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Software Requirements Specification

Memory Enhancer App

Release 1.1

Version 1.1

Prepared by Team Amazing

July 2, 2021

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Revision History

Name	Date	Reason For Changes	Version
Mitchell Olshansky	05/25/21	Initial release	1.0
Nick Ballo	07/02/21	Updated requirements list per customer and included a UML diagram	1.1

1 Introduction

1.1 Purpose

This Software Requirement Specification document describes requirements for release 1.0 of the Memory Enhancer App and is intended to be used by members of the Team Amazing project team to implement and verify required functionality of the system. All the requirements specified are committed for release 1.0 and therefore a priority to produce during upcoming release.

1.2 Document Conventions

The document conventions are based on the IEEE 830 format which is utilized in the functional decomposition approach to requirements. The highest-level priorities and all functionality within release 1.0 are covered in this version of the SRS (Software Requirements Specification) document.

The user messages to be displayed by the system are specified in this SRS in double quote and in italic font (e.g. *"Sorry, I could not hear you."*).

The references are made in APA 7th edition format.

1.3 Intended Audience and Reading Suggestions

This SRS document is intended for developers, testers, and documentation writers on the project team. The document is organized to describe a purpose, scope, and to provide a high-level description of the system from a business perspective. System features planned for release 1.0 will be decomposed to functional requirements. It is recommended to read the SRS document in its entirety, before focusing on the actual features listed.

1.4 Product Scope

The product features and functionality as part of release 1.0 will be scoped to only the following requirements of the Memory Enhancer App:

1. The application shall be trained to recognize the user's voice.
2. The application shall be Section 508 compliant such that an elderly person may use it without eyeglasses.
3. The application shall recognize the user's unique voice and phrases then will automatically begin recording a memo.
4. The application should ignore everything except what the user speaks.
5. The application shall feature a turn-on button to start capturing user's speech.
6. The application shall record transcribed text.
7. The application shall replay transcribed text to user when the user requests with unique phrases.
8. The application shall bypass asking everyone permission to record.
9. The application shall pair notes with subject of conversation.
10. The application shall not save any recorded voice audio.
11. The application shall allow user to edit and update text.

12. The application shall provide the ability to search through the saved speech to text notes via text field and/or voice command.
13. The application shall have a flexible and functioning GUI (Graphical User Interface) that is user friendly.
14. The application shall provide embedded training video guides to display the apps functionalities.
15. The application shall retrieve all results related to the search command.
16. The application shall retain speech to text recognition notes for 1 week in duration.
17. The Application must encrypt the data at rest.
18. The application shall provide a notification banner as a daily event presented to the user (That the application is available and should get used)

1.5 References

IEEE. (1998, June 25). *IEEE recommended practice for software requirements specifications*. University of Alaska Anchorage. http://www.math.uaa.alaska.edu/~afkjm/cs401/IEEE830.pdf

2 Overall Description

2.1 Product Perspective

In the United States of America, there is a small, but growing population of individuals experiencing short-term memory loss. This short-term memory loss may occur due to advancing age, a symptom of larger issues such as dementia. Life expectancy has increased significantly in the last 50 years. As such, people are living longer and require a longer, greater quality of life. Team Amazing's solution to this global issue, is to create the Memory Enhancer phone application, which acts like a cross between Apple's Siri and a friendly update reminder to serve the user as a personal assistant. The voice recognition technology utilized with this phone application will aid people with disabilities that impair their short-term memory. The general approach for developing such a product will be focused around this question: "What can we do to help people?"

2.2 Product Features

The Memory Enhancer App release 1.0 will be focused specifically on the following major product features: Voice Activation, Voice Pattern Recognition, Audio Transcription, Multiple Phrase Recognition, Feedback and Answers.

The high-level description of features planned as part of this release are as follows:

Device Microphone Access Permission – A user must allow the application to access their device microphone to alleviate privacy concerns. This is done only once when the application is opened the first time. This feature provides the capability to request user permission to access and use the microphone of their device.

Voice Activation – Capability to activate application with (or without) using voice command, where the user will be prompted with greetings, as an example: "Hello John, Happy Monday! Please note required medications to take this morning. Click "Review" to see the list."...and so on....

Voice Patterns - Capability to store/archive users' tone of voice and recognize voice patterns. This may enhance usability of the application to establish request patterns, and notifications as a response...and so on....

Audio Transcription - Capability to transcribe audio recording into the word processing file. This is the intended outcome of recorded audio from the user with the intention of using it as transcribed reminders.

Multiple Phrase Recognition - Capability to recognize voice phrases, combined phrases to determine patterns. Perhaps requires a guide describing reminders, etc.

Feedback and Answers - Capability to provide Siri-like responses to user questions or phrases, therefore providing a more intuitive application experience.

Search – Capability to search for words or phrases and have the application display any related results among saved messages.

Notification Banner – Capability to remind the user that the application is available through a notification banner on the device's home/lock screen.

