

Project Deliverable G: **Prototype II and Customer Feedback**

GNG 1103 – Engineering Design
Faculty of Engineering – University of Ottawa

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March 12, 2023

Abstract

This report is dedicated to the development of our second prototype and a test plan for our final prototype.

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Introduction

The purpose of this deliverable is to develop our second prototype design, which includes improved test plans, analysis, and more results. We will be improving our design by the feedback given to us by our client. This prototype will focus on implementing the bulk of the story, refining scene flow, and further define the art style.

Client Feedback

The client liked the storyline update that we made based on their feedback from the last meeting with them. The touch of engineering was very immersive and realistic since it adds a sense of what real system failure would be in autonomous weapons. We think we are on the right track, and we just need to improve the points we already developed.

Prototype II

Design Specifications	Relation =, < or >	Value	Units	Verification Method
Functional Requirements				
Space required (Play area)	<	1	Meter squared (m ²)	Estimate, test, final check
Headset model	=	HTC Vive	N/A	Continuous testing during development
Ease of use	=	Yes	N/A	Beta testing prototype
Languages	=	English, French	N/A	Consult OLBI at uOttawa
Constraints				
Violence	=	No	N/A	Ensure/analysis
References to real world entities	=	No	N/A	Ensure/analysis
Consider health conditions	=	Yes	N/A	Ensure/analysis,
Cost	<	400	Dollars (\$)	Estimate, final check
Duration of experience	<=	5	Minutes (m)	Estimate
Delivery time	=	3	Months	Estimate
Feminist/anti-racists	=	Yes	N/A	Ensure/analysis
Operating conditions	=	Enclosed environment	N/A	Ensure/analysis

Non-functional Requirements				
Graphic Imagery	=	Yes	N/A	Test
Safety: (Low range of motion)	=	Yes	N/A	Test
Reliability	=	Yes	N/A	Test
Relatability	=	Yes	N/A	Test
Realistic	=	Yes	N/A	Test
Call to action at the end	=	Yes	N/A	Test
Aesthetic appeal	=	Yes	N/A	Test

Prototyping Test Plan

Test	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)
1	Audio checking	Prototype 2	<ul style="list-style-type: none"> • Clear • Captivating • Bilingual 	10 min
2	Movement checking	Prototype 2	<ul style="list-style-type: none"> • Smooth • No glitches • Effective 	10 min
3	User Interactivity	Prototype 2	<ul style="list-style-type: none"> • Limited • Immersive 	10 min
4	NPC motion	Prototype 2	<ul style="list-style-type: none"> • Realistic 	10 min
5	Script/Dialogue	Prototype 2	<ul style="list-style-type: none"> • Accurate • Correct grammar 	10 min
			Total	50 min

Experimental Model

We individually accomplished different tasks and were able to improve our product since our last prototype. This section is dedicated to showcase our latest modifications. The link below is a video showcasing our second prototype and our new additions to our product.

[Prototype 2.mp4](#)

Script

Please see attached PDF file named "Storyline Script".

Analysis

The purpose of this section is to highlight a detailed update of our conceptual designs.

Results

This prototype focuses on a more detailed version of our first prototype. We will be testing out more aspects such as audio, NPC motions, waypoints, incorporation of more assets, detailed scenes, user interactivity and more.

Art Style and Accessibility

the art style of our product will be as related as possible since we will make sure to choose a relevant environment similar to the modern day and technology. Also, the art style will be easy to recognize and make the user comfortable by providing a realistic and immersive experience. The interface will be convenient and simple to use in order to avoid any confusion and make the user focus on the experience more.

User Interactivity

The user interactivity we have incorporated into the prototype is involves limited movement but keeps the user engaged. The user interactivity is meant to be a supporting element that guides the user through the experience and, in turn, causes them to feel as though they are in the experience.

Interactivity currently in the experience:

- Choosing their desired language
- Clicking next on the text boxes containing the dialogue displayed to move onto the next one.
- Teleportation
- Subtitles are typed out one by one at the bottom of the screen.
- Putting the text boxes into places where it would naturally be (ex. Computer screen)

These points and ideas were all created keeping in mind 3 essential elements to our experience: keeping the user engaged, keeping the users experience controlled and as efficient as possible and making them feel as though they are in the scene. Teleportation is a very important aspect of our experience as it allows the user to move around freely within an area that we have delegated with the use of planes in Unity. This is a solution to the client requesting that the user physically move as little as possible while keeping the user engaged and feeling like they are actually in the environment. Clicking on the text boxes allows for the user to read at their own pace and ensures that they understand everything that we are trying to get across as opposed to just throwing information at them. As well, having the text boxes being typed out as if someone was reading it captures the attention of the user and will help to get our point across effectively.

