

Simon Fraser University
CMPT 275: Software Engineering I

Requirements Document

Version: 2
November 6, 2017

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Revision Chart

Version	Description of Version	Date Completed
1.0	Draft	Oct. 18 th , 2017
1.1	Reviewed	Oct. 18 th , 2017
2.0	Corrected errors from Version 1.1	Nov 2 nd , 2017

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1 Introduction

1.1 Purpose

The purpose of this document is to specify the requirements of the iOS application “Prep”. It will first establish the purpose and intended audience of the app. It will also list all the functional and non-functional requirements, as well as example tutorials for the usage of the app. The glossary will provide precise definitions for all the technical terms used in this document.

1.2 Scope

Prep - Do not fear change, change fear!

Prep is an iOS application that is designed to aid autistic children in adapting to new environments and situations that the child will encounter in the near future. *Prep* systematically exposes children to stimuli that could be present in a specific environment or event, not only to normalize them to the stimuli but also offer them opportunities to learn proper responses and proper behaviour in these situations.

Prep will recreate an *experience* for the child, which is a sequential tour based on the targeted environment or event. In each step of the tour, there will be *triggers* for the child to interact with, the *trigger* will start a sound, video or an interactive activity.

Prep will come with premade *experiences*, but will also include an *experience* editor where parents and caretakers can create, customize and share *experiences*. They will be able to take pictures of a location, and *Prep* will render a 360° view of the environment. They will be able to highlight objects in the rendering as a *trigger* and select a sound, video or interactive activity to link with the object.

1.3 Intended Audience

The users of *Prep* will primarily be autistic children and their caretakers. Based on our research [1], [2], the majority of autistic children who suffers from anxiety problems are between 7 to 14 years old.

The caretakers will be responsible for introducing the app to the child, and to monitor the child’s usage of the app, as well as creating custom experiences for the child by using the Experience Editor. It is assumed that they have experience dealing with a child with autism, specifically introducing the child to the usage of technology, most importantly the iPad. The caretakers should have some experience with using an iPad. They should know how to take photos, videos and recordings, and basic app navigation.

The children will be the ones engaging with the experiences within the app. These children will be on the autistic spectrum, and may face a challenge navigating and operating the app. They are expected to have difficulty with some of the stimuli in the experiences and may have a negative reaction to them. They will only interact with the Experience Viewer screen.

2 Features/Function Requirements

2.1 Functional Requirements

2.1.1 Register/Login Page

Once the app has been opened, the user should be brought to a page that allows the user to log in using an existing account, or to create an account if the user does not have one. If the user has previously logged in, they will be brought to the home screen.

Function ID: F1

Function Description: If a user has registered, they are able to login into their account. Once a user has logged in, when reopening the app there is no need to login in again, unless they sign out.

Function ID: F2

Function Description: If a user has not registered, they are able to signup with their email and select a username and password to link with their account.

2.1.2 User Registration

Clicking on the “Register for an account” button should allow the user to create a new account for the app. The user must provide a username, an e-mail address, and a password.

Function ID: F3

Function Description: The user will provide their email, username and password to create an account. For the user to successfully register, they must pass the guidelines as outlined:

Username

The username must be between 4-16 characters long, and be unique to the user. If the username does not fit those criteria, the user will be sent an error message with the corresponding error message and be allowed to modify their username.

E-mail Address

Only one account per e-mail address is allowed. If the entered e-mail account is already associated with an existing Prep account, or if the domain name of the e-mail is not recognized, the user will be sent the corresponding error message and be allowed to modify their e-mail address.

Password

The password must be 8-16 characters long. If the entered password is invalid, the user will be sent an error message and be allowed to modify their password.

2.1.3 Home Page

Once logged in, the user should be able to see the premade experiences as well as any custom experiences that they have made in the past. The user should be allowed to swipe through the entries and choose their desired experience.