2.3 Context Diagram

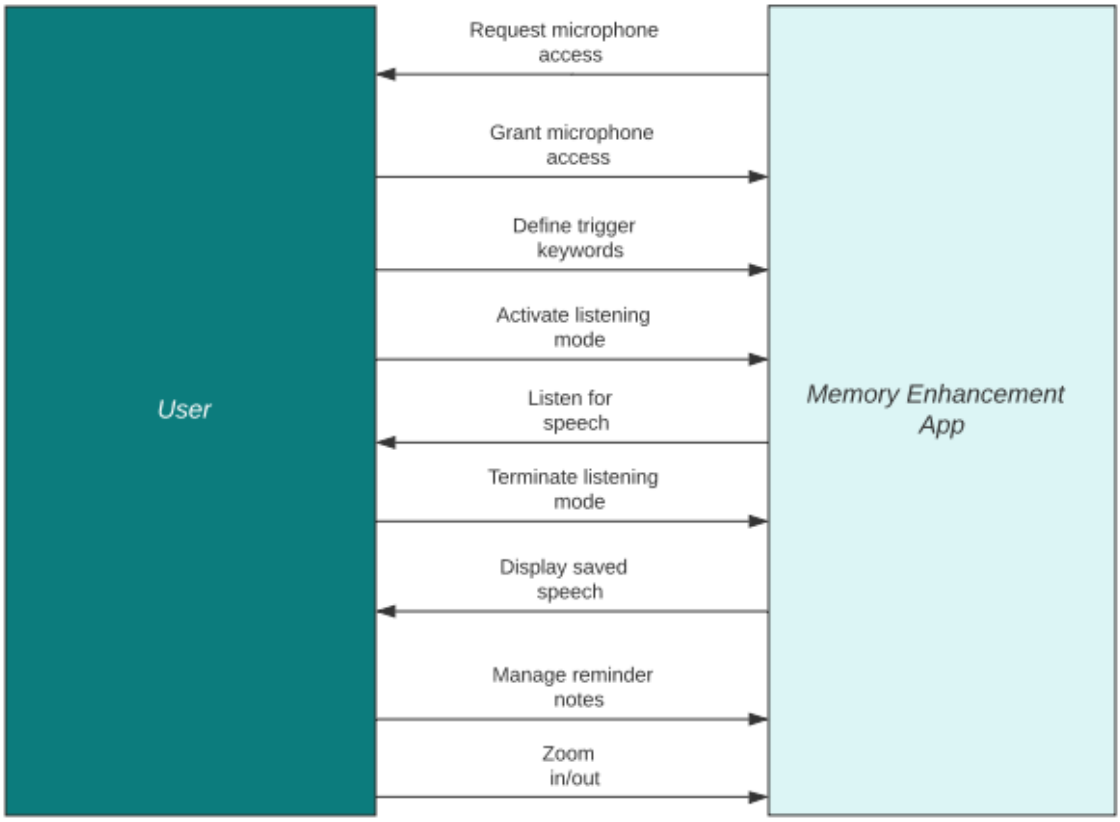

Figure 1 Context Diagram

2.4 UML Diagram

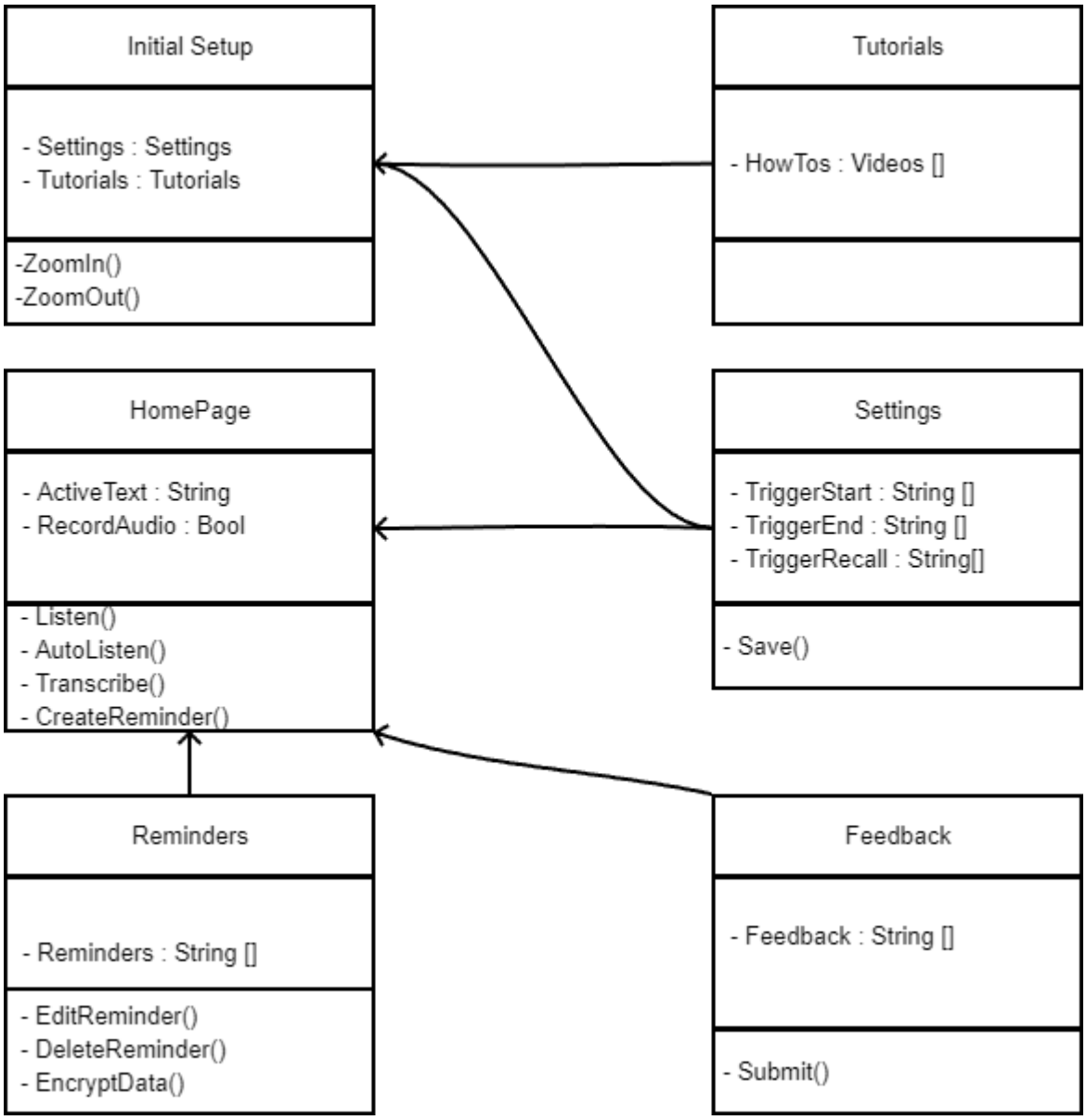

Figure 2 UML Diagram

2.5 User Classes and Characteristics

User: A user is a person who is being assisted by the Memory Enhancer application. The user installs the application on their Android-based smartphone. The user programs a set of keywords which, when spoken, directs the application to record a specific conversation or replay a conversation reminder. The user may also tap a button to trigger the application listening mode. The user can edit or delete texts converted from spoken words at any time. The system is built to support one and only one user.

2.6 Operating Environment

OE-1: The system shall be delivered as an Android application, which shall operate only on mobile devices running the Android operating system.
OE-2: The operating system of the targeted devices should include Android 7.0 Nougat, Android 8.0 Oreo, Android 9.0 Pie, Android 10, Android 11, Android 12, iOS 10, iOS 11, and iOS 12.

