

Name: Jared Nickson

Student Number: 2305434

Student Email: 2305434@Student.uwtsd.ac.uk

Assignment Title: Game Mechanic Prototype/Virtual Production Prototype

Module Title: Indie Games Development

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Presentation Video Link:

<https://www.youtube.com/watch?v=SGoENmcAW28>



Introduction

- What was each team member tasked with doing during the project?
- What will I be presenting?

(ANY ASSETS I DON'T SHOW HERE IS IN THE LEVEL DESIGN PRESENTATION)



PowerPoint Presentation Link:

Script:

Hi, my name is Jared and for this assignment we are to work in groups to design and develop a game of our choice in Unreal Engine 5. Alternatively, we can utilize Unreal Engine to prototype a Virtual Production scenario using mobile technologies in a real-time compositing pipeline.

Our prototype should have the essential elements of an in-game camera system that is fluid and intuitive. It should have a variety of scripts and or blueprints that we have created which incorporates a good range of code implementation techniques for games.

We are to deliver an individual presentation presenting not only individual work contributed to the project but as to how the team worked as a whole.

So, what was each team member tasked with completing?

I was tasked with creating a variety of assets that are core for our gameplay experience, for our indie games development assignment I will presenting assets relevant to this assignment, anything I haven't mentioned here has already been showcased in our level design presentation.

My team members, Rebecca, Chloe, Justin, Teifion, and William also have core assets and mechanics for our gameplay experience.

Rebecca was tasked with implementing a wide range of models into our game, she modelled most of the jewelry in our game and made many other models for our game. She also created the original level block out which I later made an expansion of. She also made other models, such as chairs, desk clutter, the vault and its animation, a desk monitor and the keypad for the vault door.

Chloe also made core assets for our gameplay experience, she was tasked with the art and designs of the menu user interfaces and designs of the storefront, she also modelled a variety of assets like jewelry, and jewelry stands themselves.

Justin was tasked with creating other essential aspects of our game, these being assets such as, chandeliers, a gun, lights for the office, money, and chairs which all are vital for our core gameplay experience.

Now to our programmers we worked with when creating the game:

Teifion was a core contributor to making the game work, he coded the vault door keypad minigame which has randomizations of answers, he also made a health bar mechanic Aswell as the coding for a stamina bar, when the player sprints it will consume stamina from the stamina bar, he also made the looting of the models to turn them into a money counter at the top, when you press E on a gold bar or coin you will pick them up and the amount of money you have at the top of the screen will increase, he also made a ray cast function – this is to display where the player is trying to aim, so when the player presses E it will send out a ray of red light which hits objects and shows to the player it has hit an object, this is helpful when gauging the hitboxes.

William also made core contributions to our gameplay, he made the Ai for the guards, for example, if a guard sees you, they then run towards you, he also made a security camera which displays the players model and its surroundings onto a flat plane – this is like watching a live feed of a security camera on a computer screen. Will also made vents for the player to go into to teleport to a different area of the map, which helps with the stealth of our game. Will also included a low-quality filter over the screen to make the game feel low poly which is why most of my assets are high poly as they are harder to make the details out.

And for communication:

We each often messaged each other on both Teams and Discord with all of us keeping up to date on what we each are doing; here is a screenshot of our team's chat for example. Rebecca set up the team's chat, she also set up the place where we each uploaded our work onto teams for us each to access if needed, here is a screenshot of that too:

We also uploaded our Unreal Engine zipped Unreal Engine project saves to Teifion's shared Google Drive, this was so that it's easier to compile our work into one project or save. Teifion was the one who compiled all our work into one save, which he then sent a link to his Google Drive in his work.

And now to my assets I created that are relevant to this assignment:

Firstly, I made another Security Camera, the role of the security camera was to give the player a reason to be more careful and plan their moves by dodging the vision cones of the camera. I didn't have any issues with the modelling; however, I did encounter some issues when trying to import my animations of the camera into Unreal, I exported my model with game exporter, and here are the settings I had for it:

I tested both the model and the animation FBX files and none of them carried over the animation into Unreal. Here are the import settings in Unreal:

I selected import animations and kept the animation length as exported time, and then I clicked import all, however I then got an error message saying the animation import is not compatible with Unreal's 30fps framerate. And the animation asset isn't in the content drawer:

So I then thought it was something to do with the exported framerate from maya, so I changed my animation in maya to 30 fps and did the same export settings, and this time the animation asset imported, I then dragged it onto Anim to play, and played the game to test it, but I was disappointed to see that it still didn't work, here is a video demonstrating this:

And here is the animation in maya as a play blast:

Besides the camera animation not working, I decided I could still use the model and place them strategically on areas the camera is looking towards. Here are a few shots of this:

I then went on to make a character model, the purpose of which was to implement stress to the player to try and avoid the guards and customers to stealthily, I did find the character model quite tricky at first to model, the hands especially I found tricky to model which is why they don't look as good compared to the rest of the mesh.