Function ID: F4

Function Description: The user should be able to navigate through the premade experiences that are linked to their account by swiping. Each experience should be presented in a widget that displays the title and description of the experience plus its first panorama.

Function ID: F5

Function Description: The user should be able to select which experience they want to edit or view by clicking on the corresponding buttons.

Function ID: F6

Function Description: The user should be able to select the option to add a new experience. This will bring them to the Experience Editor Start Page where they can start to add and edit panoramas.

Function ID: F7

Function Description: The user should be presented with the option to go to the settings page where they can change the app's settings or sign out. Swipe-only navigation is on by default. Turning this option off should disable swipe-only navigation and instead have the camera be controlled by the iPad motion controls.

2.1.4 Experience Viewer

Selecting on the play button of the premade experience will play the experience. An overlay located at the top of the experience will allow the user to exit out of that experience at any time.

Function ID: F8

Function Description: The user should be able to look around the panorama by swiping the screen or by using the iPad's motion controls, according to the option set in the Settings Page.

Function ID: F9

Function Description: The user should be able to exit the experience at any time by clicking the exit tab on the overlay. The overlay should be present at all times while viewing the experience.

Function ID: F10

Function Description: The sound, video and next panorama buttons must appear on their corresponding locations in the panorama. These buttons are represented by a speaker icon, a clapperboard icon, and an open-door icon respectively.

Function ID: F11

Function Description: The user can play the sound by pressing on the corresponding speaker icon. They should be able to play and pause the sound at any given instance by pressing on the icon again.

Function ID: F12

Function Description: The user should be able to play a video by pressing on the corresponding clapperboard icon. This will enable a full screen popup where the video will automatically begin. The user should be able play or pause the video at any given instance by pressing on the play/pause icon located at the bottom of the video. The user should also be able terminate and exit the popup by pressing on the back button located at the top left portion of the video. The user should also be able to navigate to specific points in the video by clicking and dragging the circle to the desired time on the timeline located at the top of the video. The play/pause button, the timeline, and the back button should automatically hide itself after 4 seconds. Pressing on any part of the video should display them again.

Function ID: F13

Function Description: The user should be able to navigate to the next panorama in the experience by pressing the corresponding open-door icon. There will be no transition animation.

Function ID: F14

Function Description: When navigating to the next panorama, if the user has not played all the sound and video clips of the current panorama, there will be an incomplete panorama warning, asking them if they want to finish the current panorama first before moving on to the next. Clicking on 'yes' will allow the user to remain in the current panorama. Clicking on 'no' will send the user to the next panorama.

Function ID: F15

Function Description: When the user finishes playing all the sound and video clips of the final panorama, they will be greeted by a congratulatory page that notifies them the completion of the experience. Acknowledging this notification will bring the users back to the Home Page.

2.1.5 Experience Editor Start Page

Clicking on the “+” button from the Home Page or clicking on the edit button of any custom experience will bring the user to the Experience Editor Start Page. The user is allowed a maximum of 10 custom experiences.

Function ID: F16

Function Description: The user can edit the title of the experience. The title must be 4-16 characters long and unique from the user’s current collection of experiences. All standard characters are allowed to be entered within this field. Spaces are included for the character count. If the title already exists, the user will be sent an error message and asked to modify the title. They may not leave this field blank. The default title will be “*experience #*” where # is the next available number that will make it a unique title.

Function ID: F17

Function Description: The user is allowed to enter a description for their experience. The description may be up to 128 characters. It can also be left blank. If the character limit has been reached, the user will not be allowed to enter any more characters. Spaces are included in the character count.

Function ID: F18

Function Description: The user should be able to navigate through the panoramas within an experience by swiping through the list. They are also able to delete, edit or view the panoramas by clicking on the respective buttons.

Function ID: F19

Function Description: The user should be able add a new Panorama. They should be able to choose between a previously captured panorama from the iPad Camera Roll, or take a new panorama themselves.