2.7 Design and Implementation Constraints

DIC-1: The system shall be delivered as an Android application, which shall operate only on mobile devices running the Android operating system.
DIC-2: The operating system of the targeted devices should include Android 7.0 Nougat, Android 8.0 Oreo, Android 9.0 Pie, Android 10, Android 11, and Android 12.
DIC-3: The system will also be delivered as an iOS application (i.e. for Apple devices).
DIC-4: The system shall support only the English language.
DIC-5: Open-source software can be used for the development of the system.
DIC-6: The system shall be developed in the Dart language using the Flutter framework, an open-source user interface (UI) software development framework and necessary open-source libraries such as speech recognition libraries.
DIC-7: The system shall not have any functionality implemented in the backend tier.
DIC-8: The system shall not save audio files, but rather the transcribed words of the input audios.
DIC-9: The system shall be delivered by August 2021.

2.8 User Documentation

UD-1: Upon a user accessing the system the first time, the system shall provide a quick tutorial to the user describing and illustrating the basic and most common functions of the system.
UD-2: The system shall provide a help section to the user through a help page screen where the user can seek answers to their questions on using the system.

2.9 Assumptions and Dependencies

AS-1: The Bluetooth connectivity will be managed by the device on which the system is installed.
AS-2: The user is responsible for obtaining a Bluetooth headset as well as the headset's connection to the device on which the system is installed.
AS-3: The system should also input and output sounds through a wire-connected headset, if used.
AS-4: The sounds produced by the application will be played on the selected output device from the mobile device.
AS-5: The transcribed data will only be stored for a determined period of time, approximately one week, if not discarded by the user.

AS-6: The previously saved data should still be available after the system is restarted in the event of a system crash.
DE-1: The system depends on an open-source speech recognition plugin to convert audio input to text.
DE-2: The system depends on an open-source "Text-to-Speech" plugin to convert text to audio output for playbacks.
DE-3: The proper operation of the system depends on the user giving permission to access the microphone of the mobile device.
DE-4: The proper operation of the system depends on the user giving it the permission to access the Internet from the device on which the system is installed.
DE-5: The proper operation of many of the system functions, such as the audio/text conversions, depends on the users having an internet connection.
DE-6: The quality of the audio transcription also depends on the proper functioning of the device microphone.

3 System Features

The following are the major system features that shall be included as part of Memory Enhancer application release 1.0:

3.1 Request User Permission to Use the Device Microphone

Given that the user has successfully installed the Memory Enhancer application on their smartphone device and has launched it for the first time since its installation, this functionality allows the user to give the application permission to access and use the microphone of the device. A pop-up request to approve microphone use is displayed to the user with options to accept or decline. If the user declines the permission request, the application cannot function as its access to the microphone will be blocked by the device, and this is a critical component for the proper operation of the application.

3.2 Initial Setup Trigger Keywords for Recording and Playback

Given that the user has successfully installed the Memory Enhancer application on their smartphone device and has launched it for the first time, this functionality allows the user to set up the keywords that will be used to trigger the recording of the user's spoken words and to replay previously saved conversations.

3.3 Manage Trigger Keywords for Recording and Playback

Given that the user has already setup trigger keywords, this functionality allows the user to manage (add, update, and delete) the keywords that will be used to trigger the recording of the user's spoken words and to replay previously saved conversations.

3.4 Activate Conversation Listening Mode

Given that the user has successfully installed the Memory Enhancer application and completed the initial setup (*i.e.* allow microphone use and setting up the trigger keywords), this functionality allows the user to activate the conversation listening mode by tapping a button on the home screen or speaking the assigned trigger word.

3.5 Terminate Conversation Listening Mode

Given that the user has initiated the conversation listening mode, this functionality allows the user to terminate the conversation listening mode by tapping the same button that activated the conversation listening mode or speaking the assigned trigger word.

3.6 Transcribe and Save User's Speech

Given that the user has initiated the conversation listening mode, this functionality allows the user's speech to be listened to, transcribed, analyzed, and saved as reminder notes, if necessary. No voices other than the user's voice shall be recognized by the application.

3.7 Retrieve and Playback User's Reminder Notes

Given that the user has initiated the conversation listening mode, this functionality allows the user to seek reminder assistance from the application by uttering trigger keywords. Once the appropriate trigger keywords are recognized by the system, matching reminder notes are retrieved, synthetized, displayed and played back to the user.

3.8 Manage Reminder Notes

Given that the user has had his/her spoken words successfully converted in reminder notes, this functionality allows the user to view and manage saved reminder notes.

3.9 Navigate through the System

Given that the user has successfully installed the Memory Enhancer application, this functionality allows the user to navigate through the various views of the application (*i.e.* Homepage, Reminder Notes, Trigger Keywords and Help Section) using the menu bar.

3.10 Zoom In/Out

Given that the user has successfully installed the Memory Enhancer application, this functionality allows the user to zoom in and out of any area of the application currently presented on-screen for greater clarity on text and images.

3.11 Training Videos

Given that the user has successfully installed the Memory Enhancer application, this functionality provides the user with access to official training video tutorials. The expectation is that the user easily understands functional aspects of the application once the requested training video on any particular subject is viewed.

3.12 Search

Given that the user has successfully installed the Memory Enhancer application, this functionality provides the user with a way to search through saved messages. This can be done by typing a word or phrase to search for or by using a voice queue.

4 External Interface Requirements

4.1 User Interfaces

The system user interface (UI) shall be an Android UI to be installed on Android smartphones. The UI shall have a minimalist design, and its look and feel shall be consistent across all its views. The system main functions shall be readily and intuitively accessible to the user. The user controls provided by the UI shall be developable using the available mobile development scripting and styling. The system UI shall be responsive to adjust to the various device screen sizes available on mobile devices. Figure 2 illustrates a mockup of the system UI. Figure 2 also displays the microphone button, which will activate the listening mode once it is tapped on.

Figure 2: The System User Interface

When the application is opened the first time, it will request audio access permission from the user to have access to the microphones and speakers of the device. Figure 3 illustrates the Audio Access Permission Request UI.

