Deliverable G: Prototype 2 and Customer Feedback

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March 13, 2022

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1. Introduction

Prototyping is a key part of anything that needs a design. It allowed us to have different ideas and solidify them. It helped us figure out what worked, what didn't work, and what might work while making sure that what was required was still there. In this deliverable we will be presenting how our team has been able to make alterations to our first prototype and test plan. As well as how we developed it to help us achieve our goals.

2. Prototype 1 Feedback

The focus of Prototype 1 was to see how our storyboard concept would translate into an immersive format. To ensure that our design is conducive to teaching empathy to the user we made a video that portrays our scenario and the possible responses the user will eventually choose in the interactive VR simulation. The video flows through our concept and shows where the switch in points of view would occur.

As part of our prototyping for Prototype 1, we had 7 University of Ottawa students (4 females, 3 males) watch our video and answer a series of short answer and long answer questions in an anonymous google form. There were 4 questions which had a choice of 5 responses from strongly agree to strongly disagree, as well as 2 long form questions which asked for any other comments/observations and suggestions for improvement. The 4 questions with the scale of agreement response were focused on the 4 test objectives (scenario communication, story communication, script communication, empathy communication). Overall, our survey results demonstrated that our scenario, script and empathy communication aspects are quite strong. The users found some trouble with the switch between points of view and how that fit into the overall storyline. When we implement the switch between points of view we will ensure that it is clear and easy for the user to understand.

At the client meeting on Monday March 7th, we had the opportunity to share our ideas for the project as well as our prototype with the client, panel members, peers and Professor Foster. Due to the time constraints of the presentation, we were unable to fit playing the whole video of our prototype in the presentation, but we managed to present an overview of our design concept and process.

A suggestion received from one of the panelists was to include a bystander in the scenario. This inclusion of a bystander would be an interesting dynamic to explore, as the bystander would witness the interaction between the two characters in which there is discrimination on the basis of gender. The bystander would be unable to ignore this situation and it unfolds in an elevator. Having a bystander experience the scenario in this confined space would likely be effective in teaching empathy. Our team would like to explore this if we have sufficient time, however, we would like to focus on creating our interactive scenario with the 2 characters before adding in a bystander.

The feedback received from our peers indicated that we could improve our presentation by spending more time explaining our actual concept and prototype, rather than our process. In our next presentation, we will focus on explaining our concept and ensure that our concept is clearly communicated.

