Game UI/UX Design with Original Character Concept Design and Dynamic Effects.

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ART CREATION MASTER’S THESIS POST-MORTEM
CHARACTER SELECTION SCREEN WITH
UI/UX DESIGN AND CHARACTER EFFECT

ZHUO DAI –
ADVISOR(S) – JOOWON MACDOWELL

Figure 1 Key Art – To be replaced with project specific artifact key art

ARTIFACT - SYNOPSIS

My masteries are Character Concept, Dynamic FX, and UI/UX design. The objective of my thesis project was to build a UI/UX flow for a conceptual game that I had designed. It included original character designs and dynamic effects to effectively convey the concept of the game and the personalities of the characters. There will be a character selection screen showing different concept model with VFX demonstrating their personality.
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**PRE-PRODUCTION**

**ARTIFACT DESCRIPTION**

This thesis artifact results will be focused on making the character selection screen using the camera transition and diegetic UI floating around the characters.

The character design will be one main character, a summoner, with different summoned ghosts. The ghost will only have upper body and no complicated textures. The player will select between different ghosts and the character will switch different poses.

The character and the ghost will have different VFX displaying to show their ability concept. And the UI elements will have different variations.

The UI design will include a full menu flow and every button should be functioning, there will be some HUD showing information when selecting the character, and there will be some variations for different characters to make it more interesting.

**Character concept**

I’m doing a character selection screen so I will need at least 2 characters so that players can choose back and forth. I’m thinking about making one summoner as the main character with different summoned ghosts around him. So I will need to design 2-4 different ghost concepts.

**Dynamic FX**

There will be VFX showing the character’s ability or characteristic, the VFX will be practical effects and interact with the character. There will also be some VFX for UI design so it won’t just be only a bare on-hover effect.

**UI/UX design**

For the menu part, each section should all be interactive, so I will need to design the effect for each button and make every part interactable. I’m also designing some variations for each character so they will have some slight difference to keep the whole UI more interesting.

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**CHARACTER CONCEPT**

I’m doing a character selection screen so I will need at least 2 characters so that characters can choose back and forth. I’m thinking about making one summoner as the main character with different summoned ghosts around him. The summoned ghosts will only have the upper body and the texture will be relatively easy and stylized, so I won’t spend too much time on the full-body modeling and textures. My focus will be on the concept design and illustrations.

**DYNAMIC FX**

There will be three basic stages of character animation, character show-up animation, character idle animation, and character skill animation. Each will have dynamic FX included to show different abilities and characteristics.

**UI/UX DESIGN**

For the menu part, each section should be interactive, so I will need to design the effect for each button and make every part interactable. I’m also designing some variations for each character so they will have some slight differences to keep the whole UI more interesting.
CHARACTER SELECTION SCREEN WITH
UI/UX DESIGN AND CHARACTER EFFECT

Character selection screen with skill effects and UI graphic design

Summary of Artifact:

This thesis artifact results will be focused on making the character selection screen using the camera transition and diegetic UI floating around the characters.

The character design will be one main character, a summoner, with different summoned ghosts. The ghost will only have an upper body and no complicated texture. The player will select between different ghosts and the character will switch different poses.

The humanoid and monster creatures will have different VFX displaying to show their ability concept. And the UI elements will have different variations.

The UI design will include a full menu flow and every button should be functioning, there will be some HUD showing information when selecting the character, and there will be some variations for different characters to make it more appealing.

Character Concept:

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Dynamic FX:

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UI/UX Design:

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Field Research and Methodology:

1. Character Concept:
For the pipeline aspect, I checked some pipeline introduction videos on YouTube. Like this video: https://www.youtube.com/watch?v=D4mW-ZeXwtg

Figure 2 screenshot 1 https://youtu.be/D4mW-ZeXwtg?t=84

This is the overall pipeline for character concepts, there might be some variations between different preferences, but it should be based on this principle.

Figure 3 Screenshot 2 https://youtu.be/D4mW-ZeXwtg?t=343

Thumbnails are a very important step in concept art. Thumbnail means you are using some very rough lines and causally catching different shapes of one character to get inspiration or explorations. I found this video useful: https://www.youtube.com/watch?v=J8g3JKobvnk. In the Video, he introduced his preference and pipeline for designing the character. So, first, it would be better to start with a blank sheet of paper and pen to write down keywords and start sketching very basic silhouettes.

Then, we will move to digital software like Photoshop or Procreate to convert the paper silhouette to a digital concept, drawing concepts in digital media makes things easier to adjust and explore, this is also the time when we try to figure out the basic shadow and the lighting to indicate the overall outfit and feeling this character has.

This is a good silhouette to show different people their feelings and feedback, and then we can start refining one or two above those to get a more detailed design draft/exploration. Also using more than two grey colors to distinguish different textures and details.

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3 Character design workflow - concepting for 3D games and Movies (2020) YouTube. Available at: https://www.youtube.com/watch?v=J8g3JKobvnk&t=190s (Accessed: 23 April 2024).
At this point, the designers can start with color explorations for these characters, since it’s not finalized we still have time to explore some variations to see which one works the best.