Here is the reference image that helped me shape the character model:

The image was used to shape the model which is why my character mesh doesn't look like the Reference.

The texturing of the character model was simple, I placed the skin smart material on the mesh and altered the settings to fit better, I then placed an image of an SS Guard uniform for the Guard uniform, this was to make the guard look more authoritarian.

And here is the tutorial that helped me understand how to create the character mesh from the beginning:

And this video here also helped me when sculpting the character's face to highlight the jawline, cheekbones, eye sockets and forehead.

I also met the same issues when importing the animations of the character into Unreal as I did with the security camera, I did the same export settings and tried both the mesh and animation FBX, but neither of them worked, here is a video demonstrating what I mean:

And here is a play blast of the animation working in maya:

In future projects, I aim to fix this issue and enable it to import animations into Unreal Engine. I'm not sure as to why it wasn't working either.

I then went on to make a coin model, the purpose of which was to use as a distraction tool to distract guards, it was also to be used as a low value item the player can steal, the modelling and texturing of the model wasn't that difficult to do.

For the texturing I decided to use these two images, and I drew the highlights of them in Substance Painter with a different material, this was to add a bit of humor to something even if it is hard to see.

I then scattered them throughout the level using Unreal's foliage tool, I knew coins should be in a vault but at the time of placing them I didn't think that it looked a bit odd as to why the coins are all over the floor, I have come to understand that a vault would indeed have neatly stacked coin assets, and in future projects I aim to have a more deliberate approach at asset placement to avoid it seeming randomly plotted about.

I then went on to create gold bars, these would function as high value items the player can steal which would give significant gains in money. I didn't have any trouble when modelling or texturing the gold bars as they are simple to construct and texture. I decided to unevenly lay them out to signify that they are often inspected.

And here is a screenshot of how I placed them in the vault:

Teifion's mechanic where you can steal items and get money from them will be shown here, this video displays the stealing mechanic Teifion made with the models created by me:

I then created a stun gun; the use of the stun gun was to immobilize the guards for a short duration and that it only has one use per level. I believe I did an excellent job at modelling

the stun gun, I gained a better understanding at using maya's tools more effectively, I learned how to completely utilize the symmetry options and I also learned how to use the soft selection which helped me when shaping the grip of the stun gun.

Here is the reference image that helped me structure the stun gun:

I didn't model it one to one as most of the details will not be seen due to the low-quality filter that Will has implemented into the game. I didn't run into any issues when modeling or texturing the stun gun either. I decided to change the color scheme to have more yellow to highlight that it is a stun gun and not a standard gun.

Here is the video that taught me how to use the soft select tool in maya:

I also modelled prongs that will be shot out of the stun gun, I didn't encounter any issues when modeling or texturing the prongs as they were simple to create.

I then went on to create a handheld laser cutter, the use of this in the game was to have a slow but silent approach at taking loot from the glass cabinets, the player would use this on the glass and will be able to take the loot silently, however this comes with the drawback of being slow and risking the guards noticing you. I didn't encounter any issues when modelling or texturing this model, however I learned how to use soft selection after creating this model which I believe would have made the design come out much better.

And here is the reference image I used to help me structure the handheld laser cutter:

I chose this design as it looks light to carry and versatile with its ability to cut through things, which I believe works well for our game as being a thief.

I then made a crowbar which the player can use as a fast but loud way to steal loot from the glass cabinets, the player would interact with the glass cabinets and it would then smash the glass letting the player take the loot immediately, however this also alerts all the guards in the store. I didn't encounter any issues when modelling or texturing this model as it was also pretty simple to create.

And finally, I created a combat knife. The purpose of the knife was to give the player an option for self-defense. It would one-shot the character the player interacts with and can be used repeatedly. I think I did an incredibly job at modelling and texturing this knife, it looks almost identical to the reference image, and I believe it is one of my best works yet. I

didn't encounter any issues with the modelling or texturing, however I did have an issue when exporting, when exporting normally the mesh would be distorted in unreal, so I then decided to upscale the model significantly because I thought it was too small and that was what was messing the geometry up, however the same issue occurred. After tinkering with the settings, I found that the Triangulate option which turns all faces into triangles fixed the issue and the model turned out as expected in Unreal.

And here is the reference image that helped me shape the knife:

And I thought its worth mentioning, I attempted to do some coding to implement an interact function and make it so that the player character can pick up and drop items, however I was unsuccessful in doing so.

Here is the interact function:

And here are the project settings showing what keys the player should press to pick up and drop:

And here is the incomplete coding on the first-person character blueprint for the pick-up and drop mechanics:

And here are the videos I used to try and implement this mechanic:

What I thought went well in this project was that we effectively communicated as a team and that we created a wide range of assets individually throughout the project.

What I think must be improved however, is that we should plan the project more thoroughly, as we and I myself prioritized easier assets over harder and more time-consuming assets due to misjudgment in how long it would take to create these assets.

I also aim to properly implement animations into unreal and will try to fix the issues I had when importing animations from maya to unreal.

And here is my Bibliography in IEEE format: