Deliverable F
The Ottawa Hospital Virtual Reality Treatment Simulation

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10/31/2019

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Why are we doing the test?

This deliverable outlines Prototype I and devises a test plan while developing the prototype. The prototype itself is very small and is in preliminary steps of the project. The prototype includes a nature screen with buttons put on which helps the patients choose if they wish to start/stop the video.The test itself is a representation of how usable and valuable our product is to the client/end user. As a group, the general objective is learning and adapting. Since this is our very first prototype, we are trying to get used to the fact that if a basic prototype is functional with the patients or not, and if this being the basis of our final project would work comfortably for all the patients.

Tests Objective Description

What are the specific test objectives?

The specific test objectives includes:

1) User-Friendly: The most important thing is user-friendly. We are specifically looking at answers for questions such as how user-friendly is the prototype for the patients? If the patients do face problems, what kind of problems they are facing in operating the system or can they sit through it during their operations without feeling overwhelmed?
2) Efficiency: The second most important thing would be how efficient the program is. This project should be self running and should require minimal support for anyone else. That is something our group is keen on assuring and making sure we test it before the patients/end users start using it.
3) Expense: The third thing is expenses. We as a group are trying to minimize our expenses and make sure that this project doesn't require a lot of money. After our project is up and running we will also try to minimize the operating costs by making sure the video component is very cheap and affordable and can easily be accessed through a file on the VR.
4) Software: Since this project doesn't have any hardware components we are trying to make sure unity works perfectly for this project.

What exactly is being learned or communicated with the prototype?

The prototype provides us with the stepping stones of the project. After the design, completion, and testing, the first prototype reflects on what we as a group intend to achieve through this project which includes creating a proper software (unity) based video for the patients in the hospital. The prototypes sheds light on how the project would look like. For us as a group, we intend to focus on learning the unity, a software which none of us used before. In terms of

communication, we are trying to focus on we can make it easier for the patients to undergo overwhelming operations at the hospital.

Here we show the code for our prototype I and the outcome on unity.

C: > Users > User1 > Documents > TOHProject > Assets > FrenchScript.cs

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class FrenchScript : MonoBehaviour
{
    // Start is called before the first frame update
    void Start()
    {

    }

    // Update is called once per frame
    void Update()
    {
    leftData.worldSpaceRay = new Ray (rayTransform.position, rayTransform.forward);
    //leftData.worldSpaceRay is the pick ray of the controller, I don't know how to add that
    if (controllerIsPresent && VRRaycaster.Instance != null) {

    GameObject label1 = GameObject.Find("PleaseSelectLanguage");
    GameObject label2 = GameObject.Find("English");
    GameObject label3 = GameObject.Find("French");