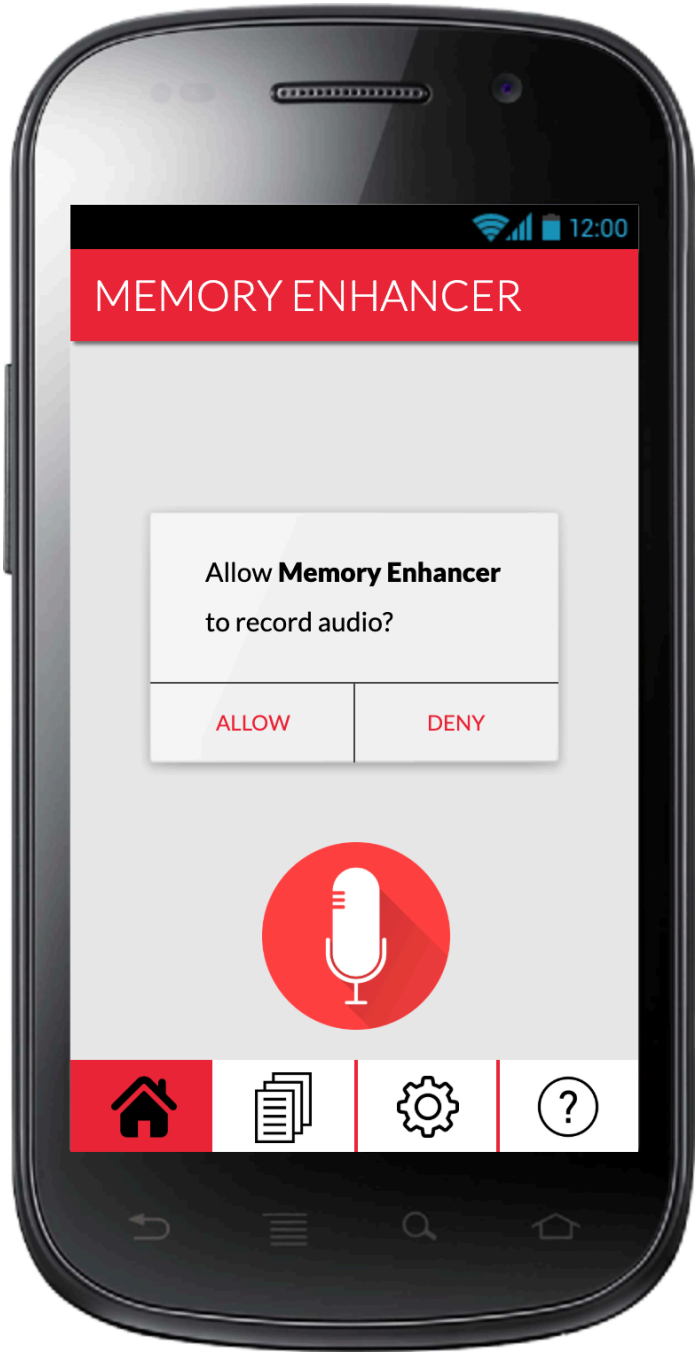

Figure 3: The Audio Access Permission Interface

The Event Trigger Keywords UI enables the user to provide the specific keywords used to trigger the various events (*i.e.* Start Recording, Stop Recording and Playback Reminder Notes). Figure 4 illustrates the Event Trigger Keywords UI.

Figure 4: The Event Trigger Keywords Interface

The user will access their saved reminder notes through the Reminder Notes view, which is illustrated by Figure 5. The interface offers zoom buttons that enable the user to enlarge or reduce the text fonts for readability. With each reminder note comes a delete button (red button with white X) that allows the user to delete the reminder note. A Confirm Delete pop-up is presented to the user to confirm the delete request, as illustrated by Figure 6.

Figure 5: The Reminder Notes Interface

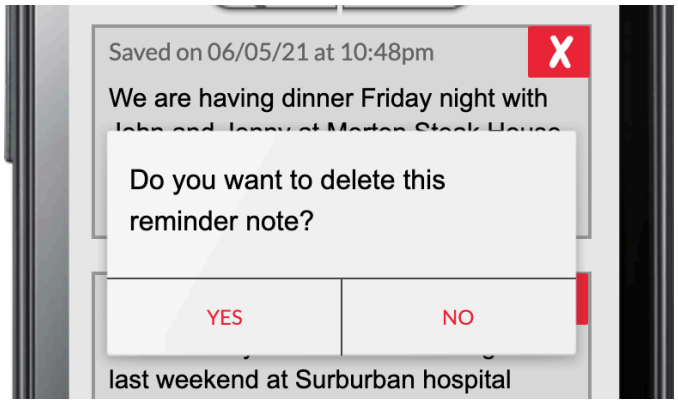

Figure 6: The Reminder Note Deletion Confirmation Pop-up

Selecting a reminder note will open it in edit mode in the Edit Reminder Note view, which is illustrated in Figure 7.

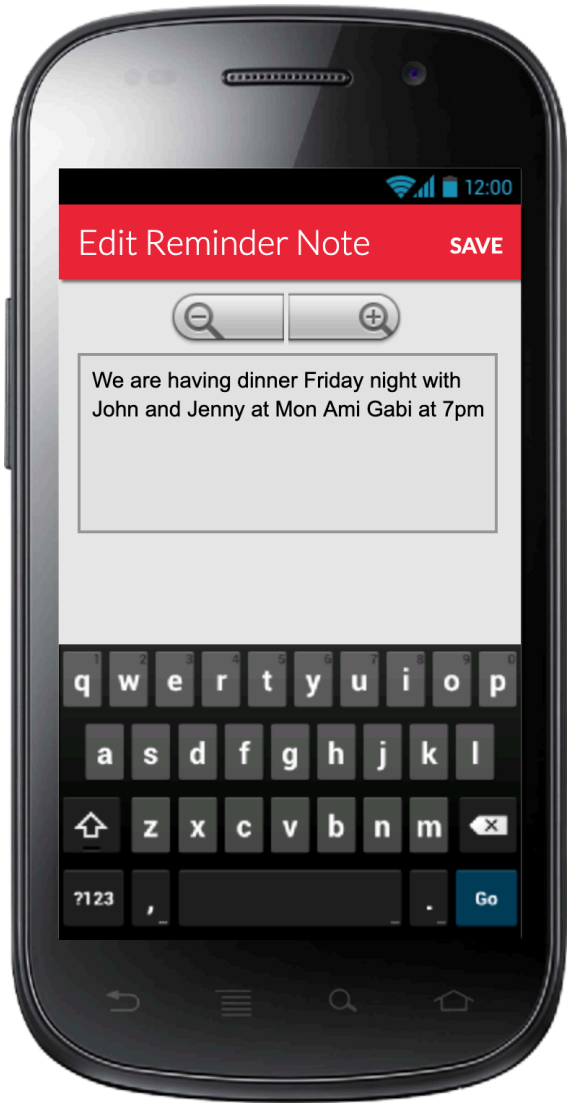

Figure 7: The Edit Reminder Note Interface

The Help section view offers answers to user's frequently asked questions and concerns. Figure 8 illustrates the Help section interface.