Next steps for user interactivity for prototype 3

- Voice audio
- Putting the text boxes into places where it would naturally be (ex. Computer screen)

For Prototype 3, the main goal will be finalizing the UI and pulling all the aspects together to make it as realistic as possible; ensuring that the UI works to support what the client had requested for the VR experience.

Audio

The audio part will be emerged throughout the whole product. The sound effects will be fitting with the environment and the whole atmosphere. Also, a voiceover act will be incorporated with the script part. This will enhance the immersive experience and help draw the attention of the user and affect their decision.

BOM Update

Below is a list of potential asset options -meaning not all of them will be used.

Part #	Part Name	Description	Quantity	Unit Cost	Extended Cost
1	Personal computers	Provided by team members and university	5	NA	NA
2	Unity	3D game engine. Student/Personal edition used	5	NA	NA
3	HTC Vive	VR set, provided by university	1	NA	NA
4	Control/Security Room Interior	Unity asset control/security room interior	1	9.99\$	\$9.99
5	Unity Asset: Sentinel Drone	Unity Asset sentinel drone	1	15\$	\$15
6	Unity Asset: Abandoned Area – Ruined Factory	Unity Asset abandoned area - ruined factory	1	35\$	\$35
7	Unity Asset: NPC populator	Unity Asset NPC populator	1	15\$	\$15
8	Unity Asset: Guns pack: low poly guns collection	Unity Asset guns pack: low poly guns collection	1	0\$	\$0

9	Unity Asset: Autonomous weapon	Unity Asset https://assetstore.unity.com/packages/3d/props/weapons/acs-114947	1	5.55\$	5.55\$
10	Unity Asset: War Effects	Unity Asset https://assetstore.unity.com/packages/vfx/particles/war-effects-67573	1	14.50\$	14.50\$
11	Unity Asset: War Debris Pack	Unity Asset https://assetstore.unity.com/packages/3d/props/industrial/war-debris-pack-145298	1	14.99\$	14.99\$
12	Unity Asset: Suburb neighbourho od house pack	Unity Asset https://assetstore.unity.com/packages/3d/environments/urban/suburb-neighborhood-house-pack-modular-72712	1	89\$	89\$
13	Unity Asset: Office pack	Unity Asset https://assetstore.unity.com/packages/3d/environments/sci-fi/free-sci-fi-office-pack-195067	1	0\$	0\$
14	Unity Asset: Post- apocalyptic destroyed buildings	Unity Package https://assetstore.unity.com/packages/3d/environments/urban/post-apocalyptic-destroyed-buildings-223947	1	42.99\$	42.99\$
15	Unity Asset: Abandoned Factory Buildings- Day/Night Scene	Unity Package https://assetstore.unity.com/packages/3d/environments/urban/hdrp-abandoned-factory-buildings-day-night-scene-164492	1	50\$	50\$
16	Unity Asset: Ruined City Update	Unity Asset https://assetstore.unity.com/packages/3d/environments/urban/ruined-city-update-18107	1	29.99\$	29.99\$
Total					\$322.01

Test Plan for Prototype III

Test #	Test Objective (why)	Prototype used and Basic Test Method (What)	Description of Results to be Recorded (How)	Estimated Test duration and planned start date (When)
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1	Audio checking	Prototype 3	<ul style="list-style-type: none"> • Clear • Captivating • Bilingual 	10 min
2	Movement checking	Prototype 3	<ul style="list-style-type: none"> • Smooth • No glitches • Effective 	10 min
3	User Interactivity	Prototype 3	<ul style="list-style-type: none"> • Limited • Immersive 	10 min
4	NPC motion	Prototype 3	Realistic	10 min
5	Script	Prototype 3	<ul style="list-style-type: none"> • Accurate Correct grammar 	
			Total:	40 min

Conclusion

In brief, we analysed the constructive feedback given to us by the client and we integrated it into our second prototype to improve it. In addition, we tested out more aspects for our product and showcased our results. We updated our BOM and developed a test plan for our last prototype, which will mainly focus on bringing all of our components together.