# PRODUCT PLAN

INTERACTIVITY IN VIRTUAL SPACE

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CONDEXT
TUDelft

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# Product Vision

The field of Virtual Reality (VR) technology has in the last few years taken great leaps forward. New systems released by Oculus and HTC have reduced the costs of VR system to the point where VR is accessible for the general audience, while also improving the hardware specs significantly which improves performance and comfort. But while the hardware received a lot of development during this time, proper VR applications and software are still in its infancy.

The effects of VR can already be seen and felt when using VR software at this early stage. The factor of immersion is something that no other piece of technology can provide. Immersion can already be achieved with movement tracking and vision tracking; which current systems can provide natively. However, things are still lacking in regards to interactivity in the virtual world.

While a lot can be achieved with the features that current VR systems provide, some movement of our physical body, like hand and finger motions, can currently not be tracked, preventing the desired interactivity with objects in the virtual world. For this, new hardware has been developed to complement VR systems. Hardware like Leap Motion and ManusVR provide tracking for hand and fingers movement, which brings VR systems one step closer to interactivity. The next step is to develop software which takes the measured movement and translate it to the virtual world.

This is what our product will provide. Our system will use the Kinect, Leap Motion and ManusVR to provide the ability to interact with objects in the virtual world. Using the data provided by the Kinect we will translate full body motion while the other hardware will be used for translating hand and finger motion. The software will be developed on Unity3D, where we can also build an environment for testing and application purposes.

Our solution can be applied to various problems. One problem where our system can provide great benefits is in the field of health informatics. There is currently a VR system in development which provides therapists with tools to help their clients overcome fear and anxiety. This system exposes a user to environments which they are not comfortable with.

While this system works for static environments, environments that are more dynamic in nature, like a supermarket, poses some problems. In the context of a supermarket, the system lacks the ability to interact with grocery products. This is something our system can solve by complementing the current system in place. Our system makes it possible for the user to pick up virtual grocery items to improve the immersion of the simulation.

# MoSCoW

## Functional

### Must Haves

Essential features required for a successful product.

- The user must be able to pick up grocery items with his hands using tracking hardware such as the Manus-VR and Leap Motion
- The user must be able to see his whole body in the virtual world with the use of the Kinect
- Loss of tracking is handled correctly avoiding sudden unexpected movements which could distress 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

### Could Haves

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

- The user should be able to put grocery items in a shopping cart
- The user could move around in the virtual world with a controller
- The user could interact with trekhaken

### Won't Haves

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

- The user can walk around the store without the need for a controller

## Non-functional

- Must be developed on Unity3D
- Classes must be unit tested when possible
- The frame rate must stay around or above 90 fps

# Roadmap

## Sprint 1

- Setup Project
- Product Vision draft
- Product Plan draft
- Architecture Design draft

## Sprint 2

- Setup Unity3D environment and project
- Product Vision finalized
- Product Plan finalized
- Project Skills assignment (group and individual, deadline may 3rd)

## Sprint 3

- Basic environment done
- Basic simulation of limbs done (input without hardware, ready for Kinect, Manus VR and Leap Motion)
- Demo of virtual environment

## Sprint 4

- Improvements
- Visual model of body done
- Data van hardware integreren (Kinect)
- Demo of body movement

## Sprint 5

- Hand and finger tracking with Leap Motion
- Implement interaction with world
- Prototype finalized
- Demo of hand tracking

## Sprint 6

- Integration of Manus VR
- Implement BBQ weer
- Demo of hand movement with Manus VR and interaction

## Sprint 7

- Improvements
- Bugfixes
- Demo of whole system

## Sprint 8

- Improvements
- Architecture Design finalized
- Final Product

## Sprint 9

- Interaction Design Quiz (individual)
- Final Report

# 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.

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.

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.

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.