Function ID: F20

Function Description: When taking the panorama, the user should only need to press the capture button and move the iPad’s camera around, as the image starts to fill the panorama. The user should not have to stitch the panorama images themselves. Once finished, they should be asked if the photo is acceptable. Clicking ‘yes’ will lead them back to the Experience Editor Start Page. Clicking ‘no’ should delete the current panorama and allow the user to take a new panorama.

Function ID: F21

Function Description: The user should be able to delete an experience, but only from the Experience Editor Start Page and not the Home Page. Clicking on the delete button should send a warning message to the user, and should ask them to confirm the action. Clicking ‘yes’ will

delete all sound clips, video clips, panoramas, and all other elements associated with the experience, and send the user back to the Home Page. Clicking ‘no’ will return the user to the current Experience Editor Start Page.

Function ID: F22

Function Description: The user should be able to exit the Experience Editor. Clicking on the exit button should send the user back to the Home Page. The user should be prompted to save all changes before being sent back to the Home Page. Clicking ‘yes’ will save the experience. If no title has been entered, or if the title entered is invalid, the default title will be used. Clicking ‘no’ will discard all changes made to the experience.

2.1.6 Experience Editor

The user should be brought back to the Experience Editor Start Page once they have added a panorama, and choosing to edit a panorama should bring them to the Experience Editor. Here the user should be able to add, delete or move the interactive icons within the panorama.

Function ID: F23

Function Description: The user should be able to navigate through the panorama. They should be able to swipe the screen or move the iPad in order to view different parts of the panorama. The user will have the ability to disable the iPad’s motion controls and opt for a swipe-only navigation in the app settings page.

Function ID: F24

Function Description: The user should be able to add sounds, videos and a next panorama button to the current panorama. Adding either of the 3 will create a button with the corresponding image (speaker, clapperboard, and open door icons respectively). The user should be able to resize, delete, or drag these icons around the panorama.

Function ID: F25

Function Description: If the user chooses to add a sound or video to the panorama, they will be presented with the option to use a previously captured recording from the local iPad library, or record a new sound or video. A speaker or clapperboard icon will be generated for the sound or video in which the user can then resize, delete, or drag around the panorama.

Function ID: F26

Function Description: If the user chooses to add a next panorama button, they will be asked which of the panorama is next. The next panorama has to already have been added to experience. An open door icon will be generated for the next panorama in which the user can then resize, delete, or drag around the panorama.

Function ID: F27

Function Description: The user should be able to move, resize and delete already-added icons in the panorama. They will also have the ability to preview the sound or video.

Function ID: F28

Function Description: The user should be able to exit the Experience Editor at any time. The user will be asked if they want to save the changes made or discard the changes. They will then be brought back to the Experience Editor Start Page.

2.2 Non-functional Requirements

2.2.1 Accessibility

The features of the app should be simple and easy to use, especially on the side of the child. Being on the autistic spectrum, navigation and use of the app should be intuitive.

Requirement ID: REQ1

Function Description: All buttons must have a universal symbol attached to it that reflects its purpose. It must also have a text label that represent what it does.

Requirement ID: REQ2

Function Description: The app's user interface will not contain any blinking or flashing elements. Any pre-packaged sound and video bits must have a volume averaging at 40 decibels and no more than 50 decibels.

2.2.2 Performance Requirements

Requirement ID: REQ3

Function Description: All screen transitions except transitions to the Experience Viewer and Experience Editor will take at most 2 seconds. Transitions to the Experience Viewer and Experience Editor will take at most 4 seconds.

Requirement ID: REQ4

Function Description: Taking the panorama must be seamless, there should be minimal lag as the user moves the iPad camera around to complete the panorama.

Requirement ID: REQ5

Function Description: After pressing an icon to play the sound or video in the experience, it should take ½ a second for the sound and 1 second for the video to start playing.

