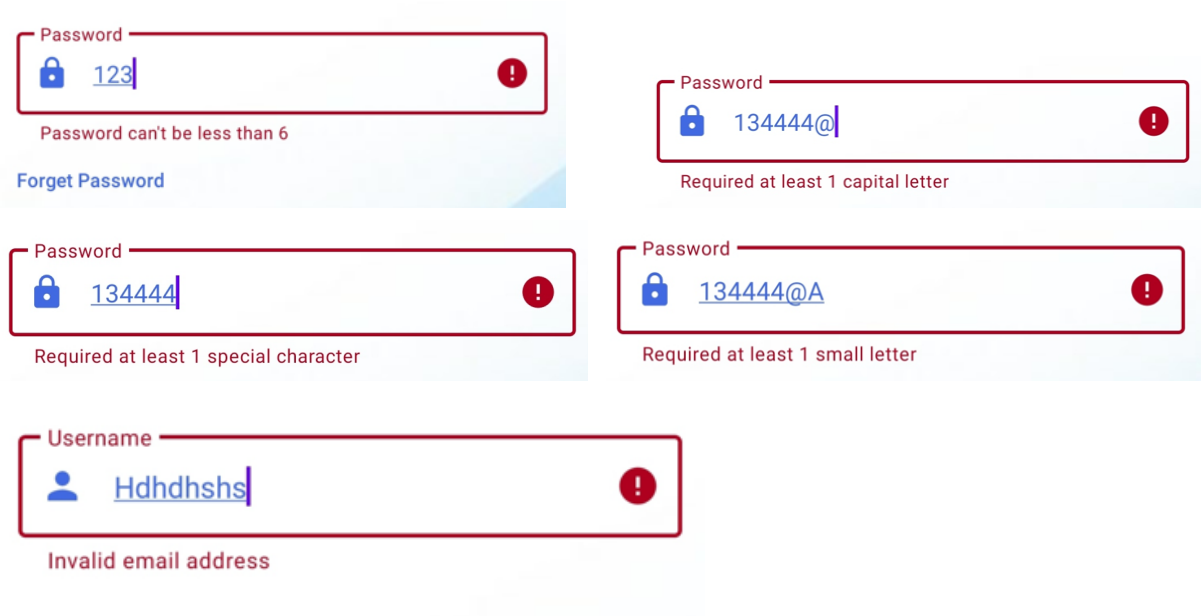


Fig 7.4.2: (Test 2) Password validation error message

Objective	To test fields of password validation in login page
Expected Result	Error message should be displayed
Actual Result	Error message displaying : • Password must contain 1 capital letter • Password must contain 1 small letter • Password must contain 1 numeric value • Password must contain 1 special character • Password shouldn’t be less than 6 characters
Conclusion	Pass