3. Analysis of Critical Components

This prototype focuses on specific critical components such as elevator functionality, elevator aesthetics, button code, and scene switching with buttons. The elevator functionality includes whether the elevator can be inputted and used in Unity with a virtual reality (VR) headset. The elevator aesthetics include whether the elevator looks like an elevator and conveys the scene appropriately. The button code is the code that will be used to ensure that the buttons properly switch from scene to scene. Finally, the scene switching with buttons refers to the actual functionality of the buttons when playing the game with a VR headset.
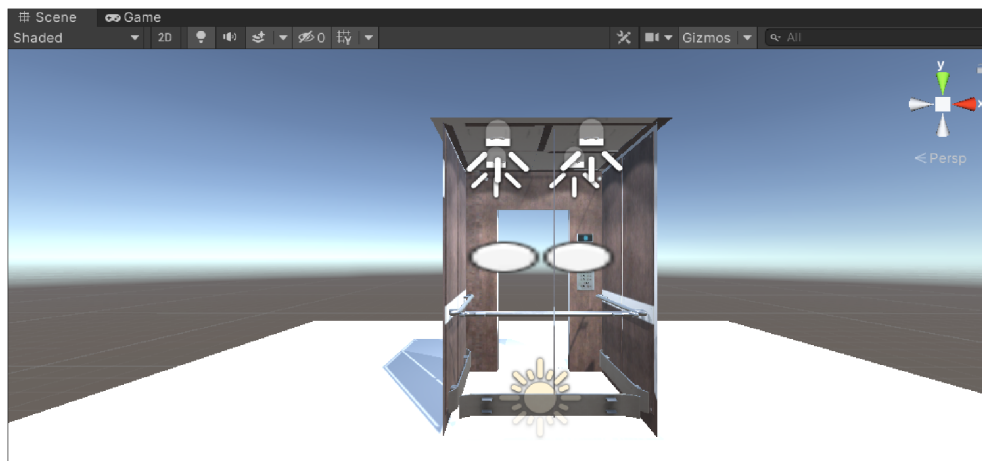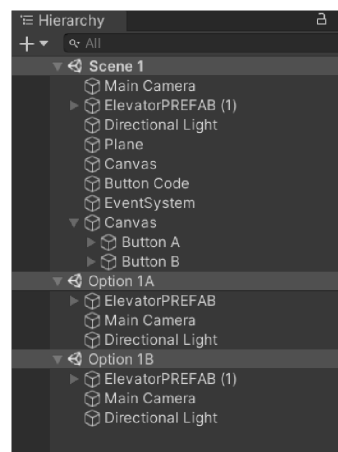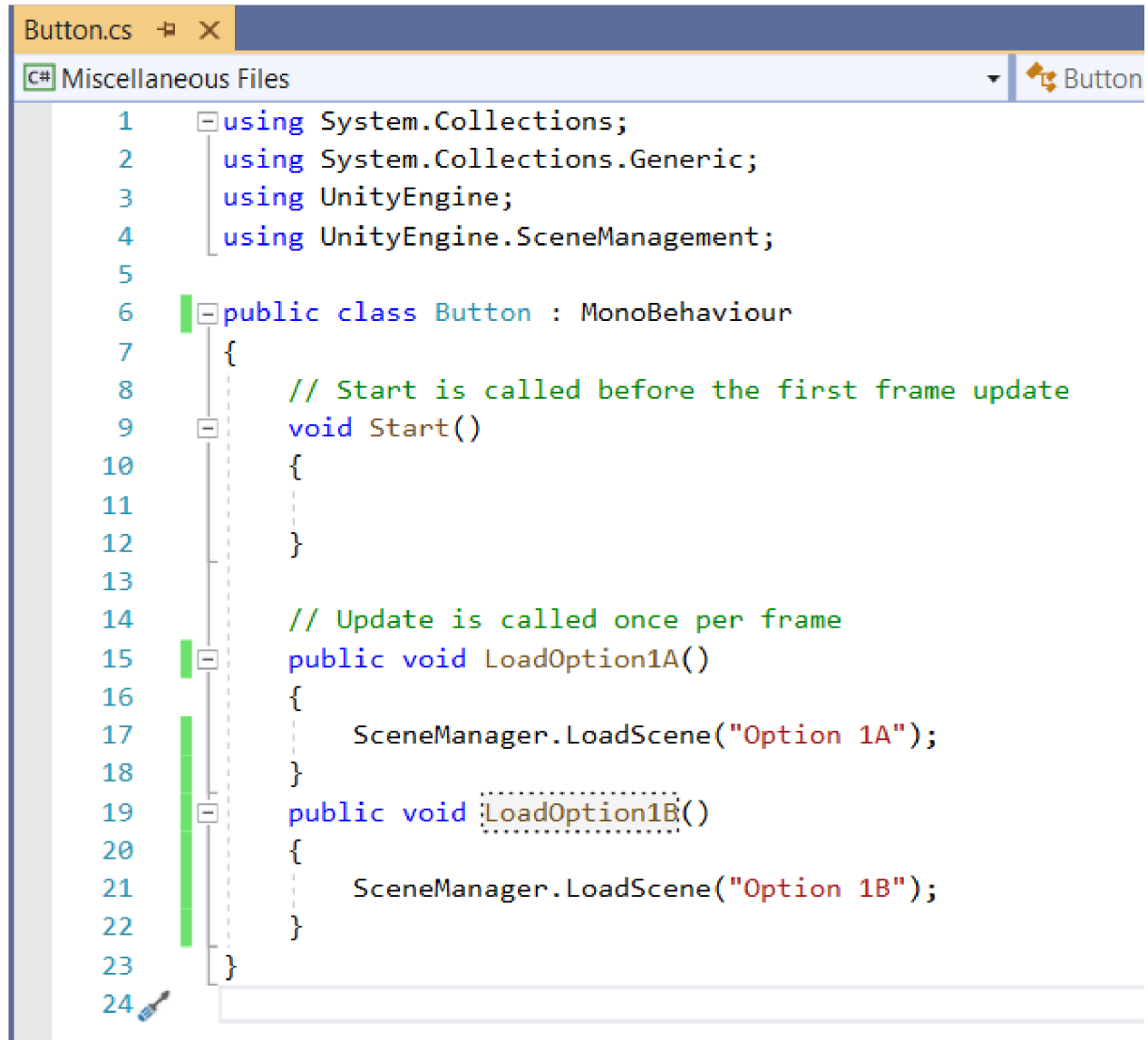