For Character Theme Concept:
I browsed a lot of ideas on Art Station or Pinterest. Since my main point is for players to select characters, I’ll need to have at least two characters so the players can switch between two different characters, that leads to some other questions which are: Is switching between characters interesting enough for players to choose? Am I over-scoped if I want to make 3-4 characters? What kind of character styles I will do? How detailed should I go for design and actual sculpting? After tons of research and checking in with professors, I finalized my character theme which is: **The Summoner and his Summoned Ghost.**
This theme is mainly about the world where players play as a summoner and he can summon different ghosts from their mind, it could be a real person, or fictional character or even from mythology.

I first got this idea from this set of concept designs; I could just make one main character and make other 2 or 3 characters with only the upper body, in that case, my 3d pressure will be less but also the result would be more interesting and fancier than just two characters.
For the main character, I want it to be more Asian style but also world-wise generic which means it is not specifically from one culture or one style, because I need it to fit in different monster styles. It will be like a mix of different elements and styles, like the picture I showed below.

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For the three summoned ghosts, I have three rough ideas now, the first one is gold glowing god with 6 hands. The concept of this ghost is more about healing.


The second one is from the Chinese novel “Journey to the West”, Sun Wukong. The concept of this ghost is more about attacking.

---


The third idea is a rock monster, the concept of this is more about defending.

I also did some research for my final quality which you can see in the picture below because I’m making more characters than most people, and I don’t want to get over-scoped. The basic art style will be cartoon-realistic. It is based on realism but I won’t spend too much time replicating the reality, it will be more stylized.

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Dynamic FX:

When players are selecting the characters, the main character will do some interaction animation with the ghost he summoned which will also include some dynamic FXs in the animation.

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The dynamic effect I’m trying to do will be the effect ghost showing up, the effect when the ghost interacts with the main character, and also the effect when the ghost is showing his feature ability.

There are many tutorials teaching you how to do VFX in Unreal.

So for my personal project, I already tried some visual effects in Unreal Engine, some of them are dynamic and some of them are practical. I tried the burning fire effect which you can just put the Niagara in the animation modifier, also I tested the animated materials using the level blueprint.

UI/UX Design:

For the UI aspects, I watched a lot of tutorials and principles for UI design, here are the two videos I found pretty useful.

The first video shows the basic pipeline for UI design. 1. Sketch


15 “100 Real Time VFX Tutorials | unreal Engine Niagara Tutorial | UE4 Tutorials | Download Project Files.” YouTube, September 2, 2019. https://www.youtube.com/watch?v=Z4jYquO6w8&list=PLwMi8tF6w7sqC7_clmD26ts0YDbtPCCfe.
1. Finding the user’s task and what we need to achieve in this system, designers will usually write down all the tasks and features or the things we need to include and make it as a sheet for future use.

2. Sketching draft: Then, we will go through the sketching part. You will be using the basic shape to block out the screen to get the high-level idea out of your mind and start the conversation with the users which is also very cheap to change if necessary.

3. Wireframing: this stage is about using placeholders to get a more detailed version of the demo showing the basic layout of each screen. Also, to explore more ideas or more explorations.

4. Components: this is the stage when you dig deeper into the visual design part, you will start to design how the UI will look. How each button will interact with the player, what is the animation of the on-hover effect, and how the menu will move. It is also the time to test which features are not achievable and then we can move on to the backup plan.

5. User and task flow: you will connect all the menus you’ve made in the previous stage, also the time to get the user’s feedback about the design and flow.

6. Mock-ups: this is for the production stage which means you will make every detailed part of the UI design you had before.

7. Prototype: prototype means you are importing all the elements into the platform your target users are using.

This is the basic pipeline for UI design, but it varies for different people but also for different pipeline, so, I need to make a more detailed pipeline for the game industry.

For the principles, even the pipeline for UI varies from different industries but the overall design principles are basically the same because it is all about visual design and giving information. The second video shows the 6 principles for UI design, https://www.youtube.com/watch?v=NTmh8I-Xl4c

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The principles are basically these 6 points:

1. **Contract**: with all the information displayed on the screen, it is important for the designer to know what the most important things should the player know first and how will the feedback designer give back to the users while they are operating. Using different Font styles, using color differences, or the contract of scale are usually a few of the most common ways to use this.

2. **Consistency**: for different UI pages, it is important to have something that connects them together so the players will know they are all from the same background. Also, it is also important to keep consistency on the same page because if you don’t, you are just adding more useless details to the menu which will distract the players.

3. **Typography**: Font makes a huge difference in demonstrating the game's vibe and atmosphere.

4. **Color**: same as the font, the color pattern will also show the players the vibe of this game at first glance. Not only the warm color and the cold color but also the brightness and saturation of one color.

5. **Visual hierarchy**: having good visual guidance will create a convenient atmosphere when players first see the menu.

