

TALKBOX REQUIREMENTS



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VERSION 1.0

GROUP 9

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TABLE OF CONTENTS

1. Introduction	4
2. Project Description	4
3. Project Scope	4
4. Business Drivers	4-5
5. Product Vision	5
6. Functional Requirements	5-6
7. Non-Functional Requirements	7-8
8. Users	8
9. Accepted Test Cases	10-11

Revision History

V.	Date	Author	Description	Status
1	2019-02-24	Neharika Puri	This document talks about the requirements of this project.	DONE
1	2019-02-24	Eric Pham	Edited Use Cases	DONE
1	2019-02-24	Yonis Abokar	Added Accepted Test Cases	DONE

1.0 Introduction

This document states the various requirements for the TalkBox Software. These requirements are based on the project requirements of EECS2311 and the presentation from Prof Baljko. Additional requirements have been added during the SDLC of this project.

1.1 Document Purpose

The purpose of this document is to be an aid to the reader, to understand the needs due to which this product was conceived, an overview of what this product can offer, and the use cases and user needs of the potential users. This document will also discuss the team's vision and what constraints were faced during SDLC and the assumptions used to solve those. Lastly, the reader will be able to see the different test cases used to make user needs and the functionality can align.

2.0 Product Description

This product will help people with special needs to communicate. The TalkBox will be able to talk on behalf of them, when the certain button of that sound would be pressed. The caregivers will be able to record more words in the software and increase the user's word choice.

3.0 Product Scope

This device will aid communication for users who are unable to talk. The user will have the freedom to choose as many buttons they need for their TalkBox. They will also have the flexibility to change the number of the buttons at any time. The users can choose to use the pre-recorded sounds available or they can choose to record different sounds and save it in the buttons.

4.0 Business Drivers

4.1 Cost Difference

This product will replace expensive technologies for a low price. The current technology used by the government for Sound Generating Devices (SGD) are around \$14,000, but this product with software and hardware components by Raspberry Pie will in total cost just around \$50. This big price difference will be a major business driver for this product.

4.2 Features

This product will also be very efficient at its use. It will provide much more features than the current technology used. It will give the user more functionality like recording sounds that they would like to use.

4.3 Ease and Adaptability

This product is very easy to use and is very interactive. The user will be able to adapt to it very quickly. The product can be used by anyone, who has never used technology before even making it becoming popular among potential users.

5.0 Product Vision

The vision of this product is to be an accessibility device to help users who are unable to communicate. The big picture/vision of TalkBox is to be an aid for the users and their caregivers. It will provide both the parties with different communication options whether it is the prerecorded sounds for them to use with ease or the capability to record their own audio and be able to store it in their library. They will be able to use this technology in their everyday life to either communicate or be able to signal their needs.

6.0 Functional Requirements

6.1 Priority

The following are the major functionality of the TalkBox that it must perform :

1. The TalkBox should be able to make buttons according to the input number of buttons given by the user.
2. The TalkBox must have some pre-recorded audios.
3. The TalkBox must allow the user to select the pre-recorded audios and assign them to the buttons.
4. The TalkBox must allow the user to create a profile and synchronize the buttons and sounds in that profile.
5. The TalkBox should let the user record and save their own/personal audio files.
6. The TalkBox must allow the user to launch their profile and play their audios by clicking the button.

6.2 Requirement Category 1 : Buttons

In order to fulfil this requirement, the following requirements should be met:

- There is a place for the user to input the number of buttons
- The configuration, needs to make inputted number of buttons

6.3 Requirement Category 2 and 3 : Pre-Recorded Audios

In order to fulfil this requirement, the following requirements should be met:

- Common sounds/audios files are available for the users to use
- These files are able to get exported along with the software, to any computer or laptop, the software runs on.

6.4 Requirement Category 4: Profile

In order to fulfil this requirement, the following requirements should be met:

- The user is able to make a profile with a desirable name
- The users are able to add sounds to the profile and synchronize it with the buttons.

6.5 Requirement Category 5: Recorded Audios

In order to fulfil this requirement, the following requirements should be met:

- The user is able to record a recording and there are record and stop button for their convenience.
- The user are able to give the recording a desirable name
- The user is able to add the recording in the list of recorded/ pre-recorded audios or sound for the users to select from
- The users are able to select these recording and add them to their profile and buttons.

6.6 Requirement Category 6: Launch and Play

In order to fulfil this requirement, the following requirements should be met:

- There is a button for the user to launch their profile
- The stimulator opens and lets the user launch their profile
- Once launched, the information in the profile such as the number of buttons and the names of the buttons are displayed
- Once any button is pressed, the user is able to hear the audio they initially stored in that button

7.0 Non- Functional Requirements

Some of the Non-Functional Requirements include:

1. The Talkox must be very easy to use for both the patient and their caregiver.
2. The TalkBox must have a very short setup and execution time.
3. The TalkBox must be interactive to increase the adaptability of the device.