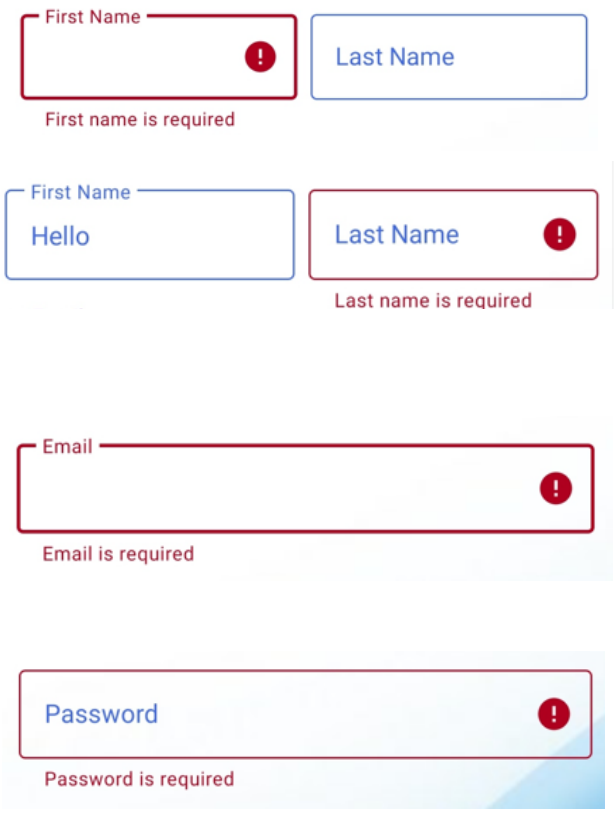


Fig 7.4.3: (Test 3) Invalid email error message

3. Test 3

Objective	To test fields of email validation
Expected Result	Error message should be displayed
Actual Result	Error message displaying: • Invalid email address
Conclusion	Pass

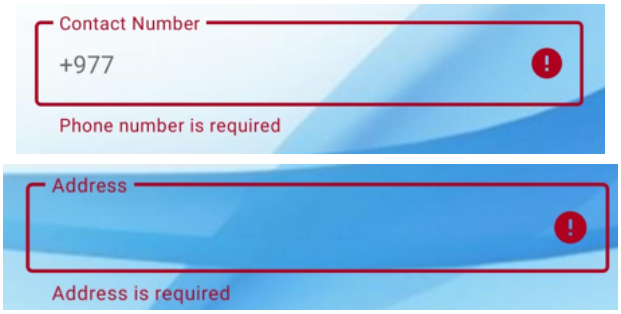


Fig 7.4.4: (Test 4) Field required error message

4. Test 4

Objective	To test fields with empty data in Register page
Expected Result	Error message should be displayed
Actual Result	Error message displaying: • First Name is required • Last Name is required • Username is required • Password is required • Confirm password is required • Contact number is required • Address is required
Conclusion	Pass

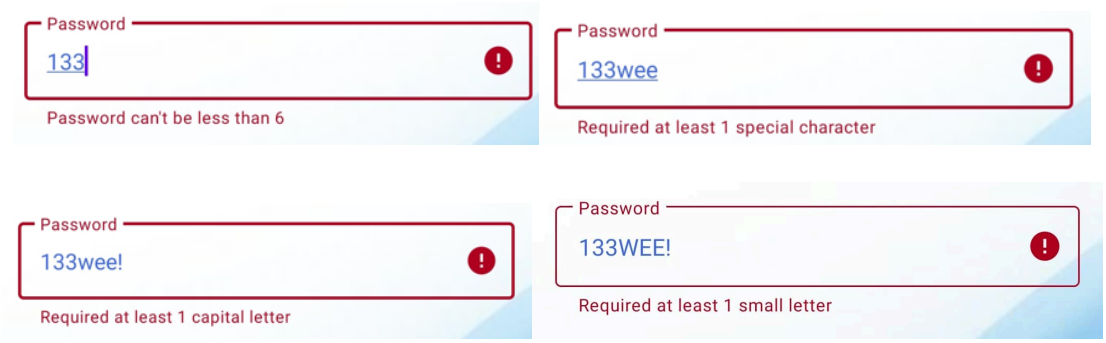


Fig 7.4.5: (Test 5) Register password validation error message

5. Test 5

Objective	To test fields of password validation in register page
Expected Result	Error message should be displayed
Actual Result	Error message displaying : • Password must contain 1 capital letter • Password must contain 1 small letter • Password must contain 1 numeric value • Password must contain 1 special character • Password shouldn't be less than 6 characters
Conclusion	Pass

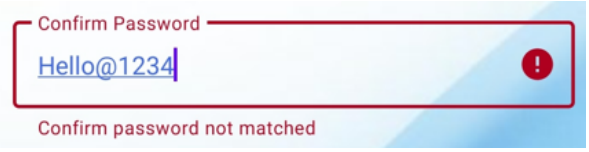


Fig 7.4.6: (Test 6) Confirm password not matched error message

6. Test

Objective	To test confirm password and password when written incorrectly
Expected Result	Error message should be displayed
Actual Result	Error message displaying: • Confirm Password not matched
Conclusion	Pass

