PRODUCT PLAN

INTERACTIVITY IN VIRTUAL SPACE

MAY 4, 2016

CONDEXT
TUDelft

Contents

Introduction

This product plan is written in the context of a project that is scheduled for the last quarter of the second year for computer science students. Besides the Delft University of technology, this project is conducted with collaboration of CleVR, a company that specializes in software solutions with virtual reality. CLeVR is currently building a product that therapists can use during the treatment of psychosis. Our goal for this project is to let a future user, which in this case is the client, be able to interact with the virtual reality using several hardware tools.

The purpose of this document is to provide guidelines for the seven weeks that follow after writing this. All the sub-parts of the final product are listed in the product backlog. The planning for each week has been outlined in the product roadmap and the initial requirements are also documented. However, additional requirements could arise during the development.

MoSCoW

Functional

Must Haves

Essential features required for a successful product.

- The user must be able to see his whole virtual body within the virtual world
- The user must be able to move his virtual body by moving his real body with the use of the Kinect.
- The user must be able to move his fingers separately using the provided tracking hardware: Manus VR and Leap Motion.
- The user must be able to pick up items using a grabbing gesture with his hands.
- The virtual body must behave in a physically possible way, avoiding unnatural bending, and not distressing the user.

Should Haves

Features that greatly improve the quality of the product but aren't essential.

- The user's virtual body should not clip through objects in the virtual world.
- Virtual items should not clip through objects in the virtual world.
- The user should be able to put grocery items in a shopping cart or basket.

Could Haves

Non-essential features that are only implemented if there is enough time

- The body of the user could be represented by a realistic looking 3D model.
- The user could move around in the virtual world with a controller
- The user could interact with objects in another way than picking up, like pushing.

Won't Haves

Interesting features for future development that are not going to be implemented

- The user won't be able to move around in the virtual world using a VR walking pad like the Virtuix Omni
- The hands will not get tracked when outside the vision of the leap motion (in front of the player)

Non-functional

- The project must be developed on Unity3D.
- Classes must be unit tested when not hardware related.
- The framerate must stay around or above 90 fps.
- The final product should be finished before June 23, 2016, 18:55

Roadmap

Sprint 1

- Set up GitHub repo, google drive and other platforms necessary.
- Product Vision draft finished
- Product Plan draft finished
- Architecture Design draft finished

Sprint 2

- Setup Unity3D environment and project
- Product Vision finished
- Product Plan finished
- Project Skills assignment 1 finished

Sprint 3

- Simple Unity3D environment (map) created and tested, does not contain any objects other than the player itself.
- Basic visualization of hands implemented (just a skeleton, not a textured 3d model)
- Hand tracking and finger tracking with Leap Motion implemented
- Demo of Unity3D environment and hand tracking.

Sprint 4

- Basic visual model of body finished (just a skeleton, not a textured 3d model)
- Integrate Kinect software and link the input to limb movement
- Demo of limb movement using Kinect

Sprint 5

- Integrate Manus VR finger tracking
- Combine Manus VR finger tracking with the Leap Motion
- Demo of finger and hand movement with Manus VR

Sprint 6

- Interaction with world implemented (physics)
- Improve the existing Unity3D map to represent a virtual supermarket
- Demo of interaction with the virtual supermarket (picking up items)

Sprint 7

- Improvements on previously built functionalities
- Testing with VR headset.
- Implement input filters (if hardware loses connection or delivers strange input, solve this in a visually realistic way)
- Demo of the whole system (environment, virtual body, hand and finger movement and all other added functionalities)

Sprint 8

- Improvements and bugfixes
- Architecture Design finalized
- Final Product

Sprint 9

- Interaction Design Quiz (individual)
- Final Report

Product Backlog

TASK OR FEATURE	DUE AT SPRINT	DONE IN SPRINT
HIGH PRIORITY		
BASIC UNITY3D ENVIRONMENT (EMPTY ROOM WITH ITEM SHELF)	3	
HAND TRACKING AND FINGER TRACKING WITH LEAP MOTION	3	
BASIC BODY MODEL	4	
INTEGRATE KINECT SOFTWARE	4	
MANUS VR FINGER TRACKING COMBINED WITH LEAP MOTION	5	
IMPROVE UNITY3D MAP TO REPRESENT A VIRTUAL SUPERMARKET.	6	
TESTING WITH VR HEADSET	7	
FINAL REPORT	8	
MEDIUM PRIORITY		
SEND WEEKLY UPDATE TO CLEVR WITH SHORT VIDEO	4, 5, 6, 7, 8	
DEMO OF UNITY3D ENVIRONMENT AND HAND TRACKING	3	
DEMO OF LIMB MOVEMENT USING KINECT	4	
DEMO OF FINGER AND HAND MOVEMENT WITH MANUS VR	5	
DEMO OF INTERACTION WITH THE VIRTUAL SUPERMARKET	7	
LOW PRIORITY		
IMPROVE THE EXISTING UNITY3D MAP TO REPRESENT A VIRTUAL SUPERMARKET	6	
ADDITIONAL INTERACTION WITH OBJECTS	7	
IMPLEMENT TEXTURES FOR LIMBS IN VR	8	

Definition of Done

In this part we will describe features that at least have to be incorporated in the final product to consider it done. We can define the definition of done in both the sprint context and the feature context.

Features

As stated before, we will write test cases ourselves and will apply unit testing if this is appropriate. The first step to consider a feature done is when it passes all of the tests we wrote in advance and during the development process. A next criterion it has to pass is that all team members have to be satisfied with the status of the feature at that specific stage. Additionally, all related code has to comply with the standards that have been set by ourselves and CleVR.

Sprints

A sprint is considered done not only if the deadline for that sprint has passed. The product with all things that have been added during the last sprint should be fully functional and (as far as it would be traceable) bug free. All unit tests and (if applicable) end-to-end tests should be passed.

Final product

The most vital part in determining whether or not the end product can be considered done are the feedback and opinions of the product owner. All the must haves that are specified in the MoSCoW part of this plan should be implemented in the product. If the feedback that is obtained prior to and during the development process has to be taken into account, such that the final product deviates as less as possible from the demands of the owners. The features that we specified in the should have section do not have necessarily to be present in order to consider the final product done. However, if no clear, time-intensive reason can be given for the lacking of any features defined in the should have section, we want to incorporate most of them in the final product.

Appendix

User Stories

Developer

- As a developer I want the builds to automatically run when I check in code so that regression errors are detected when they are introduced.
- As a developer I want visual studio together with StyleCop to warn me if I make any styling mistakes.
- As a developer I want visual studio together with VSSpellingChecker to warn me for any spelling errors.
- As a developer I want visual studio together with GhostDoc to help me document my code correctly.

User

- As a user I want to be able to see my own virtual body in the virtual world.
- As a user I want to be able to move my virtual body, while remaining in the same physical place.
- As a user I want to be protected against visual glitches caused by loss of tracking, assuring a safe and visually realistic experience.
- As a user I don't want to be able to kick objects in the world which could case a mess.
- As a user I don't want my virtual body to pass through other virtual objects, avoiding a ghost like appearance.
- As a user I want to be able to pick up grocery items with a natural grabbing motion.
- As a user I want to be able to put the item I just picked up into a shopping cart.
- As a user I want to be able to push the shopping cart to a new destination.
- As a user I want the groceries I put in the shopping cart to stay in the shopping cart.