Figure 1. Elevator Asset Including Buttons in Unity

Figure 2. First 3 Unity Scenes

```
Button.cs  ⌷ ✕
C# Miscellaneous Files                                              ▼  ⚡ Button
     1      using System.Collections;
     2       using System.Collections.Generic;
     3       using UnityEngine;
     4       using UnityEngine.SceneManagement;
     5
     6      public class Button : MonoBehaviour
     7      {
     8          // Start is called before the first frame update
     9          void Start()
    10          {
    11
    12          }
    13
    14          // Update is called once per frame
    15          public void LoadOption1A()
    16          {
    17              SceneManager.LoadScene("Option 1A");
    18          }
    19          public void LoadOption1B()
    20          {
    21              SceneManager.LoadScene("Option 1B");
    22          }
    23      }
    24
```
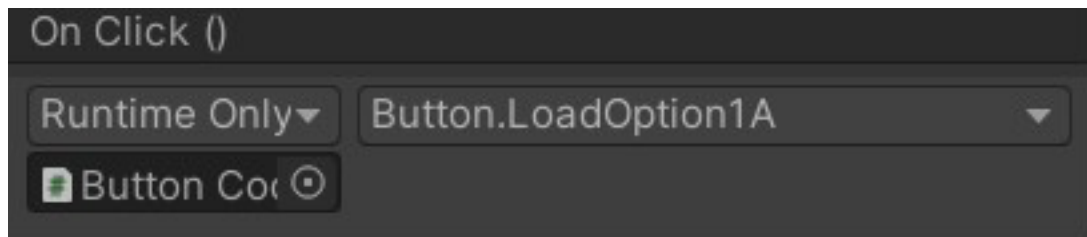
Figure 3. Button Code

```
On Click ()

Runtime Only▾   Button.LoadOption1A          ▾
⊟ Button Co ⊙
```

Figure 4. Implementation of Button Code

4. Prototype 2 Test Plan and Target Specifications

Table 1. Prototype Test Plan 2

Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method (What)	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (What)
1	Test elevator Functionality to ensure it is useable in Unity	Using VR headset, walk around elevator and ensure that it functions	Is it possible to move around the elevator using a VR headset? Results: YES/NO Impact: If it is not possible to move around the elevator, a new asset must be purchased	1 hour expected duration March 10th
2	Is the elevator aesthetically pleasing for the user	Using a VR headset, walk around the elevator and ensure that it looks like an elevator and accurately conveys elevator setting.	Does the elevator asset convey the setting accurately? Results: YES/NO Impact: If the avatar does not convey setting, new elevator must be chosen	30 minute expected duration March 10th

3	Does the code for button scene switching run?	Run code and ensure that there are no errors.	Does the code run? Results: YES/NO Impact: If code does not run it must be debugged and tried again.	1 hour expected duration Start March 10th
4	Test elevator scene switching with buttons in to allow for user to select speech options	Using VR headset, press on button and see if scene changes properly.	Does the scene change to the desired scene without error? Results: YES/NO Impact: Scene must be reviewed and retried if it does not change correctly.	2 hour expectation Start March 10th

