EECS 2311 Software Requirements Specification

for

<Talk Box>

Version vM approved

Prepared by <Tony, Nasif, Amaan>

<EECS 2311 Project>

<February 24, 2019>

Table of Contents

Revision History

Name	Date	Reason For Changes	Version
Mohammed Haque	24/02/19	Midterm Submission Draft	vM
Tony Ly	04/02/19	Initial Lab Task Draft	v1.0

1. Introduction

1.1 Purpose

The purpose of this document is to give a detailed breakdown of the requirements for the EECS 2311 Talk Box software project and how it satisfies the needs of the customer. This document is primarily intended to be proposed to a customer for its approval and a reference for developing the first version of the system for the development team. It will cover the purpose, use, system features, common usage cases, external and nonfunctional requirements.

1.2 Intended Audience and Reading Suggestions

The intended audience for the Talk Box SRS (Software Requirements Specification), consists of participants in York University's, EECS 2311 (Software Development Project).

- Developers can use this document to evaluate the project and gain further insight into where future improvements and features could be added.
- The 2311 Professor and his TAs can use this document as a baseline of what to look for when examining the software and see where future improvements will be made.
- The end user can gain greater knowledge of the software history and the future developments that are planned in later versions and also how it satisfies the requirements of the end user.

The rest of the SRS (Software Requirement Specification) document is organized nicely and you would have no trouble going through all the subtopics sequentially, but you can always jump towards a section that you would like to specifically read.

1.3 Product Scope

The purpose of the Talk Box software is to allow users with speech impairments the ability to communicate confidently and effectively with others around them. It is also for introducing the virtual environment which allows the simulation of the TalkBox. The benefit of the software is that it allows for a cheap low budget Talk Box to be easily created/simulated. Some key objectives for the software is to be able to run on any operating system, easily used by anyone, work for any Talk Box layout, allow for easy changes/modifications, and be useable on a Raspberry Pi. The goal of the software is to not only help mute people communicate but also give Talk Box devices a greater life span, by allowing these device to be easily modified and changed for case by case basis on top letting the users who aren't able to speak, communicate in an effect and intuitive way.

1.4 References

The entire project and all the relevant materials can be found on this GitHub link: https://github.com/amaanvania/TalkBox

2. Overall Description

2.1 Product Perspective

The goal of the Talk Box software is to act as a low budget SGD (Speech-generating device) for users with speech impairments, while they wait for their personalized SGD.

2.2 Product Functions

- Creating new configuration files
- Editing existing configuration files
- Saving configuration files
- Recording Audio
- Opening existing configuration files
- Volume adjusting
- Custom number of Audio buttons
- Ability to add custom images and audio files to audio buttons
- Ability to playback audio files
- Intuitive User interface features like Drag and Drop

2.3 User Classes and Characteristics

Caretakers:
These users can be the parents or any other person or persons that aid the speech impairment (or mute) person in their day to day life. The Talk Box software is very intuitive and only requires basic computer and literacy skills to be able to set the application up in order for the speech impairment (or mute) person to use. There is a user manual that comes with this application that is easy to understand and can be read in order to know how to use this system.

Users with speech impairment:
The common characteristic shared among these users is that they cannot fluently communicate vocally. Since the Talk Box requires physical touches to be used and so it is assumed the user will be able to move their hands/fingers to activate audio buttons. Depending on how the audio button is set, this class of users can effectively communicate with others.

EECS 2311 Professors & Teaching Assistants:
The actors from this group are the most important users, testers and reviewers of the software to ensure the software is available meet the user requirements, the testing of the product, the feedback to improve the product, and the final review of the application.

2.4 Operating Environment

The Talk Box software has been tested and is capable of running on both Linux, Windows and the Mac OS X platforms, assuming the latest version of the Java Runtime Environment (JRE) is installed. The latest version of the JRE can be found on the official Oracle site and you can visit it here.