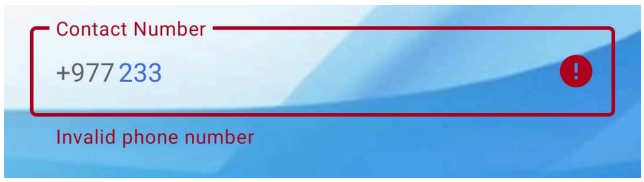


Fig 7.4.7: (Test 7) Invalid phone number error message

7. Test 7

Objective	To test fields of contact number validation
Expected Result	Error message should be displayed
Actual Result	Error message displaying: • Invalid phone number
Conclusion	Pass

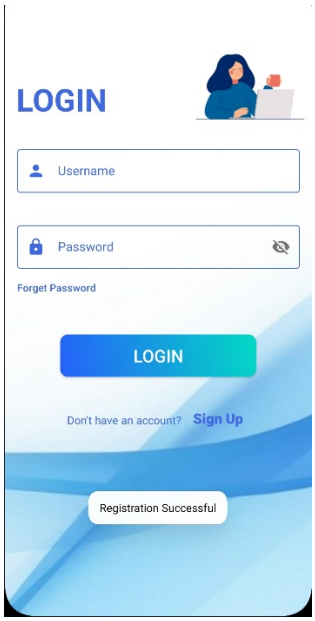


Fig 7.4.8: (Test 8) Registration Successful message

8. Test

Objective	To test user registered
Expected Result	Success message should be displayed and redirects user to Login page
Actual Result	Success message displaying: • Registration Successful
Conclusion	Pass

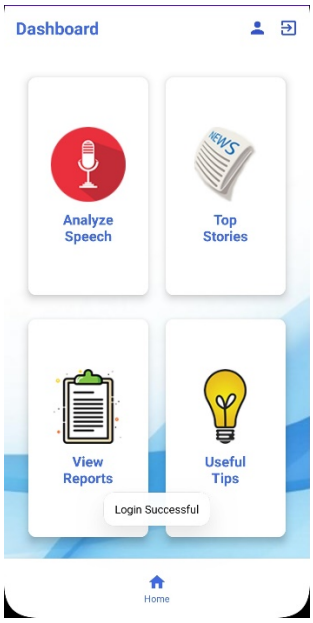


Fig 7.4.9: (Test 9) Login Successful message

9.*Test 9*

Objective	To test user login credentials
Expected Result	Success message should be displayed and redirects user to Dashboard page
Actual Result	Success message displaying: • Login Successful
Conclusion	Pass

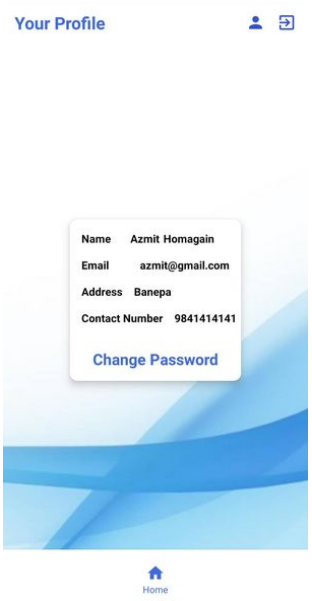


Fig 7.4.10: (Test 10) View user info

10. Test 10

Objective	To test user can view their profile
Expected Result	User can view their details on profile page
Actual Result	Displays user profile and information
Conclusion	Pass