Requirement ID: REQ6

Function Description: While playing a sound and video it should take ½ a second to pause the recording.

Requirement ID: REQ7

Function Description: At download, the standalone app should take at most 40 MB of space.

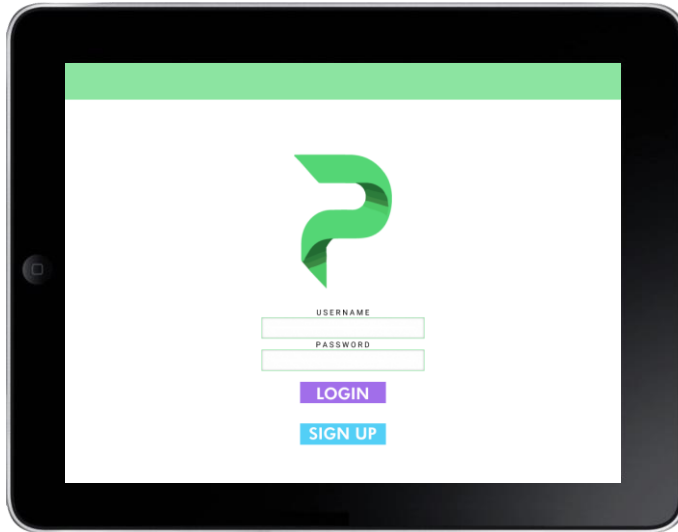
2.2.3 Hardware Requirements

Requirement ID: REQ8

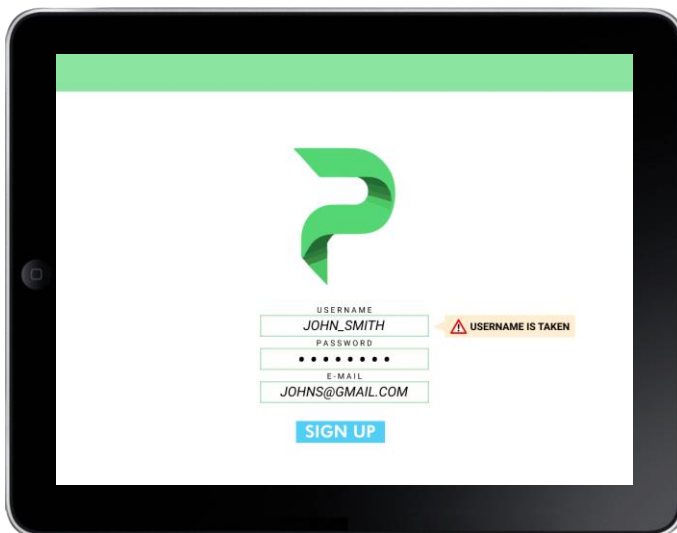
Function Description: The application must run on iOS11 on the iPad (2017) and iPad Pro 9.7 (1st Generation).