    text1 = label1.GetComponent<GUIText>();
    text2 = label2.GetComponent<GUIText>();
    text3 = label3.GetComponent<GUIText>();
    //Please select language --> Start right away, pick and watch
    text1.text = "Commencer Maintenant";
    text2.text = "Choisir";
    text3.text = "";
    //Start right away is selected --> roll video
    //pick and watch is selected -->pan over clips
```

Figure 1. The code involved in Prototype I.

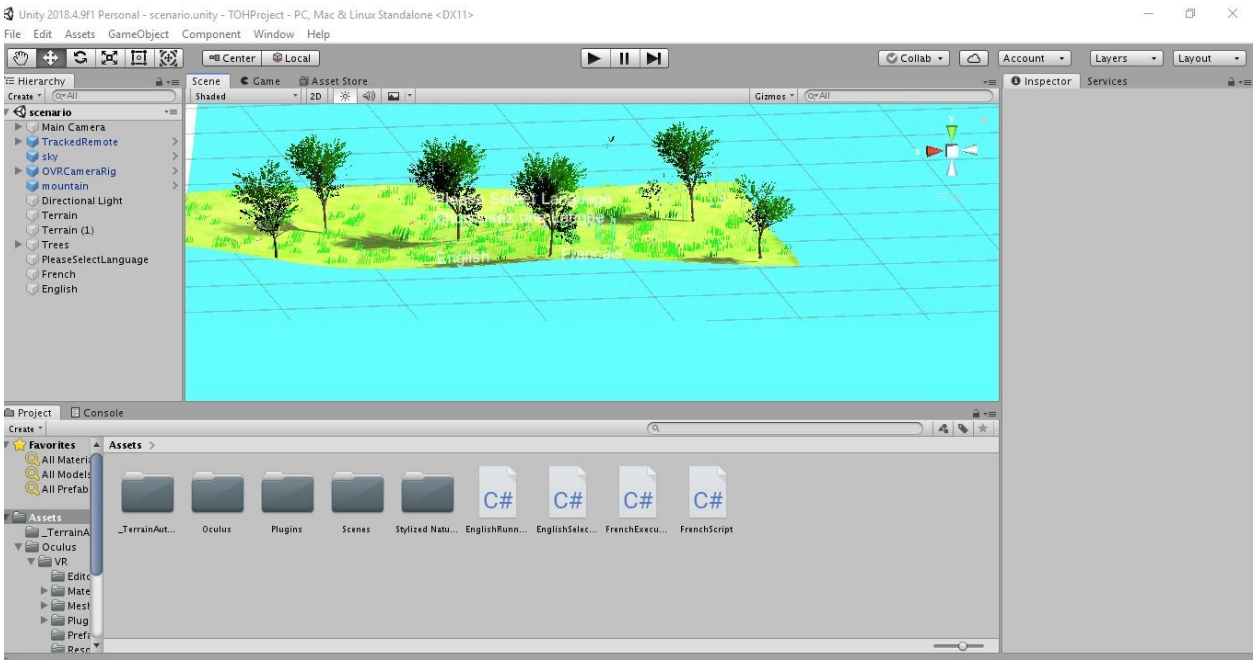

Figure 2. The result on Unity.

What are the possible types of results?

Since the prototype itself is very basic and small we won't be seeing a wide variety of results or discrepancies. Possible results includes the client asking for more details and a variety of videos incorporated, the patients/client not liking the design and fully scrapping it, and the software not running properly which would be a mistake on our part.

How will these results be used to make decisions or select concepts?

The results would be very fruitful in yielding exactly what the client is looking for and how we can provide them with that desired output. We as a group would use the method of elimination and then addition. We would focus on criteria provided us all throughout the course, follow up on the client feedback and make sure we incorporate the changes that are recommended to us and take out the ones that are not liked by the client/patients.

What are the criteria for test success or failure?

In the end what we look at as a group are three major things which happen to be:

1) The software and videos we make on unity must meet all quality requirements mentioned in the project and that are also outlined by the client/patients' expectations.
2) The project itself must be developed within the time frame provided to us and the prototypes must also be developed before they are due.
3) The project itself must be developed within the budget and to be fair the project would be very much in the costs mentioned which less than $100.

What is going on and How is it being done?

Describe the prototype type and the reason for the selection of this prototype.
The prototype we as a group are aiming for are comprehensive prototypes. We choose comprehensive prototype as our approach because that offers us the opportunity to do rigorous testing of our prototypes and every testing lets us reach a milestone and integrate our prototypes accordingly. As we progress in the project, comprehensive approach also helps us to implement many attributes of the project into different prototypes which accordingly (after the client feedback) helps make our project better.

Talking about what the project encomposses (critical components or systems) based on our current knowledge of engineering science or other knowledge, we have the graphics which includes a simple nature scene, three text objects, and an oculus main camera from the OVR suite. Talking about the software; the code identifies pic ray of unity controller using the OVR suite and it identifies text GUIs in the frame. For example, if one of the text objects is selected by the pick ray, it changes the text prompts from the chosen language to choose the video type.

