SOFTWARE REQUIREMENTS DOCUMENTATION

TBB Scenario Creator

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Purpose

The core purpose of this software is to facilitate Braille educators in an institutional environment. It aims to aid teachers to formulate, manufacture routines, called **Scenarios**, for a special piece of composed hardware to play on. This special hardware will then provide a medium for learners to engage in creative activities through user input and get relevant feedback from it, all designed by the educators.

Scenario Creation Features

This software delivers a wide range of features that facilitate Scenario creation such as:

1. Braille cell manipulation

The software includes commands to allow the user to directly interact with the Braille cells present on the hardware. The user can either set each pin on the cells individually or set an English alphabet on the cells in the Scenarios they create. Individual pins on the cells can be lower and raised by the user through commands in the Scenario.

2. Voice Commands

The software allows the user to write commands to order the hardware to speak text, ask questions, and provide auditory feedback based on the user's input. These voice commands can be triggered at any point in the Scenario's lifecycle as desired by the user.

3. Audio playback

The software allows the user to include audio in their Scenarios to deliver auditory feedback for the users. The user, through the software, has the freedom of either including existing audio files or record them on the spot.

4. Command Management

The software provides additional commands to manage other commands as well. The user can use these to repeat a set of commands at a point in the Scenario or skip certain commands entirely.

5. Lifecycle management

The software gives the user several tools to help manage the Scenario's lifecycle. These tools allow the user to pause the program, reset the Scenario and clear all Braille cells at moments the user sees most fit.

6. Scenario management

The software allows the user to quickly reopen and improve previously made Scenarios. The user can easily import existing Scenario files and edit them as they see fit. When the Scenario editing it done, it can be conveniently exported as a file by the user to be worked on later or to be simulated and played onto hardware.

Accessible interface

The software has a robust interface to facilitate an engaging experience for both normate users through an intuitive GUI, and for visually disabled users through screen reader support. The software gives the user contextual feedback through screen reader services to allow a hassle-free experience.

Multiple input options

The software is designed with ease of use in mind. Throughout the system, each feature has been studied thoroughly using action logging and usage tracking to understand how each one should be accessible to the user. Using this data, several ways of activating these features have been included in the software. The actions and features important to the users and that have a high frequency of usage have been equipped with keyboard shortcuts and keyboard combinations for quick execution. These features are equally accessible from the keyboard or the mouse.

Use cases

1. Educational tool

The software can be used to teach the Braille language to kids and illiterate people through creative activities and routines. These routines can be distributed and freely edited to improve their effectiveness and refine the experience. The software provides teachers with many tools to build very detailed Scenarios to be used in classrooms and helps craft new ways of learning that's more engaging to the learner.

Users

Educator: The teachers of the Braille language can benefit from this software and use it as a newer approach to teach the language. The hardware and software can provide fresh ideas and allow them to tailor unique routines for their students.

Students: The students using hardware programmed with this software can benefit from the increased response from their learning tools. Sensory enhancements from the hardware like voice output and mechanical Braille cells can increase their enthusiasm and engage greater learning experiences.

2. Auditory games

The software can be used to build intricate games that use Braille cells and audio playback to interact with the players. The games can have several Scenarios played conditionally according to the games rules to provide an engaging experience. The buttons can be used to take player input while playing the games.

Users

Game designers: The software allows designers to have control over a standard hardware interface through which they can build games for children and students.

Children: The software allows children to have access to unique hardware that they can use to play these games. It provides them with unique and accessible input controls and voice feedback components.

3. Daily News displays

The software can be used as a medium to deliver News and other daily info to users through daily updating Scenario files that periodically rotate between different topics to be displayed like Sports, Politics, Local and international News etc.

Users

News distributors: The software can allow distributors to design news experiences for the users in their unique way to present the content through voice and physical mediums. This can help to increase the availability of online content to visually impaired users and thus increase their audience.

News readers: This software can allow users to enjoy news content through a unique experience and allow them to interact with the content better.

4. Smart home device

The software can be used to control smart home appliances and even as a smart home device itself using Braille cells as a display and Scenarios triggered using available buttons.

Users

Developers: The software can extend the toolset of developers who create smart home devices. They can increase the accessibility of their services incredibly through custom made control and feedback mechanisms that run on accessible hardware.

Home owners: Consequently, the software can help visually impaired users to interact with their smart home devices more conveniently. It can make many devices and services accessible and help engage more users to adopt them.

Acceptance cases

1. Reusability

Feature: Importing and exporting scenarios

When the user makes a new Scenario using the Scenario editor, it is saved used an Export feature which converts the Scenario into a commands file for the hardware to read. However, the user can import this file and edit, delete, and modify the commands at will. This gives the user a freedom of continuously revising, editing, and previewing the Scenarios that are made.

Steps:

- ⇨ Open the software and select *Create New Scenario*
- ⇨ Build the Scenario by adding commands
- ⇨ When done, export the Scenario using *Export Scenario*
- ⇨ Preview the Scenario on the hardware
- ⇨ When revision of the Scenario is required, open the program, and select *Import Scenario*
- ⇨ The Scenario will be read from the file and opened in the Scenario Editor
- ⇨ Edit the Scenario as required
- ⇨ Repeat the above steps until the resulting Scenario is satisfactory

2. Robust accessibility

Feature: Screen reader support

The software has full support and usability for visually impaired users. Each element of the GUI is given proper names and descriptions that the user can listen to and use understand their purpose. This allows the user to have an unrestricted user experience.

Steps:

- ⇨ Open the software and select *Create New Scenario*
- ⇨ Hover over different elements of the GUI to trigger the screen reader
- ⇨ The screen reader will read the name and description provided by the software

- ⇨ As the mouse hovers over different elements and windows, the screen reader gives auditory feedback to the user

3. Command management

Feature: Command reordering and removal

The software allows the user to reorder and remove commands made previously. This helps the user edit the Scenario to better suit their needs or to fix mistakes and inconsistencies in their Scenarios.

Steps:

- ⇨ Open the software and select *Create New Scenario* ***OR*** *Import Scenario*
- ⇨ Select a command to be reordered/ removed from the commands list on the left
- ⇨ Use the controls on the right to move the selected command Up or Down, or remove it
- ⇨ The commands list will be updated to reflect the user's action

4. Input accessibility

Feature: Keyboard shortcuts

The software allows the user to execute most actions through multiple input types. All actions and features can be accessed using a mouse and screen reader to guide the user. But if the user is visually impaired and seeks an easier input method, they can also use a keyboard and use different key bindings to execute actions and functions in the software.

Steps:

- ⇨ Open the software and select *Create New Scenario* ***OR*** *Import Scenario*
- ⇨ Once the Scenario editor is open, the user can access functions and actions with keyboard bindings
- ⇨ This is applicable in multiple ways in the software, ranging from file manipulation to editing actions in Scenarios