3 Example Tutorials

3.1 Sign Up for a new account

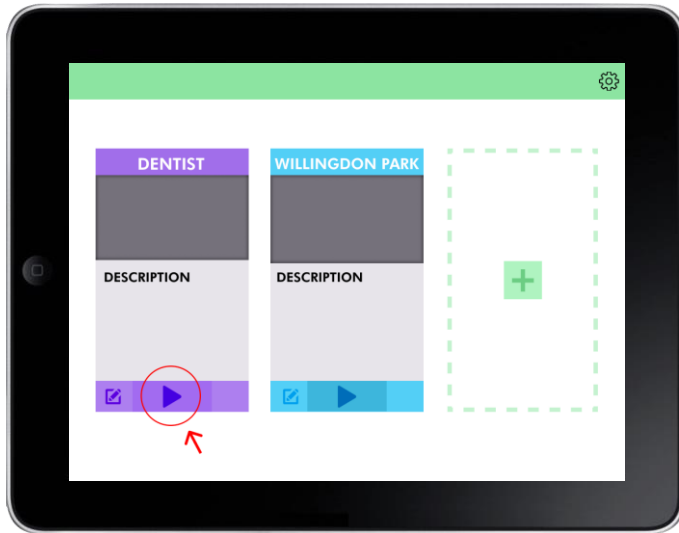


1. Ensure that access to the Internet is available.
2. Launch app.
3. Click Sign Up

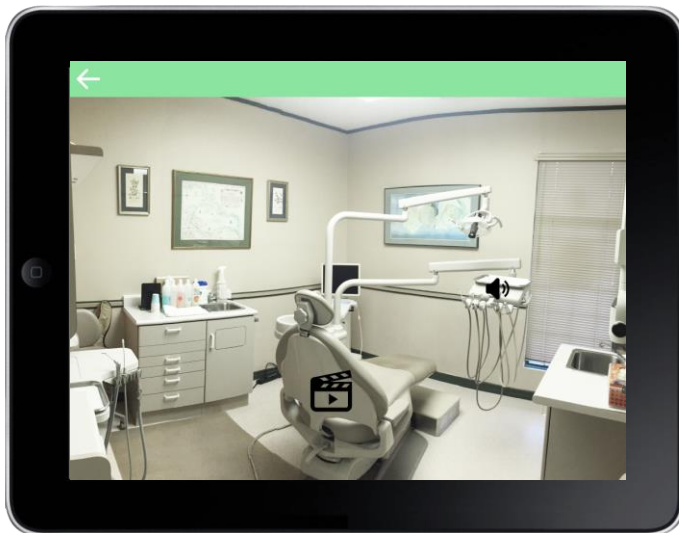


4. Enter username, e-mail, and password for the new account. Errors will appear for invalid credentials.
5. Click Sign Up.