Describe the testing process in enough detail to allow someone else to build and test the prototype instead of you.
The file for the prototype, including the code and nature scene, were uploaded to unity. We then made sure that the scene worked on unity. We then set up a Vive VR machine in order to test how the prototype functioned with VR. Unfortunately, the code was written for the Oculus Rift which we did not have access to so we could not test if the selection menu worked. After editing the file within unity so that it would be compatible with the Vive we tested out the nature scene with VR.

What information is being measured?
The functionality of the nature scene for the option selection menu was being measured. The overall look of the scene in VR was also being tested.

What is being observed and how is it being recorded?
It was observed that the prototype worked properly with the Vive. This was recorded

What materials are required and what is the approximate estimated cost?
Since this project based around unity and mostly software based we would only need unity to finish this project. If we happen to have any plugins involved and any other editions for buying unity group that would be the only cost involved and would amount to about $50-70 maximum.

What work needs to be done?
The project would be tested on unity and subsequent research would include knowing about more applications on unity and how can we make the prototype better and in the form of the project which the client would like.

When is it happening?

How long will the test take and what are the dependencies?
The test should not take long and could be completed very quickly by checking the prototype. Before we start beginning the testing we are supposed to set up a base prototype for the project and then design the prototypes according to the requirements mentioned in the project and also outlined in client expectations and feedback.

A separate test planning Gantt chart can be created to help make sure that the testing fits with the overall project schedule or it can be defined as part of that schedule.
A separate xlsx file representing the Gantt Chart for the testing has been attached but a screenshot is also posted below showing the various prototype work dates.. It shows how it would be incorporated into our project work such as deliverables.

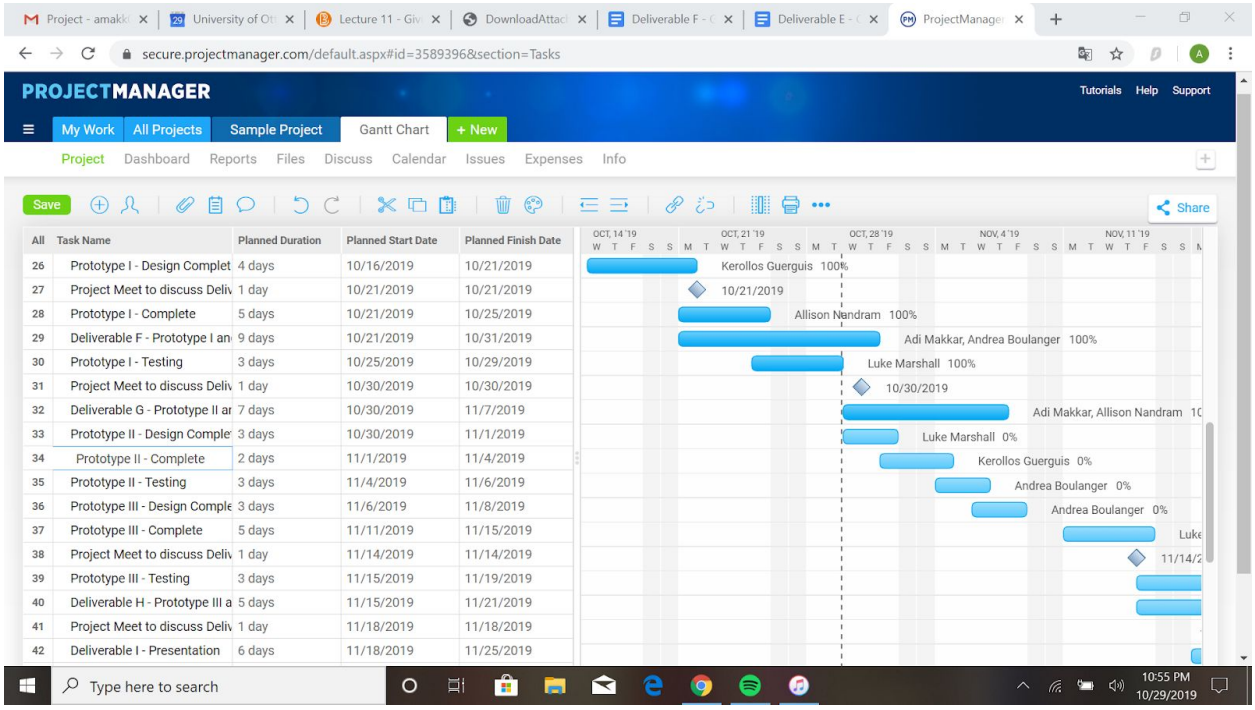

Figure 3. Gantt Chart

When are the results required?
After the results of this testing we aim to decide on what do we in box for prototype II. We would especially look at client feedback and turn our prototype I into something more advanced. The project happens to be in its very preliminary steps at the moment and adding on something more advanced would serve its purpose with the client and the patients.

Stopping Criteria

For the stopping criteria we are looking at the following figure shown below:

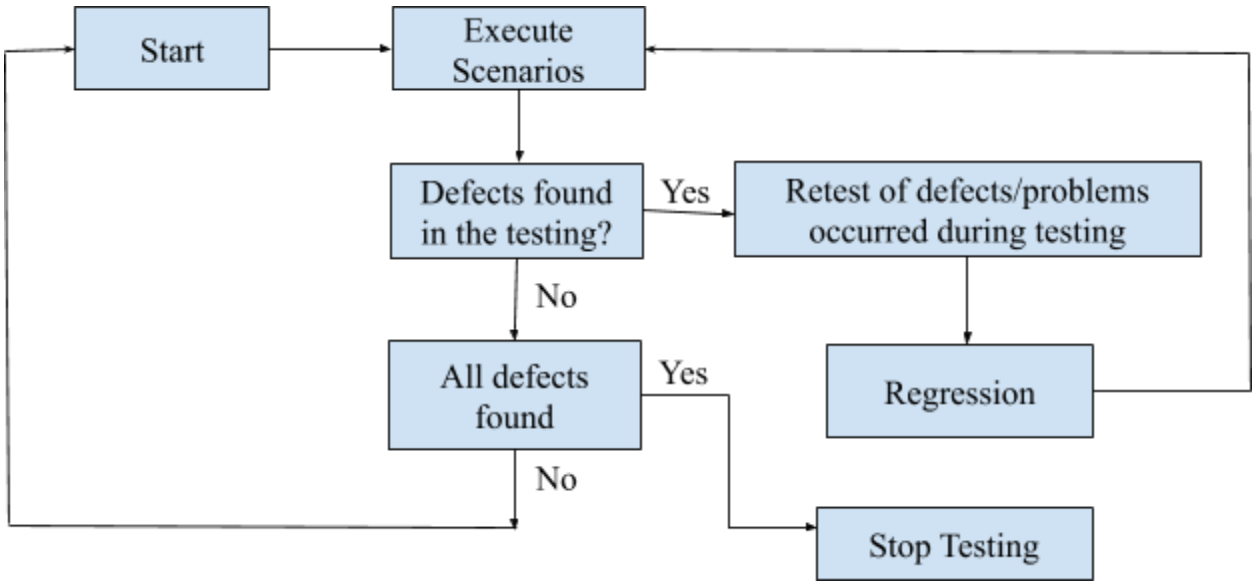

Figure 4. Stopping Criteria for Prototype I