2.5 Design and Implementation Constraints

The Talk Box software uses JavaFX (https://openjfx.io) for its GUI (Graphical user interface) and is therefore, limited looking wise to what JavaFX allows. Another constraint on the current version of the software is the deadline at February 24, 2019 and there are still future improvements and new features to be added in later versions but because of the strict deadline, those new features will have to wait until the next version of the software.

2.6 User Documentation

Further documentation can be found at the project GitHub repository (Includes the User Manual, the Testing Document, and this Requirements Document):
https://github.com/amaanvania/TalkBox/tree/master/Documentation

If there is any bugs/issues (or feature requests) they can reported directly to:
https://github.com/amaanvania/TalkBox/issues

If you want to reach the developer team who are currently working on the project, reach us via:
https://github.com/amaanvania/TalkBox/wiki

2.7 Assumptions and Dependencies

The user or users have a Java Runtime Environment (JRE) setup that includes the installation of the Java Virtual Machine (JVM) for this application to run. It is also assumed that the user has a working keyboard and a mouse to point and input text onto the screen. It is also assumed that the user have a working microphone to be able to record audio.

There aren't any additional software dependencies but to still point out all the .jar files the TalkBox application uses can be seen below:

- resources.jar
- rt.jar
- jsse.jar
- jce.jar
- charsets.jar
- jfr.jar
- access-bridge-64.jar
- cldrdata.jar
- dnsns.jar

- jaccess.jar
- jfxrt.jar
- localedata.jar
- nashorn.jar
- sunec.jar
- sunjce_provider.jar
- sunmscapi.jar
- sunpkcs11.jar
- zipfs.jar