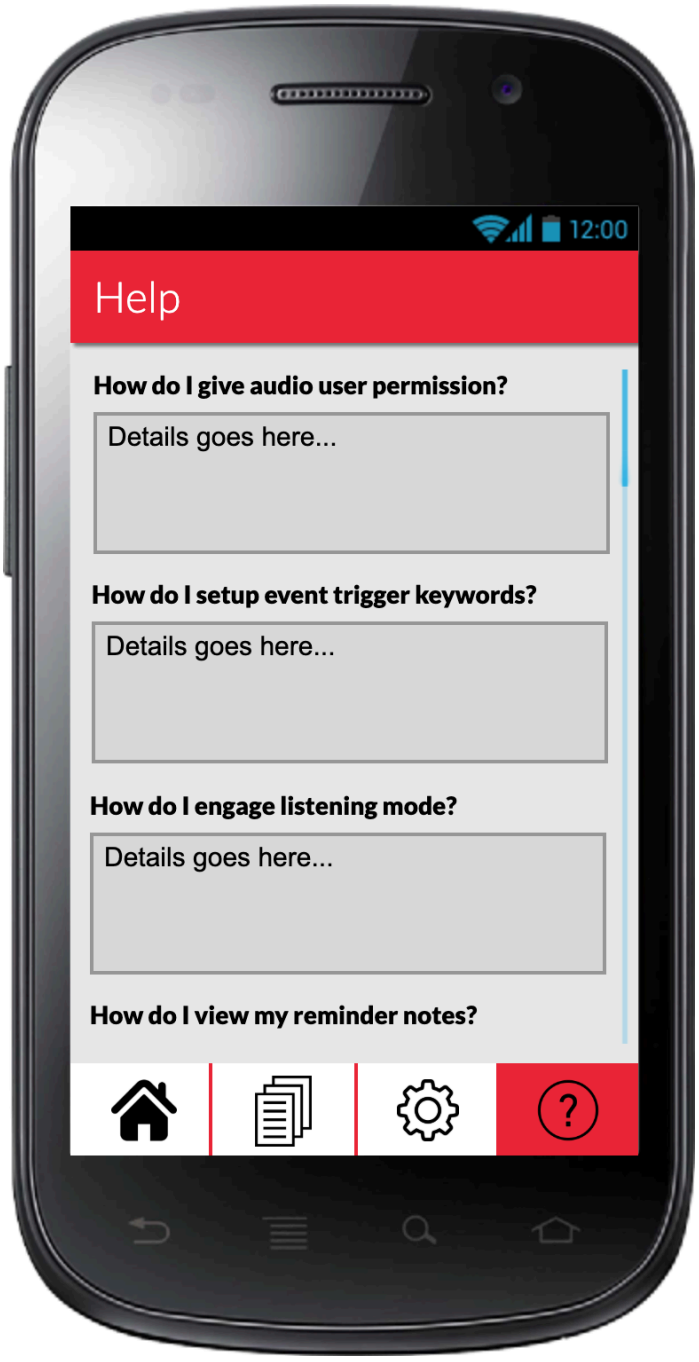

Figure 8: The Help Section Interface

4.2 Hardware Interfaces

No hardware interfaces have been identified. The Memory Enhancer application will be a self-contained installation on an Android/iOS mobile device. All external communications will be with a cloud service provider system; therefore, there is no need for hardware.

4.3 Software Interfaces

SI-1: The system shall be developed as an Android and iOS mobile application, which will be installed on smartphones running on the following Android operating systems: Android 7.0 Nougat, Android 8.0 Oreo, Android 9.0 Pie, Android 10, Android 11, Android 12, iOS10, iOS11, and iOS12.
SI-2: The system will interface with open-source Flutter framework, Dart plugins and libraries.
SI-3: The system with interface with open-source speech recognition library "Speech-to-Text."
SI-4: The system will not use a database.
SI-5: The Android Studio integrated development environment (IDE) will be used for the development of the system as it integrates well with the Flutter framework and Dart language development.
SI-6: The Android emulator will be used to test the application on a virtual smartphone, enabling faster development and testing. Additionally, the Android emulator enables testing with different screen sizes and Android operating system versions.
SI-7: A GitHub repository will be used to manage the application code base, change versioning, builds and releases.

4.4 Communication Interfaces

CI-1: The system shall interface with the microphone of the installation device (smartphone), the Bluetooth headset and the wire-connected headset to capture the user spoken words.
CI-2: The system shall interface with the speakers of the installation device (smartphone), the Bluetooth headset and the wire-connected headset to communicate assisting audio messages to the user.
CI-3: The system shall interface with the installation device (smartphone) network components to use the Internet connection.

5 System Features/Modules

5.1 Request User Permission to Use the Device Microphone

5.1.1 Description and Priority

If the system user successfully installs the Memory Enhancer application on their smartphone device and launches it for the first time since its installation, the application requests the permission to access and use the microphone of the device. A pop-up request to approve microphone use is displayed to the user with options to accept or decline. If the user declines the permission request, the application cannot function as its access to the microphone will be blocked by the device, and this is a critical component for the proper operation of the application. **Priority 1 (High)**

5.1.2 Stimulus/Response Sequences

Stimulus: A user clicks the application icon on the device.
Response: The system opens the application, loads the splash screen, displays the home screen, and displays a popup with the message *"Allow **Memory Enhancer** to record audio?"*, "Deny" and "Allow" buttons.