3.2 Playing an experience

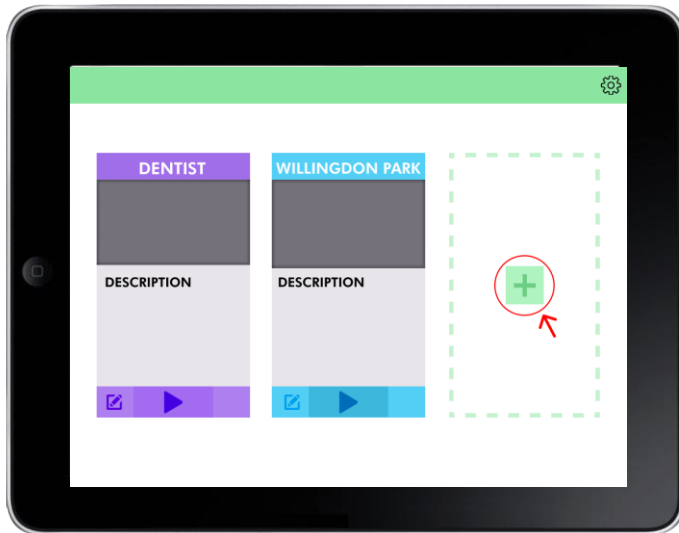


1. Select an experience.
2. Click the play icon.

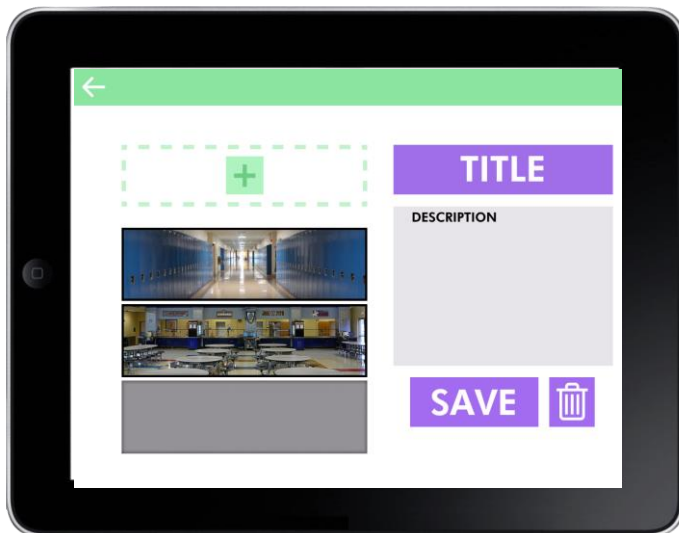


3. Depending on what you set, you can either swipe or turn the iPad to rotate the camera.
4. Click on the icons to play a sound or video of the corresponding element.

3.3 Creating an Experience



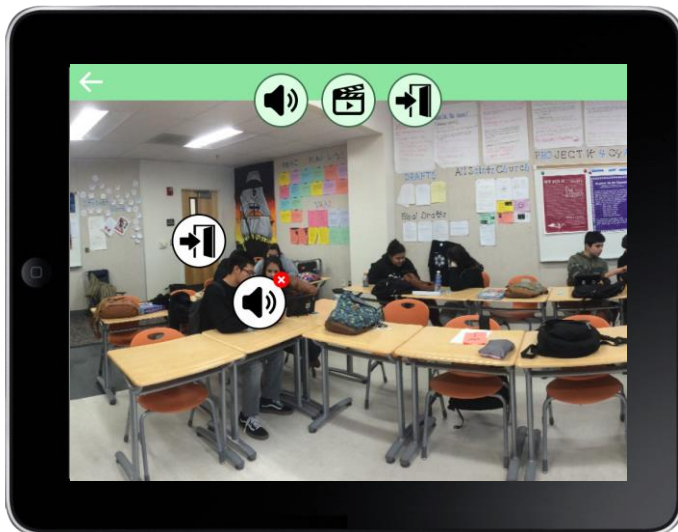
1. Click the “+” icon from the Home Page.



2. Enter a unique title for your experience.
3. Enter an optional description for your experience.
4. Click the “+” icon to add a new panorama.
5. Select a panorama photo from Camera Roll or take a panorama picture.



6. Choose between inserting audio, video, or a link to another panorama.
7. Selecting audio or video will allow you to either obtain an audio/video clip from your iPad or take an audio/video clip.
8. Selecting the door will allow you to choose a panorama to link.



9. Swipe to rotate the camera.
10. Drag and drop the elements into the panorama.
11. Go back and click “save” to save your experience.

4 Glossary

Term	Definition
App	The mobile application “Prep”.
Experience	A collection of panoramas that resembles a particular scenario (such as visiting a dentist).
iOS	An operating system used in Apple devices.
Motion Control	Refers to the action of moving the iPad around to control the camera rotation within the Experience Viewer.
Panorama	A photo that exhibits the complete 360° view of a location from a single standpoint. This panorama will have interactive elements such as sound and video once completed.
Swipe-only navigation	The rotation of the camera within the Experience Viewer is controlled by swiping the screen.
User	The person who uses the application.

5 References

- [1] E. Rotheram-Fuller and L. MacMullen, "Cognitive-behavioral therapy for children with autism spectrum disorders," *Psychology in the Schools*, vol. 48, Issue 3, p. 263-271, March 2011. [Online]. Available: Online Library, <http://onlinelibrary.wiley.com/doi/10.1002/pits.20552/full>. [Accessed Nov 2, 2017]
- [2] E. Simonoff, A. Pickles, T. Charman, S. Chandler, T. Loucas and G. Baird, "Psychiatric Disorders in Children With Autism Spectrum Disorders: Prevalence, Comorbidity, and Associated Factors in a Population-Derived Sample," *Elsevier*, vol. 47, Issue 8, p. 921-929, August 2008. [Online]. Available: ScienceDirect, <http://www.sciencedirect.com/science/article/pii/S0890856708600593?via%3Dihub>. [Accessed Nov 2, 2017]