Table 2. Updated Prototype 2 Target Specifications

Criteria	Measurement	Wanted Value	Acceptable Range
Elevator Functionality	Yes/No	Yes	Yes
Setting Communication	Good/Okay/Bad	Good	Okay
Code Functionality	Yes/No	Yes	Yes
Button Functionality	Yes/No	Yes	Yes

5. Test Analysis and Results

5.1 Elevator Functionality

The elevator functionality within Unity was tested by the team using a VR headset. The elevator was simply imported into Unity and the VR headset was attached to the Unity game using Steam software with a player asset. Team members determined that the elevator was functional while using a VR headset, falling within the "Yes" wanted and acceptable range. One identified issue was that when the elevator was made rigid to prohibit users from moving the elevator, the elevator doors began to move due to the animation setting they already have, which was unwanted. For the next prototype this issue will be resolved through more asset testing, however our team has determined that this is a small and surmountable issue.

5.2 Setting Communication

While determining elevator functionality, team members also noted the setting communication of the elevator. It was determined that this setting communication was good, falling within the wanted range. The elevator is extremely detailed and team members are confident that it will provide the users an immersive experience.

5.3 Code Functionality

Code was implemented (Figure 3) to allow for scene changes when users press a button. Using Unity Engine Scene Management functions button code was applied to the game with no error pop-ups, falling within the wanted range for this part of the prototype. Using Various load button options scene allows user to choose the dialogue they would like to see from the game by pressing a button, and this button will lead the user to the desired next scene (Figure 4).

5.4 Button Functionality

Through the use of a similar button for original testing the code (Figure 3) was applied to a button and was found to lead the user to the next desired scene with no error when using a VR headset and pressing on the button with their hand. This falls between the wanted value, although the original button was found to be too bulky for the game aesthetics so new buttons (Figure 1) were applied to allow for a more aesthetically pleasing user experience.

5.5 Overall Results

The elevator was found to effectively function within Unity software to create an immersive user experience. By using the buttons, users will be able to choose the dialogue of the character and will be led to the corresponding response scene. From here, the team will be able to implement avatars and dialogue to finish the user experience. The so called "bare-bones" structure of the game is effectively laid out

6. Prototype 3 Test Plan

Table 3 Prototype 3 Test Plan

Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method (What)	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (What)
1	Verify that avatar expression and movement functionality work properly	The test shall be carried out using Unity software. Here we would check the degree of responsiveness of the avatar to each scene, that is, how the avatar displays or changes expression.	accuracy of the avatar movements and expression? Results: YES/NO Impact:If the objectives are not attained, more testing must be done to fix this error.	3 hour expected duration Start March 15 th
2	Check the introductions of dialogue to see if they match each scene.	In the Unity software, we would implement dialogue between the avatars. Here we would test the explicitness and accuracy of the dialogue during each scene. .	Is the dialogue explicit and those correspond to each scene? Results: YES/NO Impact:If the dialogue isn't explicit, more testing and modification must be done to fix and ameliorate it.	2 hour expected duration Start March 17th
3	Evaluate the level of empathy derived from the overall prototype.	Since it is our last prototype, each member of our team would go through this prototype to check on the level of empathy derived.	Is empathy felt from the overall prototype? Results: YES/NO Impact: If no empathy is felt, more testing and modification would be carried out to ameliorate the overall protype.	1 hour expectation Start March 18th

7. Conclusion

   Prototype II is made to visualize the first part of our project, the elevator. It's a significant part of our project and would like to make sure that our client is satisfied. The primary goal of the project is to be able to deliver what the client had asked for. We will make sure of that by sticking to our ideas and doing the best of our abilities. With the unity model we have it will show the elevator and how the lighting is and the size. Taking everything into account the assets helped us visualize more how the game will end up looking in the end. In conclusion the modified prototype helped us detect problems earlier and helped us deal with them before it was too late. We also know what the clients want and that will help us to make it even better.