Stimulus: The sender clicks the "Allows" button.
Response: The system closes the message pop-up, enables the microphone access setting, and navigates the user to the "Manage Trigger Keywords" view (System Feature 5.3) to initially setup the event trigger keywords.

Stimulus: The sender clicks the "Deny" button.
Response: The system closes the message pop-up, disables the microphone access setting, returns the user to the home screen view and displays a message *"Memory Enhancer can work until microphone access is given. Allow microphone access in your device settings."*

5.1.3 Functional Requirements

REQ-1.1: Upon a user launching the application for the first time, the system shall (a) display a popup with the message *"Allow **Memory Enhancer** to record audio?"*, and (b) display the function buttons "Deny" and "Allows".
REQ-1.2: Upon the user clicking the "Allow" button, the system shall (a) close the message pop-up, (b) enable the microphone access setting, and (c) return the user to the "Manage Trigger Keywords" view (System Feature 5.3) to initially setup the event trigger keywords.
REQ-1.3: Upon the user clicking the "Deny" button, the system shall (a) close the message pop-up, (b) disable the microphone access setting, (c) return the user to the home screen view, and (d) display a message *"Memory Enhancer can work until microphone access is given. Allow microphone access in your device settings."*

5.2 Initial Setup Trigger Keywords for Recording and Playback

5.2.1 Description and Priority

If the system user successfully installs the Memory Enhancer application on their smartphone device and launches it for the first time since its installation, the application requests the user to set up the keywords that will be used to trigger the recording of the user's spoken words and to replay previously saved conversations. **Priority 1 (High)**

5.2.2 Stimulus/Response Sequences

Stimulus: A user clicks the application icon on the device.
Response: The system opens the application, loads the splash screen, displays the home screen, and displays a popup with the message *"Allow **Memory Enhancer** to record audio?"*, "Deny" and "Allow" buttons.

Stimulus: The sender clicks the "Allows" button.

Response: The system closes the message pop-up, enables the microphone access setting, and navigates the user to the "Manage Trigger Keywords" view (System Feature 5.3) to initially setup the event trigger keywords.

5.2.3 Functional Requirements

REQ-2.1: Upon a user launching the application for the first time, the system shall (a) display a popup with the message *"Allow **Memory Enhancer** to record audio?"*, and (b) display the function buttons "Deny" and "Allows".

REQ-2.2: Upon the user clicking the "Allow" button, the system shall (a) close the message pop-up, (b) enable the microphone access setting, and (c) navigate the user to the "Manage Trigger Keywords" view (System Feature 5.3) to initially setup the event trigger keywords.

5.3 Manage Trigger Keywords for Recording and Playback

5.3.1 Description and Priority

If the user has already setup trigger keywords that will be used to trigger the recording of the user's spoken words and to replay previously saved conversations, they can manage them by adding new ones, updating, and deleting existing ones. **Priority 1 (High)**

5.3.2 Stimulus/Response Sequences

Stimulus: A user selects the "Triggers" menu button.
Response: The system navigates the user to the "Manage Trigger Keywords" view, displays a text area for the keywords triggering the recording events, a text area for the triggers keywords that will stop the recording, a text area for the keywords triggering the replay of the stored translations, and a "Save" button to persist the user changes.

Stimulus: The user selects a text area.
Response: The system sets focus to the text area so that the user can type in text.

Stimulus: The user clicks the "Save" button.
Response: The system persists the user changes.

5.3.3 Functional Requirements

REQ-3.1: Upon a user selecting the "Triggers" menu button, the system shall (a) navigate the user to the "Manage Trigger Keywords" view, display (b) a text area for the keywords triggering the recording events, (c) a text area for the triggers keywords that will stop the recording, (d) a text area for the keywords triggering the replay of the stored translations, and (e) a "Save" button to persist the user changes.

REQ-3.2: Upon the user selecting a text area, the system shall system set focus to the text area so that the user can type in text.

REQ-3.3: Upon the user clicking the "Save" button, the system shall persist the user changes.

REQ-3.4: If the user clicks the "Save" button and there is at least one text area without values, the system shall display the error message *"Trigger keywords are required for all events"*.

5.4 Activate Conversation Listening Mode

5.4.1 Description and Priority

If the user has successfully installed the Memory Enhancer application and completed the initial setup (*i.e.* allow microphone use and setting up the trigger keywords), they can activate the conversation listening mode by tapping a button on the home screen. **Priority 1 (High)**.

5.4.2 Stimulus/Response Sequences

Stimulus: A user clicks the "Listening" button.
Response: The system initiates the conversation listening mode and displays a confirmation message *"I am now listening to you and I am ready to assist you."* (**Note** – a confirmation voice message should be avoided since the other parties in the conversation should not be aware of the user application).

5.4.3 Functional Requirements

REQ-4.1: Upon the user clicking on the "Listening" button, the system shall (a) initiate the conversation listening mode and (b) display a confirmation message *"I am now listening to you and I am ready to assist you"*.
REQ-4.2: If the microphone use permission was not given to the application, the system shall (a) not initiate the conversation listening mode and (b) display an error message *"I cannot help you since I do not have access to your device microphone. Please activate give me microphone permission access in your device settings."*
REQ-4.3: If the trigger keywords have not been setup, the system shall (a) not initiate the conversation listening mode and (b) display an error message *"I cannot help you since you have not setup the trigger keywords. Please setup the trigger keywords."*

5.5 Terminate Conversation Listening Mode

5.5.1 Description and Priority

If the user has initiated the conversation listening mode, the user can terminate the conversation listening mode by tapping the same button, on the home screen, that activated the conversation listening mode. **Priority 1 (High)**.

5.5.2 Stimulus/Response Sequences

Stimulus: A user clicks the "Listening" button.
Response: The system terminates the conversation listening mode and displays a confirmation message *"I hope I was able to assist you. Your notes are available in the note section."*

5.5.3 Functional Requirements

REQ-5.1: Upon a user clicking on the "Listening" button, the system shall (a) terminates the conversation listening mode and (b) display a confirmation message *"I hope I was able to assist you. Your notes are available in the note section."*

5.6 Transcribe and Save User's Speech

5.6.1 Description and Priority

If the user has initiated the conversation listening mode, when the user is speaking, their spoken words are listened, transcribed, analyzed, and saved as reminder notes if necessary. No voices other than the user's voice shall be recognized by the application. **Priority 1 (High)**.

5.6.2 Stimulus/Response Sequences

Stimulus: A user utters words
Response: The system listens to the user's words, transcribes, and analyzes them for event trigger keywords.

Stimulus: A user utters trigger keywords to record his spoken words (*e.g.* "So, you are saying", etc.).
Response: The system starts storing the transcribed words following the trigger keywords.

Stimulus: A user utters trigger keywords to stop recording his spoken words (e.g. "Okay, it is noted", etc.).
Response: The system ends the recording, saves the converted words, following the trigger keywords, as reminder notes, and continues listening to the user's word.

5.6.3 Functional Requirements

REQ-6.1: Upon a user uttering words, the system shall (a) listen to the user's words, (b) transcribe and analyze them for even trigger keywords.
REQ-6.2: Upon a user uttering trigger keywords to record his spoken words (*e.g.* "So, you are saying", etc.), the system shall start storing the transcribed words following the trigger keywords.
REQ-6.3: Upon a user uttering trigger keywords to stop recording his spoken words (*e.g.* "Okay, it is noted", etc.), the system shall (a) end the recording, (b) save the converted words, following the trigger keywords, as reminder notes, and (c) continue listening to the user's word.
REQ-6.4: If the system cannot transcribe the user's words, the system shall (a) display and play an informational message *"I didn't' get it; could you please repeat it."* and (b) continue listening to the user's word.

5.7 Retrieve and Playback User's Reminder Notes

5.7.1 Description and Priority

If the user has initiated the conversation listening mode, when the user is speaking, his spoken words are listened, transcribed, and analyzed. If the uttered words are trigger keywords to seek a reminder assistance from the application, the matching reminder notes are retrieved, synthetized, displayed and played back to the user. **Priority 1 (High)**.

5.7.2 Stimulus/Response Sequences

Stimulus: A user utters words

Response: The system listens to the user's words, transcribes, and analyzes them for event trigger keywords.

Stimulus: A user utters trigger keywords to playback reminder notes (*e.g.* "Thinking of", "Talking about", etc.).
Response: The system searches for stored conversations matching the uttered words, displays and plays matched reminder notes back to the user.

5.7.3 Functional Requirements

REQ-7.1: Upon a user uttering words, the system shall (a) listen to the user's words, (b) transcribe and analyze them for even trigger keywords.
REQ-7.2: Upon a user uttering trigger keywords to play back reminder notes (*e.g.* "Thinking of", "Talking about", etc.), the system shall (a) match uttered words to stored reminder notes and (b) display and playback the matched reminder notes to the user.
REQ-7.3: If the system cannot transcribe the user's words, the system shall (a) display and play an informational message *"I didn't' get it; could you please repeat it."* and (b) continue listening to the user's word.
REQ-7.4: If the system cannot match the user's words to any reminder notes, the system shall (a) display and play an informational message *"Sorry, I could not find a reminder note matching your request"* and (b) continue listening to the user's word.

5.8 Manage Reminder Notes

5.8.1 Description and Priority

If the user has had his spoken words successfully converted in reminder notes, the user can access those saved reminder notes to view and manage them. **Priority 1 (High).**

5.8.2 Stimulus/Response Sequences

Stimulus: A user clicks on the "Reminder Notes" button.
Response: The system navigates the user to "Reminder Notes" view, displays all the saved reminder notes with a "X" icon at the top right of each note.

Stimulus: A user clicks on the "X" icon at the top right of a note.
Response: The system displays a delete confirmation message "Are you sure you want to delete this note?" dialog with two (2) buttons: "Yes" and "No.

Stimulus: A user clicks the "Yes" button on the delete confirmation message dialog.
Response: The system closes the confirmation message dialog and deletes the reminder note.

Stimulus: A user clicks the "No" button on the delete confirmation message dialog.
Response: The system closes the confirmation message dialog.

Stimulus: A user selects a reminder note.

Response: The system navigates to the "Edit Reminder Note" view and displays the reminder note in an editable text area and displays a "Save" button at the top right of the view.

Stimulus: A user selects the editable text area.
Response: The system displays a typing keyboard.

Stimulus: A user modifies the reminder note.
Response: The system reflects the changes in the text area.

Stimulus: A user clicks the "Save" button on the "Edit Reminder Note" view.
Response: The system saves the reminder note changes and navigates the user back to the "Reminder Notes" view.

5.8.3 Functional Requirements

REQ-8.1: Upon a user clicking on the "Reminder Notes" button, the system shall (a) navigate the user to "Reminder Notes" view and (b) display all the saved reminder notes with an "X" icon at the top right of each note.
REQ-8.2: Upon a user clicking on the "X" icon at the top right of a note, the system shall display a delete confirmation message "Are you sure you want to delete this note?" dialog with two (2) buttons: "Yes" and "No.
REQ-8.3: Upon a user clicking the "Yes" button on the delete confirmation message dialog, the system shall (a) close the confirmation message dialog and (b) delete the reminder note.
REQ-8.4: Upon a user clicking the "No" button on the delete confirmation message dialog, the system shall close the confirmation message dialog.
REQ-8.5: Upon a user selecting a reminder note, the system shall (a) navigate the user to the "Edit Reminder Note" view and (b) display the reminder note in an editable text area and (c) display a "Save" button at the top right of the view.
REQ-8.6: Upon a user selecting the editable text area, the system shall display a typing keyboard.
REQ-8.7: Upon a user modifying a reminder note, the system shall reflect the changes in the text area.
REQ-8.8: Upon a user clicking the "Save" button on the "Edit Reminder Note" view, the system shall (a) save the reminder note changes and (b) navigate the user back to the "Reminder Notes" view.
REQ-8.9: If a user clears the editable text area and clicks the "Save" button, the system shall display a delete confirmation message "Are you sure you want to delete this note?" dialog with two (2) buttons: "Yes" and "No.

5.9 Navigate through the System

5.9.1 Description and Priority

If the user has successfully installed the Memory Enhancer application, they will be able to navigate through the various views of the application (*i.e.* Homepage, Reminder Notes, Trigger Keywords and Help Section) using the menu bar. **Priority 1 (High).**

5.9.2 Stimulus/Response Sequences

Stimulus: A user clicks the Homepage navigation icon on the navigation menu.
Response: The system displays the “Homepage” view.

