Deliverable F- Prototype I and Customer Feedback

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1. Introduction

After receiving feedback from our client on the initial concept, our design and plan has been appropriately adjusted. This document contains the main customer feedback from the client meetings, as well as an outline of our initial prototype and its timeline. The outline will include an analysis of the project's critical components, a prototyping test plan that includes a description of each subsystem and it's metric, as well as a section recording feedback and comments on our current outline.

2. Customer Feedback

When talking to our client, the main ideas that they suggested were that; we should have one main idea that we should stick to, and that we should ensure that we're including a way to encourage empathy in the user.

Since we already had a pretty solid idea for what to focus on for our project, we decided to stick with the idea of making a game based around traveling in a wheelchair. The client heavily emphasized that we should focus on making the experience empathetic for the user, and to do that we're thinking of including game mechanics that make it more difficult for the user to get around, making the experience more similar to that of someone who's actually in a wheelchair. These mechanic ideas include: a stamina bar so that the player can only stand up for a short period of time, having to move the wheels with your arms to be able to get around, and rolling backwards when going up a sloped area if you aren't constantly moving.

3. Outline for Prototype I

3.1. Critical Components

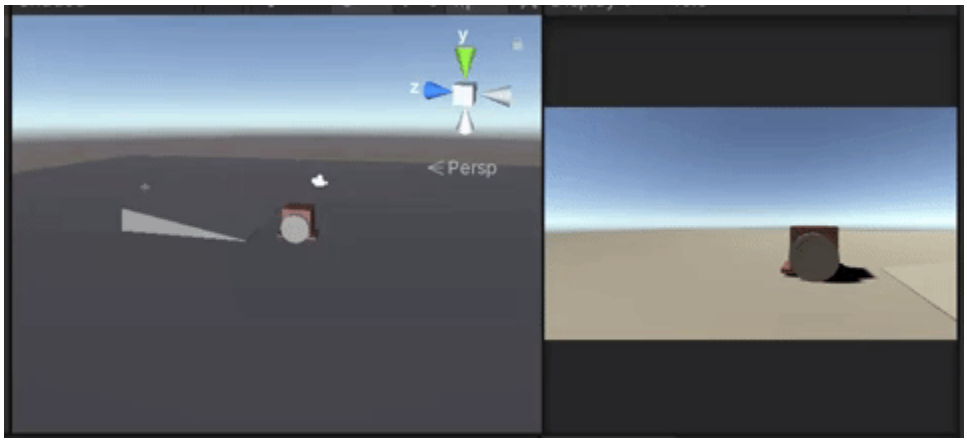
- Wheelchair Motion
    - The user must be able to move throughout the gameworld by moving a wheelchair. The wheelchair must resemble the locomotion of an actual wheelchair.
- User Input Through VR Controllers
    - The user should be able to give input torque to the wheels of the wheelchair by using the VR controllers. The sser should also be able interact with elements of the gameworld such as items, doors, and railings.
- Empathetic Level Design
    - The level design should highlight the difference between wheelchair mobility and non-disabled mobility. The levels should include wheelchair ramps, elevators, and obstacles for the user to navigate. Potentially, non-disabled NPCs can traverse the level to contrast the difference in movement.