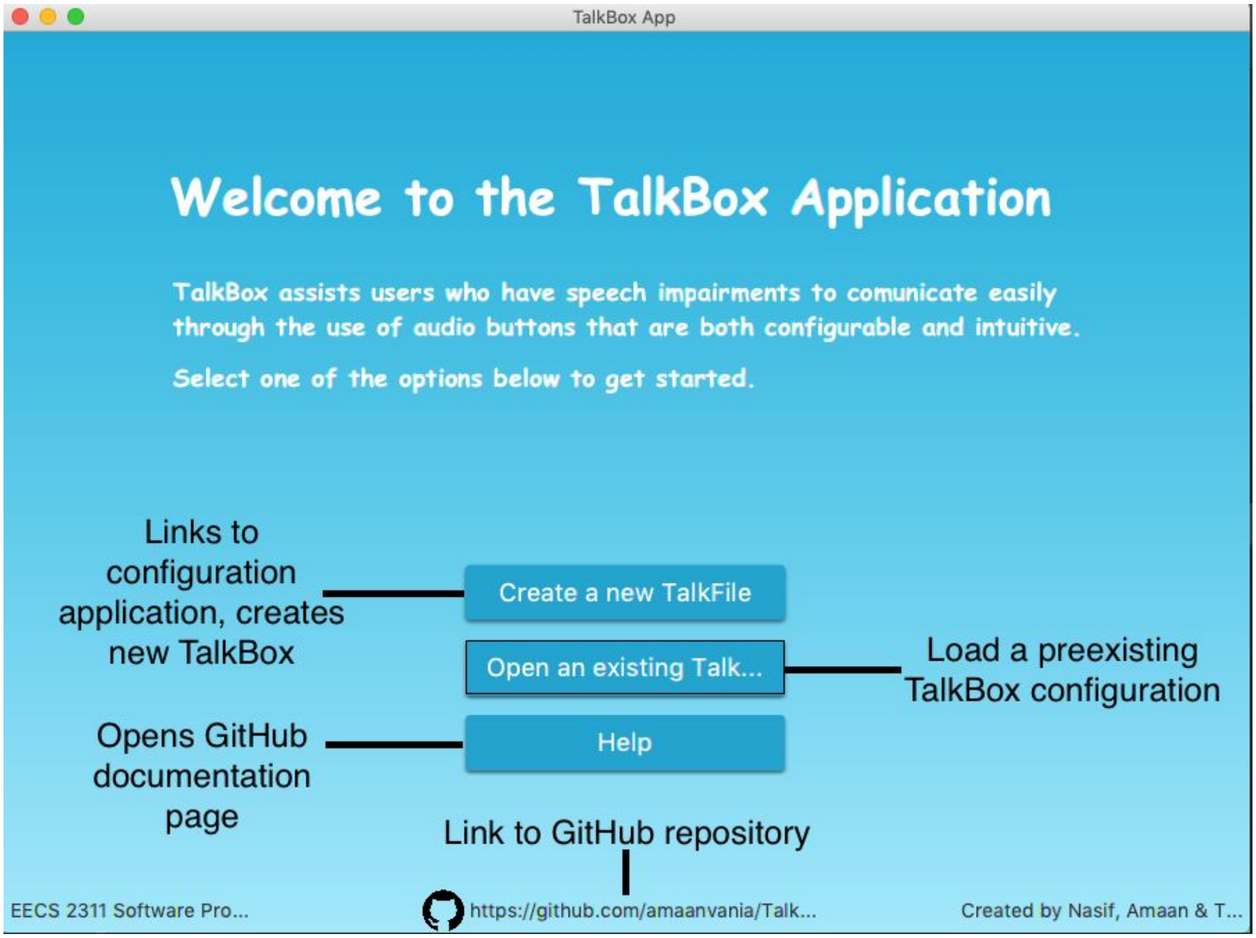
3. External Interface Requirements

3.1 User Interfaces

The TalkBox application comes with two GUIs. The TalkBox Simulator and the TalkBox Configuration App. The Simulator has a welcome screen that allows you to create a .tbc file or open an existing one whereas the Config app allows you to create a new .tbc from scratch or open an existing .tbc file for modification. The two GUIs are very similar for the most part but with a few crucial differences. The Simulator is only for displaying the Audio buttons that gets generated by the Configuration App and all the editing is done in the Configuration App. So, the Configuration App has more features that includes but not limited to, Selecting the no. of buttons you want to see in the Simulator, Recording Audio and Adding audio and images to Audio buttons (Editing) which can all be tested on the TalkBox Simulator.

You can see the Graphical User interfaces in action below:

<u>*TalkBox Simulator Welcome Screen:*</u>



Welcome to the TalkBox Application

TalkBox assists users who have speech impairments to comunicate easily through the use of audio buttons that are both configurable and intuitive.

Select one of the options below to get started.

Create a new TalkFile
Open an existing Talk...
Help
EECS 2311 Software Pro...
https://github.com/amaanvania/Talk...
Created by Nasif, Amaan & T...

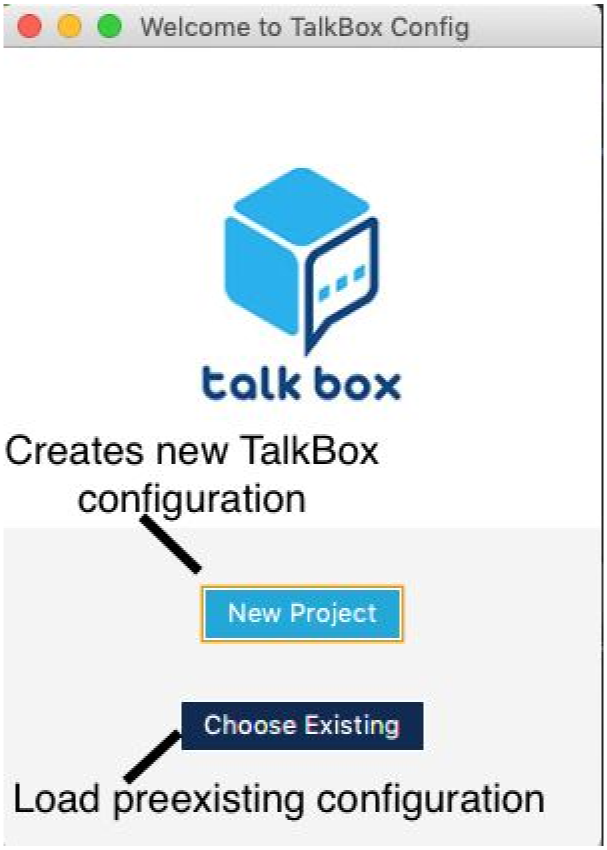
Links to configuration application, creates new TalkBox

Load a preexisting TalkBox configuration

Opens GitHub documentation page

Link to GitHub repository

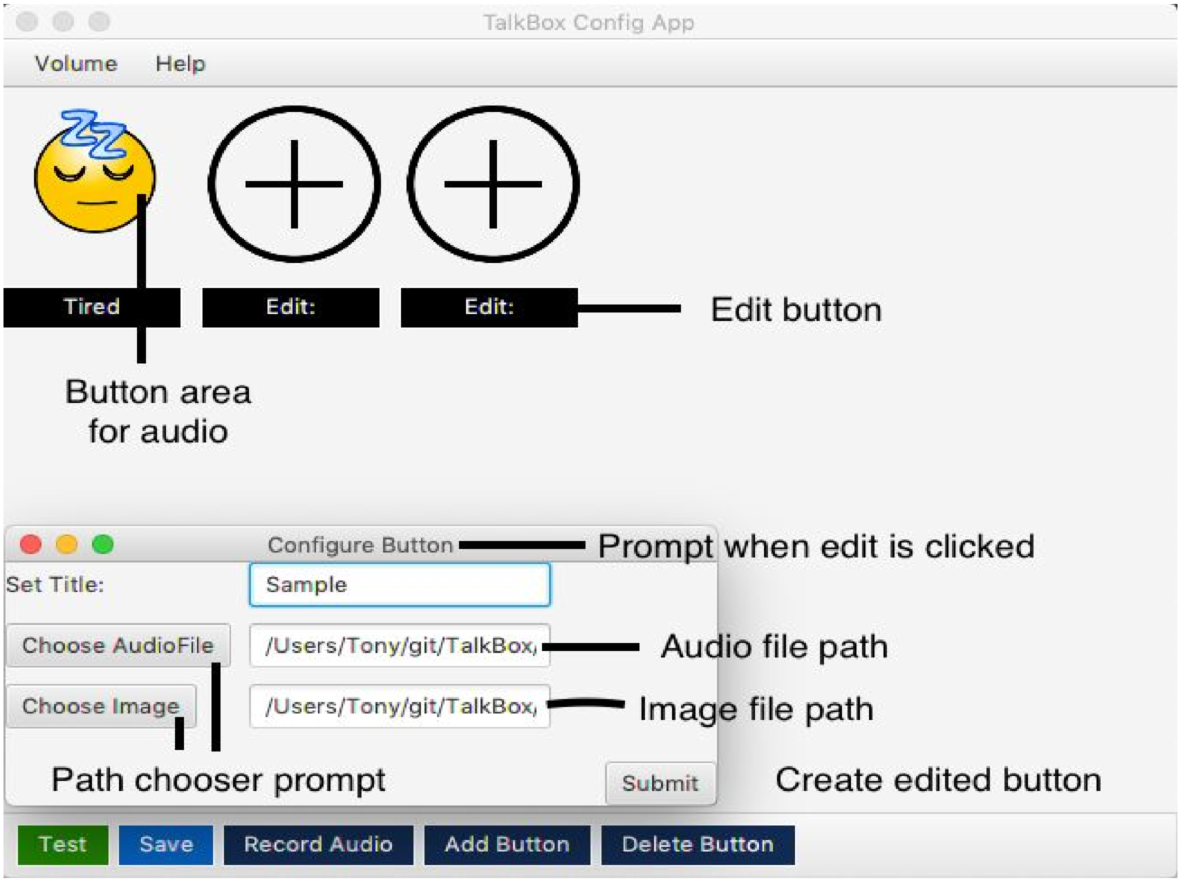
<u>TalkBox Config Opening Screen:</u>



Creates new TalkBox configuration

Load preexisting configuration

TalkBox Config Screen:



3.2 Hardware Interfaces

- Mouse or trackpad required for navigating program (input)
- Keyboard for naming files (input)
- Microphone for audio recording (input)
- Monitor to display the program (output)
- Speakers to play audio clips (output)

3.3 Software Interfaces

The TalkBox application or applications run using the Java Runtime Environment (JRE) version 1.8. It also makes use of the *java.io.serializable* library to ensure that both the simulator and the configuration app communicates effectively through the generation of simple .tbc files that the user can use on either of the applications. The Serialization object that is generated is used to create a serialized file that either of the applications can deserialize and read. More about it's functionality is discussed in the Testing document.

3.4 Communications Interfaces

The TalkBox application or applications do not make use of any online communication interfaces.

4. System Features

Common Use Cases for the applications are noted below. Each application has its own set of use cases.

4.1 TalkBox Configuration App

4.1.1 Configurable Audio Buttons

Audio buttons are special buttons that the configuration app generates. The user can select a desired no. of audio buttons to be put into the configuration app for modification. These audio buttons can be further configured/edited to suit the user's needs. Each of the audio buttons can let the user select whichever audio or image they want to associate with a specific button for use in the simulator. The user has the complete choice of either setting the path of the images/audio in the audio buttons manually or using the intuitive drag and drop feature instead to set the image or audio of a specific audio button. The user can them immediately click on the image of the audio button for audio playback or click on the edit button to select a new audio or image to associate with the audio button.

4.1.2 Saving Files

The Talkbox configuration app allows the user to save progress by allowing the user to save files with a .tbc extension. These files can be opened in the TalkBox simulator for playing or it can be opened by the Configuration app for more editing later on. This allows the user the flexibility of working on multiple different .tbc files for each occasion and they have the freedom of picking up from exactly where they left off.

4.1.3 Testing the file in the TalkBox Simulator

The configuration app allows the user to test the current audio buttons that have been filled in the Simulator itself before moving on to configuring more audio buttons. This feature allows the user to see what their current audio buttons will look and sound like in the simulator itself before they want to use these files in an actual Talkbox running on a Raspberry Pi.

4.1.4 Recording Audio

The Configuration App allows the user to create their own audio by using an interactive way of recording the user's voice assuming they have a microphone installed. The recording feature also creates save files that the user can save on their machine. These recorded audio files can be added to the configurable audio buttons afterwards to make a more personalized environment for the user which can then be carried over to the simulator.

4.1.5 Adjusting the Volume

The Configuration app allows the user to set the volume of the audio playback of the configurable buttons as desired.

4.1.6 Help options

The configuration app allows the user to ask for help depending on what they run into. The help menu allows the user to consult the user manual, to contact the developers regarding anything specific. or report any bug reports that the user comes across.

4.2 TalkBox Simulator

4.2.1 Create a new .tbc file

.tbc files are special files that the application can read in order to do its work. The simulator allows the user to create a new .tbc file from scratch by calling the Configuration app.

4.2.2 Open an existing .tbc file

The simulator gives the user of opening existing .tbc files that user may have created from before in order to simulate the environment that user have already built.

4.2.3 Editing an existing .tbc file

The simulator also allows the editing of the configurable audio buttons through the use of the configuration app in order to modify or update buttons the way the user desires.

4.2.4 Adjusting the volume slider

The simulator allows the user to adjust the volume of the sound the audio buttons make when they are clicked.

4.2.5 Help

The configuration app allows the user to ask for help depending on what they run into. The help menu allows the user to consult the user manual, to contact the developers regarding anything specific. or report any bug reports that the user comes across.

5. Other Nonfunctional Requirements

5.1 Version requirement

The version of this document corresponds to the vM release of the TalkBox application which is to be submitted for the EECS 2311 midterm submission. You can check out the release here.

5.2 Deadline

The deadline for the first version of the project (EECS 2311 midterm submission) is February 24, 2019.