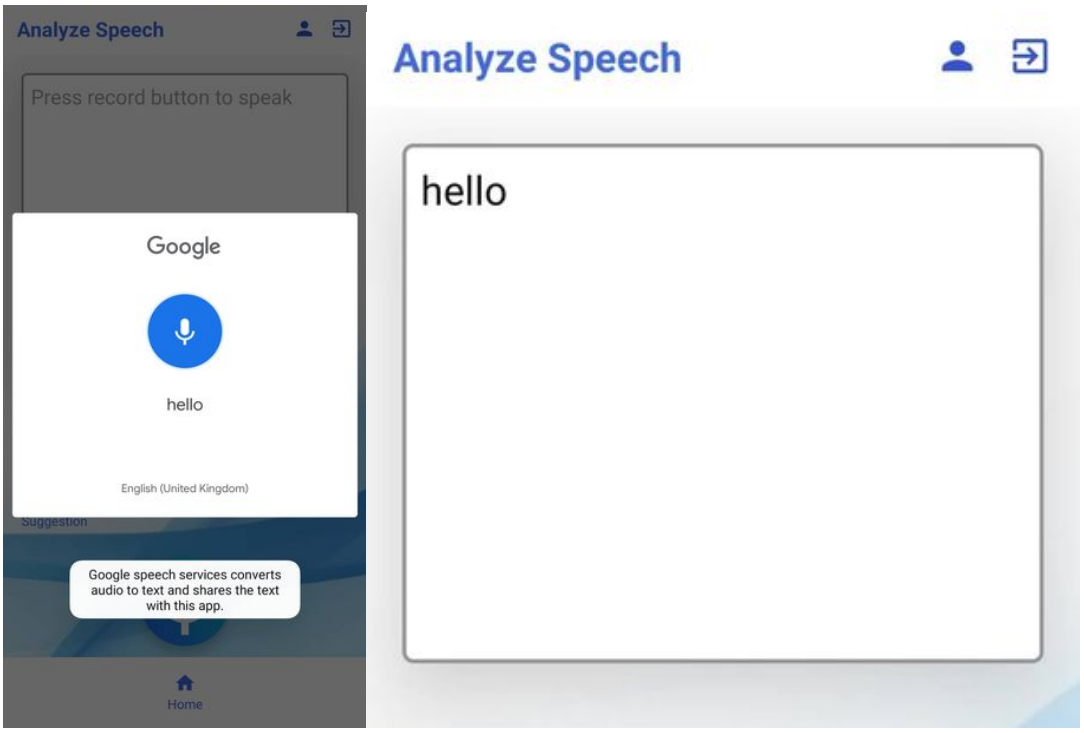


Fig 7.4.11: (Test 11) Transcribes speech to text

*11.*Test 11

Objective	To test user speech can be transcribe to text
Expected Result	User voice should be transcribed to text input
Actual Result	Successfully transcribes user speech into text form
Conclusion	Pass

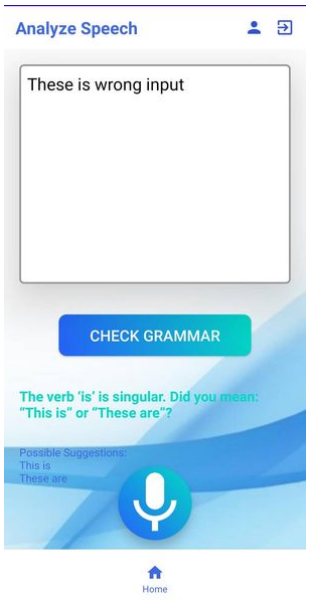


Fig 7.4.12: (Test 12) Displaying description and suggestions

12. Test 12

Objective	To test user grammar
Expected Result	Clicking on Check Grammar button provides description and suggestions to user grammar
Actual Result	Successfully provides suggestions and description message to the user
Conclusion	Pass