7.1 Requirement Category 7: Ease

In order to fulfil this requirement, the following requirements should be met:

- There are no additional buttons that are not required
- The screen is organized and are separated by uses
- Import buttons are identified and easy to access
- The layout is simple yet interactive
- The component placements provide ease for the user

7.2 Requirement Category 8: Time

In order to fulfil this requirement, the following requirements should be met:

- The program is coded in an efficient way
- Algorithm's time complexity is small and unnecessary processing is avoided
- Functionality not used is avoided after comparing results with test coverage
- The program is easy to install and run

7.3 Requirement Category 9: Interactive

In order to fulfil this requirement, the following requirements should be met:

- The application design is eye catching
- The layout is easy on the eye, and not very busy
- No background in technology required

8.0 Users

8.1 User Characteristic

There are 2 types of users for this device:

Patient: The patient is the major user as they are characterized as a user, who is unable talk and needs an aid for communication. There could be a different range for the need of this product, the patient might be able to talk a bit but struggle with forming sentences. The patient might not be able to say a single word. For these users, this device will be their major mean of communication. They will be able to use it to call people or even be able communicate their need. For example, if they need water or something, they are not feeling well, if they need to use the washroom. Moreover, they can set sounds for various things as signals; they can have yes or no buttons to answer people. This user will be using this device very often and hence needs something accessible and easy to use.

Care Giver: The care giver can use this to record sounds/audios for the patient. He/she should also be able to use the device with ease as they might not be great with technology either. Hence, it's important that they are able to meet their requirements in minimal steps and find the whole process simple, easy and interactive.

8.2 Constraints

The TalkBox must be very easy to work with, whether it being easy to press the buttons, or it being easy to record, click and add. The TalkBox must also be resizable, so the user is able to zoom and it should also be set up in a way, that the ergonomics are good.

8.3 Assumptions and Dependencies

The overall design will depend on each individual. But the goal is to think of a common good for both the users who are patients and the users who are the caregivers. Some of the assumptions include the fact that the patient might struggle with pressing the buttons, so the buttons should be very easy to press. Both, the user parties might not be well versed with technology. So it is essential that the technology is enough to understand and adapt to. They also should not see any type of errors or crashes which leaves them confused and frustrated with the technology. So it must be the case, that the developers handle the back end very well. As the overall user experience is dependent on the design and functionality of the device.

8.4 User Requirements

Patient

- They want the device to be very simple to use
- They want that the processing time is to its bare minimum
- They want that the device is interactive
- They want the app to be eye-catching and not boring, as they might be spending a lot of time with the device.
- They want to have a lot of functionality that is accessible to them
- They want choices, such as various pre-recorded audios that they can use as their signal sounds.
- They want the layout and design to be ergonomic.

Care Giver

- They want something, that is also easy to use.
- They don't want complex device, as they are required to help the patient.
- They don't want a device that needs a lot of trouble-shooting, as they might not be well versed with the technology.
- They want something interactive and functional, which allows them to also enjoy while they are trying to assist the patient.

8.5 Specific Requirements

2 apps are used to handle the requirements of the software:

Configuration App:

- An app based on GUI, which offers the user an interactive layout with the functionality.
- Its main role is to help the device with the configuration of the audio. It uses profile and buttons to store the info, which can then be passed to the Simulator.

Simulator:

- Its major role is to behave as a hardware device, which simulates the device's behaviour.
- The same user interface as the device is used on it.
- It uses the information configured by the profile and buttons.

8.6 Interface Requirements

As there are two apps, there will also be two interfaces.