Stimulus: A user clicks the Reminder Notes navigation icon on the navigation menu.
Response: The system displays the “Reminder Notes” view.

Stimulus: A user clicks the Settings navigation icon on the navigation menu.
Response: The system displays the “Event Trigger Keywords” view.

Stimulus: A user clicks the Help navigation icon on the navigation menu.
Response: The system displays the “Help Section” view.

5.9.3 Functional Requirements

REQ-9.1: Upon the user clicking on the Homepage navigation icon on the navigation menu, the system shall display the “Homepage” view.
REQ-9.2: Upon the user clicking on the Reminder Notes navigation icon on the navigation menu, the system shall display the “Reminder Notes” view.
REQ-9.3: Upon the user clicking on the Settings navigation icon on the navigation menu, the system shall display the “Event Trigger Keywords” view.
REQ-9.4: Upon the user clicking on the Help navigation icon on the navigation menu, the system shall display the “Help Section” view.

5.10 Zoom In/Out

5.10.1 Description and Priority

Given that the user has successfully installed the Memory Enhancer application, this functionality allows the user to zoom in and out of any area of the application currently presented on-screen for greater clarity on text. **Priority 2 (Medium).**

5.10.2 Stimulus/Response Sequences

Stimulus: A user holds or clicks the (+) button.
Response: The system zooms increasing the font size of the screen text by two (2) points. The font size continues to increase at the same rate each half second while the (+) button is held.

Stimulus: A user holds or clicks the (-) button.
Response: The system zooms decreasing the font size of the screen text by two (2) points. The font size continues to decrease at the same rate each half second while the (-) button is held.

5.10.3 Functional Requirements

REQ-10.1: Upon the user clicking the (+) button the font size of the screen text increases by (2) points.
REQ-10.2: Upon the user holding the (+) button the font size of the screen text increases by (2) points each half second.

REQ-10.3: Upon the user clicking the (-) button the font size of the screen text decreases by (2) points.
REQ-10.4: Upon the user holding the (-) button the font size of the screen text decreases by (2) points each half second.

5.11 Training Videos

5.11.1 Description and Priority

Given that the user has successfully installed the Memory Enhancer application, this functionality provides the user with access to official training video tutorials. The expectation is that the user easily understands functional aspects of the application once requested training video on any particular subject is viewed. **Priority 2 (Medium).**

5.11.2 Stimulus/Response Sequences

Stimulus: A user holds or clicks “Help” navigation icon.
Response: The system displays the “Help Section” view including “Video Tutorials” subsection.

Stimulus: A user clicks “Memory Enhancer Functions” video.
Response: A straightforward, in-depth tutorial video plays on screen.

5.11.3 Functional Requirements

REQ-10.1: Upon the user clicking the “Help” icon, the user navigates to the “Help Section” view

REQ-10.2: Upon the user clicking on any tutorial video under the “Video Tutorials” subsection, respective video displays on screen.

5.12 Search

5.12.1 Description and Priority

Given that the user has successfully installed the Memory Enhancer application, this functionality provides the user with a way to search through saved messages. This can be done by typing a word or phrase to search for or by using a voice queue. **Priority 2 (Medium).**

5.12.2 Stimulus/Response Sequences

Stimulus: A user holds or clicks “Search” navigation icon.
Response: The system displays an onscreen keyboard for typing.

Stimulus: The user types a phrase they wish to search for.
Response: The system displays a list of saved messages that contain the phrase.

Alternate:

Stimulus: The user speaks a designated phrase such as “Please search for” followed by the phrase to be searched.
Response: The system displays a list of saved messages that contain the phrase.

5.12.3 Functional Requirements

REQ-10.1: Upon the user clicking the “Search” icon, the application displays an onscreen keyboard for input.

REQ-10.2: Upon the user speaking a designated phrase the application will begin listening for something to search for.

REQ-10.3: Upon the user typing or speaking a phrase to be searched for the system displays a list of saved messages containing that phrase.

6 Event Trigger Keywords

6.1 Start Recording Event Trigger Keywords

This section elaborates the keywords that will trigger the event for the application to start recording the user’s uttered words.

- *So, you are saying…*
- *Start recording*
- *I should remember*

6.2 Stop Recording Event Trigger Keywords

This section elaborates the keywords that will trigger the event for the application to stop recording the user’s uttered words.

- *Okay, it is noted…*
- *I got it…*

6.3 Playback Reminder Notes Event Trigger Keywords

This section elaborates the keywords that will trigger the event for the application to search and playing back reminder notes matching the user's uttered words.

- *Talking about…*
- *Referring to…*

7 Nonfunctional Requirements

7.1 Performance

NF-1.1: The application splash screen shall not take more than two (2) seconds to display once the icon is selected.
NF-1.2: The application homepage screen shall be displayed within five (5) seconds of the splash screen display.
NF-1.3: All the application pages generated by the system shall be rendered and displayable within three (3) seconds, using space placeholders until widgets are downloaded and available to display and use.
NF-1.4: The application shall provide conversation feedback assistance to the user within three (3) seconds.
NF-1.5: The application shall be able to recover conversation transcription data in the event of a failure, such as an application crash, to continue supporting the user.
NF-1.6: The application shall send a reminder notification once per day to the user's home/lock screen.

7.2 Security

NF-2.1: The system shall protect all communications between the user's mobile device and the cloud infrastructure using the highest encryption standard available, which should be at least a 128-bit encryption.
NF-2.2: The privacy of people other than the application user shall be always protected by not recording their spoken words.
NF-2.3: The application should not require user authentication because the user may not remember their credentials due to their short memory handicap.
NF-2.4: The application shall delete stored messages after they are 1 week old.

7.3 Quality

NF-3.1: The system shall be available to users 99.9% of the time whenever the user launches it.
NF-3.2: The system shall support the English language only.
NF-3.3: The system shall support UTF-8-character encoding to properly interpret all text characters.
NF-3.4: The system shall only store transcription with a confidence greater than 85%.
NF-3.5: The system shall function properly if there is disturbance of the Internet connection.
NF-3.6: The system shall be 508 compliant to facilitate its use.