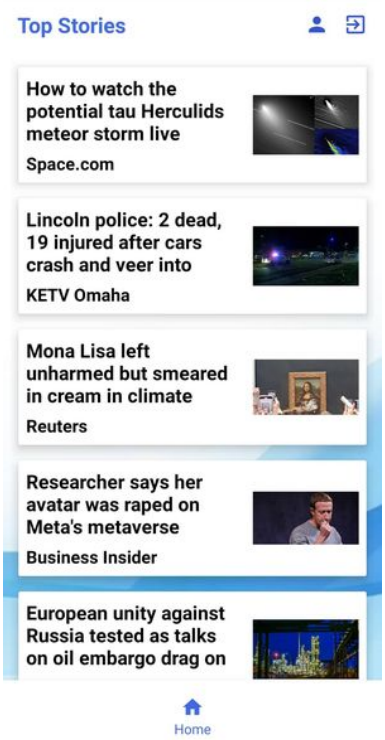


Fig: (Test 13) Displaying News reports

13. Test 13

Objective	To test user can view top stories

Expected Result	User can view top stories on Top Stories page
Actual Result	Displays top stories to user
Conclusion	Pass

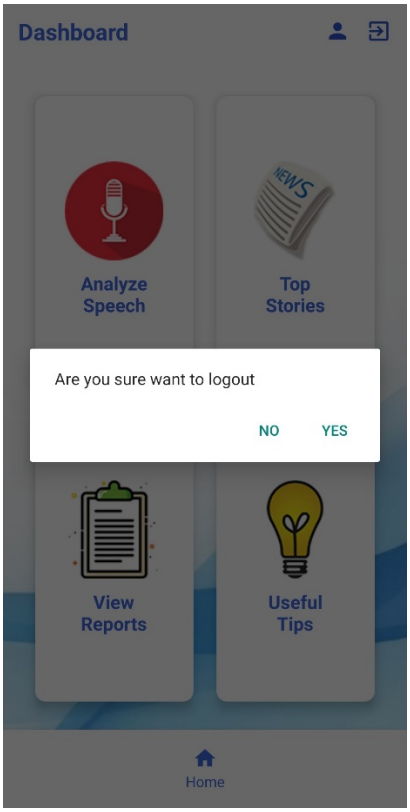


Fig: (Test 14) Logout message

14. Test 14

Objective	To test user should terminate from the system
Expected Result	Clicking on exit icon and again clicking on Yes message logs out from the system and redirects user to login page
Actual Result	Logs the user out from the system
Conclusion	Pass

EVALUATION

8.1 Product Evaluation

The final product includes all of the original project plans, such as modal verbs and the ability to recognize speech, as well as its other features, such as notifying users of unrecognized voices, checking for breath pauses, filtering words, and fixing grammatical errors. It also gives suggestions for how to make the content more effective and easier to read and understand. Not only that, but the product is made so that logging in and registering is easy and doesn't cause a lot of trouble. Once the details are checked to make sure they match the credentials in the database, users are free to use the application's features. On the other hand, if the user's login information didn't match, an error message is sent to the user explaining what went wrong. The user can also retrieve their account if they forget their password. The product also has a section called "Top Stories" and a section called "View Reports," where you can look at reports of speeches that have already been analyzed. Including helpful tips also helps users improve their speech skills. Once a user is in the "Analyze Speech" section, all they have to do is press the record button and start talking. At the end, they can look at suggestions for the speech above and check the grammar of the speech given. Also, this app uses Google Speech Recognition to make sure it is accurate and has few false positives. The program also gives each user their own profile, where they can see what information they've given and change their password. Also, the Test Cases (Title 7.4) describe and rate the feature of the product that has been built.

The product was made to be used by a small number of people and to get their feedback. The results show that users are happy with the app, as shown by the high rate of return and the fact that most users said they are very likely to recommend this app to their close friends and family. The app was finally put into use after testing, and both the database server and the front-end work as they should.