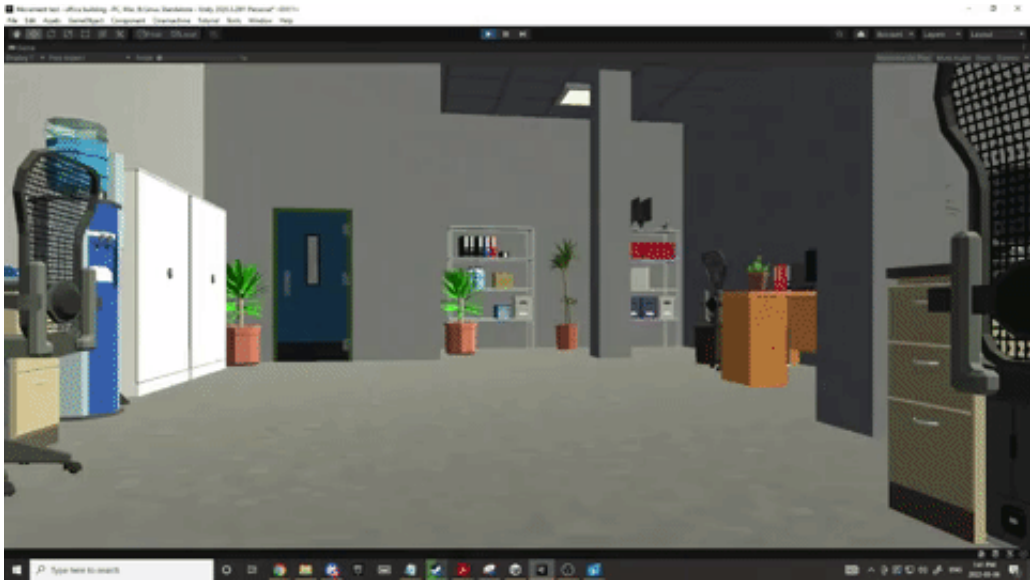
3.2. Prototyping Test Plan

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 (When)	Analysis of results
1	Wheelchair motion fidelity	Create an object in unity that has two wheels and moves in a manner similar to a wheelchair	Does the object *feel* and look like how a wheelchair moves? The greater the verisimilitude the better	March 6 - March 29	Restore the appearance of the wheelchair in reality
2	Wheelchair Input fidelity	Create a mechanic that allows for the user to give a torque input to the wheelchair wheels. Mechanic must be intuitive and immersive	Does this mechanic make you feel like you are turning the wheels on a wheelchair? Does the motion of turning the wheel mimic that of an actual wheelchair? Does this motion engage or distract from user immersion?	March 6 - March 29	Simulate how a wheelchair is used in real life.
3	Design office building	Create an office building that can be used to navigate through by the player	Will a player be able to navigate through it? Does it fit our needs ex. Include elevator.	March 6 - March 29	The building is able to navigate through with an included elevator
4	Movement in the office building	Create a player that will be able to move around in the office building with keyboard inputs	Will the player be able to move around in the office building and open doors	March 6 - March 29	The player is able to move around the office building with keyboard inputs and
5	Movement	Create AIs that can	AI can follow	This is a	NPCs can

	of NPCs	move around in the game. Multiple AIs can move at same time	pre-designed routes. AI has different walking speeds and behaviors	temporary concept and may not be completed	walk around to create a more realistic scene
6	NPCs' interaction	Create 1-2 special NPCs that players can press the designated button on to trigger a dialogue. Some NPCs can activate the dialogue automatically when the player moves to a certain area.	NPC can give you correct dialogue, information. These NPCs can be triggered by pressing a button to talk to him, or automatically when you move to a certain area	This is a temporary concept and may not be completed	Increase the interactivity of the game
7	Feeling Empathy	The game allow users to experience and understand the difficulties of disabled people in real life, thereby generating empathy	Since there's not really a set way of measuring this, we're going by whether the user feels empathetic or not	March 6 - March 29	This game can generate empathy and accomplish the goal

3.3. Prototype I





For the first prototype, our team has successfully managed to create a prototype for wheelchair movement, as well as navigating/interacting with virtual environments. The wheelchair operates using Unity's built-in Wheel Collider. Both wheels can receive independent inputs, and as such its movement can replicate the locomotion of a wheelchair. As for the office, this proves that our team now has the capability to create and navigate and interact with a virtual environment, and the work can begin on level design.

3.4. Feedback/Comments

For the wheelchair movement prototype, it does not mimic the movement of a wheelchair to a satisfactory degree. The wheelchair can move well across flat surfaces, however a glitch arises when the wheelchair corners too sharply or tries to go up a ramp. When this happens, the wheelchair will fall forward and begin to slowly tumble forward in a very unnatural way. This tumbling resembles the object rotating along the axis of the wheels, and it will continue to tumble up the ramp or along the surface of the plane without end.

For the movement in the office prototype, the design runs pretty smoothly with only minor bugs. Some of the bugs include being able to see through walls if your camera is oriented in a certain direction and not being able to use the elevator. Another challenge we have to implement is how we will implement this into VR as right now it only takes keyboard and mouse inputs.

4. Cost Analysis and BoM

https://docs.google.com/spreadsheets/d/1NflAsQwuT3x9zMJBFYiOgJBIJY7C40MbRLy4APj96b4/edit?usp=sharing

5. Conclusion

In conclusion, our team now has a clear idea for the direction of this project after receiving feedback from our client and users. We will pay attention to creating a game that focuses on the user experiencing empathy through playing as someone who moves around in a wheelchair. Between now and our next prototype, we will be continuing to refine our in game mechanics, and we will hope to have completed a level design as well as a wheelchair that interacts as intended.

6. Wrike

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=iZvwpGNvIR3wmEj7lC3ya1OIlqwr1goz%7CIE2DSNZVHA2DELSTGIYA