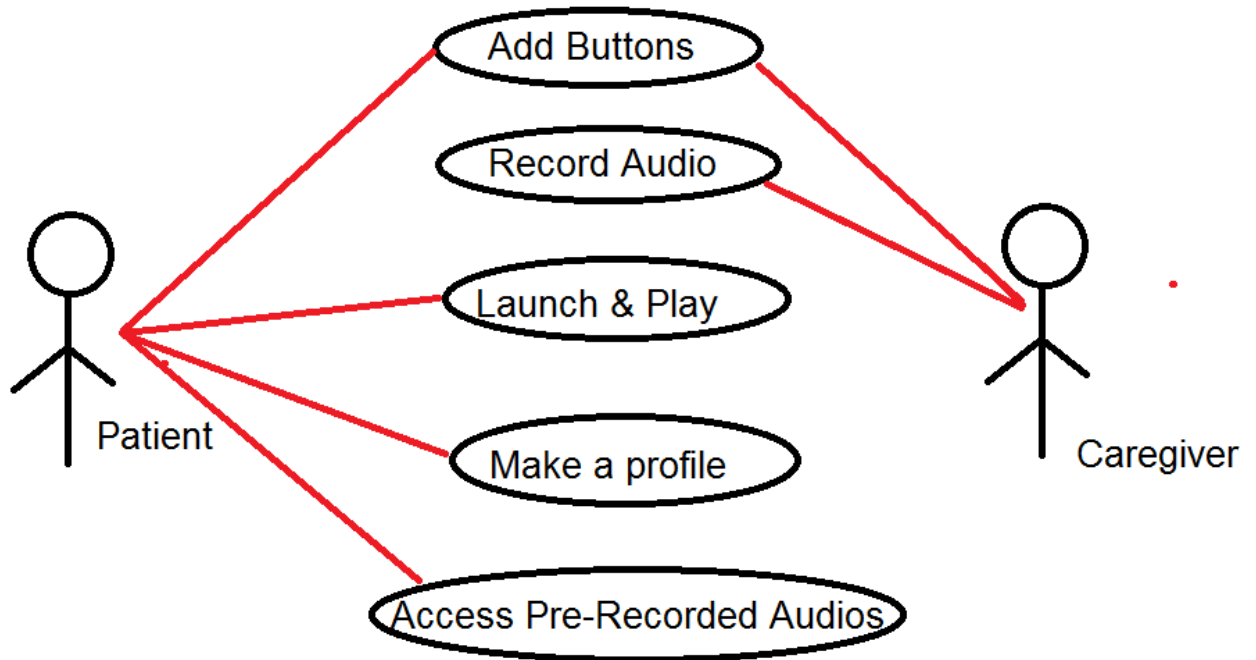
The TalkBox Device Interface: For this version, this will be a simulator that can be used on a computer. For the next version, it will be replaced by the raspberry pie hardware. Which means rather than pressing a hardware button, the users will be clicking the buttons. Except that the simulator behaves as the hardware will behave.

The Configurator Interface: This will remain the same, whether the product is used on a computer or hardware. It will still do its task of assigning audios and audio names to buttons and assigning buttons to the profile.

8.7 Use Cases

Actors: Patient and Caregiver

UML Diagram



Situational Use Case

1. A user who cannot communicate at all: In this case, the user will be very much dependant on the device for basic assistance like getting something, using the washroom or expressing the feelings.
2. School/ Day Care/Work - In this setting, the user might be a little independent, but still struggles with communication (they might be autistic). At this time, the device will provide an aid and help him communicate comfortably.
3. Social Interactions- If the user is very anti-social as they are not comfortable communicating. They will be able to use the device and be able to talk to others and not feel lonely or as if they are not heard.
4. New Device Training- Both the caregiver and the patient will go through some learning/training for the usage, this will be their first interaction with this device and could be their first interaction with technology. It is very important that the system is not complex as the first impression will decide the adaptability to the product.

Functional Use Case

Use Case 1 (Impaired User)

Description: The user wants to play audio

Steps:

- 1) User launches TalkBox Device
- 2) User creates their profile and add audio to their customized profiles
- 3) User Sets which profile they want to be active by pressing “Set Profile”
- 4) User presses the launch button to launch the interface with selected profile

Use Case 2 (Caretaker Recording Audio)

Steps:

- 1) User launches TalkBox Device
- 2) User enters the name of their recording
- 3) User clicks on record button and records audio via microphone
- 4) User clicks on stop when done
- 5) Audio file is recorded and can be added to a profile via case 1.

Use Case 3 (User imports their own Audio Files)

Steps:

- 1) User launches TalkBox Device
- 2) User clicks on File from drop down menu
- 3) User clicks on import
- 4) User imports audio file
- 5) Audio is now imported to ListofAudio
- 6) Audio file can be added to profile via case 1

Use Case 4 (User wants to import TalkBoxData.tbc file)

- 1) User launches TalkBox Device
- 2) User clicks on File from drop down menu
- 3) User clicks on Load Profile
- 4) The profile is now loaded into the TreeView
- 5) Audio File can be added to profile via case 1

9.0 Accepted Test Cases

- 1) Pass all the stated test cases in the Testing Manual

The first test we would like to pass is to be able to pass all the test cases in the testing manual. This is because, if all those test cases are pass, then the all the features of the TalkBox should work properly

- 2) Successfully work as a jar application

The TalkBox configurator and simulator both works perfectly when ran in the eclipse environments, however, when exported to jar, there are many functionalities that could go wrong. We want the jar to work properly without any errors