8.2 Project Evaluation

When deployment is done, the project will be done and have a little more functionality than similar apps. The initiative is chosen and aimed at people with low confidence in public speaking and a fear of grammar because it helps them. To solve these problems, the project is a key step because it gives users hands-on practice and tells them where they went wrong. The project also gives reports of previous speeches so that the user can improve in any area. Also, the project involves the Android system, which gets rid of the need to use a powerful computer and gives users a place to practice whenever and wherever they want. Every part of this project's methods is important for making a product that works well and is accurate. The only thing a user needs to use this project is an Android device and a good internet connection. Another good thing about this project is that it was built from the ground up. This means that it is very easy to use and doesn't put too much strain on the system. The project is a simple but very effective way to solve the problem of low confidence in public speaking and make everyone a grammar whiz. The goal of this project is for it to be easy and help people improve their speaking skills without any personal help. It was built from the ground up, which made sure that the app is light and works well on different Android devices. The administration has full control over the app and makes patches and updates quickly. Since the project was built from the ground up, the developer owns all of the rights to it. This could make it easier to deal with updates, permits, and copyright issues.

So, the good parts of this project make up for its flaws, making it one of the best choices for anyone who wants to get better at public speaking.

8.3 Limitation

However, there are some rules about how this product can be used. The program is for people who want to improve their ability to communicate well in public settings. It can tell if a person is speaking a language it doesn't know because their tone doesn't match their voice. So that the Analyze speech feature doesn't pick up on background noise, the user needs to practice in a quiet place. Also, the system doesn't let the user know when they've used perfect grammar.

8.6 Appendix C (Risk Register)

ID	Risk	Risk Description	Likelihood	Impact	Severity	Mitigation	Status
	Undefined project purpose	Project purpose is not well defined	5	2	Low	Proper research and counselling	Open
	Connection Loss	Loss of internet connection	5	1	Low	Using proper networking facilities	Close
	Performance risk	Improper results of the project	2	3	Medium	Full concentration by project developer	Close
	Operational risk	Operational failure on user end	1	3	Medium	Providing proper tutorial	Close
5.	Security failure	May loss of customer data	3	2	Low	Implementing proper security measures	Close
	Bug	May have a lot of bugs	5	2	Low	Testing and debugging	Open
	Insufficient User	Low number of targeted users	5	3	Medium	Proper market research	Open

Fig: Risk Register

SUMMARY AND CONCLUSION

In today's interconnected world, the capacity to communicate effectively in front of an audience is directly correlated with one's level of intelligence. It is the goal of the "Checking grammar via speech" initiative to close this communication gap by teaching people how to talk clearly and confidently while eliminating the fear of making grammatical mistakes. The flexibility of this app makes it a winner, since it can be adapted to suit the needs of the user in almost any circumstance. Once a user has installed "Checking grammar via speech" they will consider it an integral part of their lives and a necessary step on the path to confident public speaking and a strong sense of self. Because of Java's versatility and flexibility, it was chosen as the primary language for developing this software. The application logs data relevant to both development and management, which facilitates both debugging and tracing. This program is especially useful for those who are not natural English speakers because it allows them to test and refine their skills without fear of public embarrassment.

So, "Checking grammar via speech" as the name implies, works on the user's speech to enhance and hone it so that they can speak with confidence in their own fluency and accuracy of grammar. This finest speech help is designed in Java and has a user interface that is simple, intuitive, and fun to learn. The current proliferation and permeation of portable innovation means it plays an essential part in knowledge acquisition (Altynbekova and Zhussupova, 2020). The "Checking grammar via speech" program is ideal for anyone who want to increase their confidence and competence in public speaking. Anyone can easily expand their lexical knowledge and linguistic competence with the help of this software. In conclusion, the simplicity and versatility of this program mean that it is destined to attract a large number of users. The dream fluency of its users is t

REFERENCES

AltexSoft. 2022. What is API: Definition, Types, Specifications, Documentation. [online] Available at: <https://www.altexsoft.com/blog/engineering/what-is-api-definition-types-specifications-documentation/> [Accessed 25 May 2022].

