Deliverable G - Prototype II and Customer Feedback

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1. Introduction

After receiving the feedback from the client meeting on the first prototype, we have more detailed requirements and clear understanding based on our original ideas. For improving our project, our design and plan need to be adjusted again. This deliverable contains the main customer feedback from the first prototype meeting, as well as a table that shows some changes based on our prototype I. The table will include what we need to improve and abandon, as well as to show our latest plan for this project.

2. Feedback

The client agreed with our proposal, i.e. by showing the inconvenience of wheelchairs in daily life to let users increase their empathy. The client emphasized the game should be serious, which needs to be guarded against any factors that might make this game informal.

Since customers agree with our approach to increasing user empathy. On the other hand, we will add NPCs with no physical barriers, these NPCs can easily walk up the stairs, which creates a clear contrast with the player. Therefore, we need to keep our prototype 1 solution and add other factors on this basis to allow users to increase empathy.

3. Outline for prototype II

3.1. Critical Components

- 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.

- Movement of wheelchair

The user must be able to move throughout the gameworld by moving a wheelchair. The wheelchair must resemble the locomotion of an actual wheelchair.

- 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. Status of our initial prototype

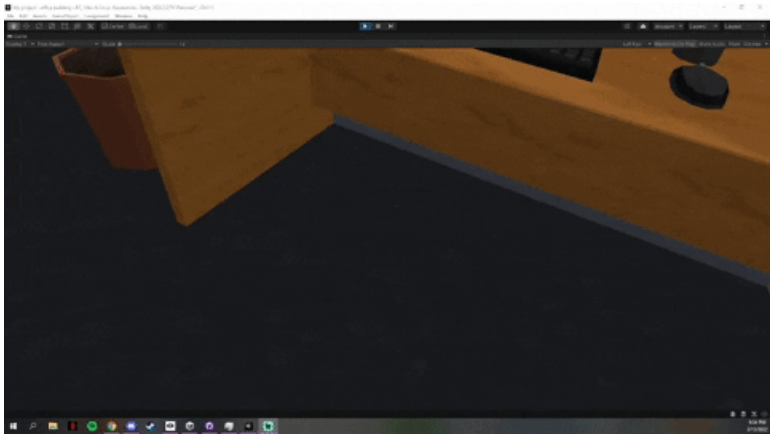
Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method (What)	Description of Results to be Recorded and how these results will be used (How)	status	Estimated Test duration and planned start date (When)	Analysis of results

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	processing	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?	processing	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.	processing	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	processing	March 6 - March 29	The player is able to move around the office building with keyboard inputs and
5	Movement of NPCs	Create AIs that can move around in the game. Multiple AIs can move at	AI can follow pre-designed routes. AI has different walking speeds and behaviors	processing	This is a temporary concept and may not be completed	NPCs can walk around to create a more realistic

		same time				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	abandoned	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	processing	March 6 - March 29	This game can generate empathy and accomplish the goal
8 additional	factor checking	Checking if there are some aspects of the game that are inappropriate, such as difficulty being too easy, or factors that make it difficult for players to empathize	Checking the game make sure the game has reasonable difficulty to help players generating empathy	processing	Before March 31	The difficulty of the game is reasonable and can let users generate empathy

3.3.Prototype II

For the second prototype, our team successfully created a game interface that can be run through a VR system, i.e, players can use a VR controller to interact with pre-set programs, even though this game's interface is very simple right now. After that, we will put the office and NPC into the map under the condition of confirming the basic game performance, i.e, to ensure that the wheelchair can operate normally in the game. At least for now, our team has the ability to create and navigate and interact with virtual environments.



3.4 Level Design

For level design, we're working on slightly modifying the office building that we currently have. There are 3 different obstacles we hope to implement, which are a ramp that will either have a very high friction coefficient or a very low coefficient, a long corridor with a small width and NPCs walking through it, and a staircase which either requires the player to climb up it or avoid it completely and find an alternate route to higher floors.

For the ramp level, the goal is to make it seem as if the player is really slow and has to take a lot of time to do something that would normally take almost no time. This will be accomplished through the length of the ramp, along with the inclusion of NPCs walking up the stairs beside the user to hopefully make the user frustrated that they cant use the stairs. For the corridor level we're planning on making the width of it around the size of the wheelchair, and we're going to have NPCs walking through the hallway to prevent the user from going through it until they're all gone. For the stair level, we're either going to implement a stamina meter and have the user walk up the stairs while someone brings up their wheelchair for them, or have them find an alternate route up to the next floor. This one is probably the most difficult level to create so there's a chance that this idea will get scrapped due to lack of time.

3.5. Feedback/Comments

Currently, we are just starting to develop games in the context of VR operating systems, and most items (e.g. wheelchairs, buildings) are not yet ready for VR, or need improvement.

For the wheelchair, how to control the wheelchair through the VR handle and make it move like in real life is a challenge for us. Since the operation of the keyboard and mouse is different from that of the keyboard and mouse, the user needs to move the handle to move the wheelchair as in reality. Overall, how to design the movement method is a difficult problem.

For NPCs, how to improve NPCs and make them more reliable is a problem. Right now, our NPCs only can move with pre-set programs, and they can go across the wall and stairs in the building. To overcome this problem, we need to pre-design their walk routes and set appropriate stop and repeat times for their movements.

4. Cost Analysis and BoM

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

5. Conclusion

In conclusion, after receiving feedback from customers and users, our team now has a clearer idea of the direction of this project. We're going to focus on creating empathy for the player by acting as a person walking around in a wheelchair and adding other factors on top of that (like adding NPCs without physical disabilities or adjusting the friction of the ground/ creating steep slopes to make wheelchair use more difficult). From now until our final product, we will continue to refine our game mechanics to make them work flawlessly in VR. We want to finish the scene setup and deliver our results as expected.