Altynbekova, G. and Zhussupova, R., 2020. Mobile Application Fluentu For Public Speaking Skills Development. SHS Web of Conferences, 88, p.02008.

Android Authority. 2022. What is Android? Here's everything you need to know. [online] Available at: <https://www.androidauthority.com/what-is-android-328076/> [Accessed 1 May 2022].

Ascribe. 2022. Linguistic Analysis Explained - Ascribe. [online] Available at: <https://goascribe.com/blog/linguistic-analysis-explained/> [Accessed 25 May 2022].

Common Sense Media. 2022. LikeSo App Review. [online] Available at: <https://www.commonsensemedia.org/app-reviews/likeso> [Accessed 27 May 2022].

Contributor, T., 2018. What is Android Studio? - Definition from WhatIs.com. [Online] Available at: <https://www.techtarget.com/searchmobilecomputing/definition/Android-Studio/> [Accessed 21 06 2022].

Dawson, M., Dawson, M., Rahim, E. & Brewster, S., 2010. Integrating Sotware Assurance into the Sotware Development Life Cycle (SDLC), Volume 3, pp. 49-53.

Dora, S. K. & Dubey, P., 2013. SOFTWARE DEVELOPMENT LIFE CYCLE (SDLC) ANALYTICAL COMPARISON AND SURVEY ON TRADITIONAL AND AGILE METHODOLOGY, Volume 8.

Ebrahimi, O., Pallesen, S., Kenter, R. and Nordgreen, T., 2019. Psychological Interventions for the Fear of Public Speaking: A Meta-Analysis. Frontiers in Psychology, 10 [Accessed 08 03 2022].

Harris, S., Kemmerling, R. and North, M., 2002. Brief Virtual Reality Therapy for Public Speaking Anxiety. CyberPsychology & Behavior, 5(6), pp.543-550 [Accessed 27 05 2022].

Hope, C., 2021. What is a Notepad?. [Online] Available at: <https://www.computerhope.com/jargon/n/notepad.html/> [Accessed 21 06 2022].

Këpuska, V., 2017. Comparing Speech Recognition Systems (Microsoft API, Google API And CMU Sphinx). International Journal of Engineering Research and Applications, 07(03), pp.20-24.

Orai, 2022. Orai | AI-powered app for practicing your presentations. [online] Available at: <https://www.orai.com/> [Accessed 27 May 2022].

QSEE, 2022. QSEE Technologies | Leeds Beckett University. [Online] Available at: <https://www.leedsbeckett.ac.uk/qsee-technologies/> [Accessed 23 05 2022].

Sojka, P., Kopeček, I. and Pala, K., 2006. Text, speech and dialogue. Berlin: Springer.

Walker, A., 2022. What is Photoshop? Introduction, Meaning, Definition & History. [Online] Available at: <https://www.guru99.com/introduction-to-photoshop-cc.html/> [Accessed 14 06 2022].

Web Content Accessibility Guidelines Working Group (WCAG WG). 2022. DRAFT WCAG 2.0 Implementation Testing Framework. [online] Available at: <https://www.w3.org/WAI/GL/implementation-testing//> [Accessed 29 May 2022].

wikipedia, 2022. Google Chrome - Wikipedia. [Online] Available at: <https://en.wikipedia.org/wiki/Google_Chrome/> [Accessed 07 06 2022].

JavaTPoint, 2022. What is android - javatpoint. [online] Available at: <https://www.javatpoint.com/android-what-where-and-why> [Accessed 1 May 2022].

Yu, T. L. & Gande, S., 2015. An Open-Source Based Speech Recognition Android Application for Helping Handicapped Students Writing Programs, pp. 1-7.

Zigh, E., Elhoucine, A., Mallek, A. & Kouninef, B., 2021. In: Toward a Mobile Remote Controlled Robot for Early Childhood in Algeria. s.l.:Springer, Cham, pp. 373-382.