6. **Spacing**: this will help the visual hierarchy, but also tell the players which parts are together and which parts are separate so they won’t get confused.

UI plays an important part in showing how one game feels to the players.

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The use of this font gives an 80s game style directly to players.

![Figure 23](https://www.gameuidatabase.com/gameData.php?id=1573)

The paper texture background and the font use indicate that this game might happen in the mid-ages of Western culture.

![Figure 24](https://www.gameuidatabase.com/gameData.php?id=1530)

Using this kind of font and simple design could applied to most types of games but usually, the game will be serious and modern sometimes maybe sci-fi style.

When it comes to the actual design, I can’t just show a character selection screen without any other menu, so, even though those functions are not functioning, I still need to include them in my project, to make it more appealing, I will put some efforts in the UI motion design and menu transitions.

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I personally found the UI of Persona 5 and Dishonored 2 to be awesome, they both put much effort into UI motion animations and Menu transitions, and that’s exactly something I want to dig deep into. I did some UI motion tests in AE for my TGP project to get a better understanding of camera movement and good timing of transitions.

The GIF above is from the game “Dishonored 2”, I get most of my inspiration from this game, you can see when you select the character, the camera will move along with the UI and there will be some diegetic UI showing up to indicate some information. The right picture is the menu design and the UI motion design, when the player goes to the menu, it’s not just a pop-up screen, there is a very brief camera rotation at the beginning, and the UI is not in the same flat layers, they are separate in different layers so when the camera rotates, it makes the menu more appealing. Additionally, when you choose different buttons there are also many on-hover animations showing up.

To achieve this, I found a tutorial on YouTube about how to make a 3d UI in an environment, I think I could apply my motion design in AE to Unreal Engine by using different plane layers.


Same as the main character, I want my UI overall art style to be based on Asian style but also generic so they could fit in more different characters. Also, I will do some variations in UI elements for different characters to make the project more interesting.

I also found a tutorial on YouTube about how to make a 3d UI in an environment, I think I could apply my motion design in AE into Unreal Engine by using different plane layers.

Same as the main character, I want my UI overall art style to be based on Asian style but also generic so they could fit in more different characters. Also, I will do some variations in UI elements for different characters to make the project more interesting.

There is a website called “GameUIDatabase” https://www.gameuidatabase.com/index.php
This website shows almost 1000+ game UI art styles and the flow of each game.

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24 “Make a Realistic Head Bobbing Effect in UE5 (First Person).” YouTube, April 29, 2023. https://www.youtube.com/watch?v=o1g22erv-2Y.
Same as the main character, I want my UI overall art style to be based on Asian style but also generic so they could fit in more different characters. Also, I will do some variations in UI elements for different characters to make the project more interesting.

As you can see from the picture above, the left shows how my UI pattern will be, and the picture on the right side will be the Font style I will use. Combined means that, the overall art style will be a handwriting style or picture overlay texture with solid color background behind the text to indicate which button you are choosing.

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The overall UI style will be clean and easy to read but also add some Asian handwriting style and elements into the general UI design.

**Basic Menu Flow**
Risks:

- Character modeling might eat up most of my time which is not my focus.
- There might not be enough time for VFX implementation and refining.
- UI system is new to me in the unreal engine.

Risk Mitigation:

- Scope the concept wisely, don’t design too complicated details, and make the design simple but distinguished. Also, find a good reference for the character modeling style, be clear about the style I’m doing, stick to the style, and don’t waste too much time on things that is not worthy.
- Analyze the VFX in every detail and try to achieve it in unreal as early as possible so that I can have enough time for refinement.
- get enough practice before putting stuff into unreal.

### PRODUCTION

### PROTOTYPE

**DESCRIPTION**

*Why is your Prototype what it is?*

**SCHEDULING / PLANNING**

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<th>WEEK</th>
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| 1    | 1. Figuring out the name of the characters -2  
     | 2. Getting references for the main character and the ghost 1 -2  
     | 3. Getting idea references for the main character -2  
     | 4. List out key design points for the main character -1  
     | 5. Settle down the basic style direction of the project. -3  
     | 6. Finish the menu flow -2  
     | 7. Add reference or wireframe draw over to each menu -2 |
| 2    | 1. Refine the silhouette of the “myth manipulator.” -5  
     | 2. Refine line drawing -3  
     | 3. Start drawing detailed character concepts. -3  
     | 4. Analyzing the UI reference -2 |
| 3 | 1. Designing detailed line sketches of the choice -2  
   2. Send the finished sketches for feedback and start figuring out the color pattern -1  
   3. Refining the character designs -3  
   4. Start scripting different ghost entry animation -2  
   5. Start the basic storyboard for different ghosts -1  
   6. Refine the menu flow with the new idea, refine the character selection menu specifically -2 |
|---|---|
| 4 | 1. Finish the high poly of the main character and start low poly topo. — 6  
   2. Start proxy blocking out the ghost model. — 5  
   3. Refining the other two designs of the ghost. — 3  
   4. Set up key poses for ghost interaction animations. — 4  
   5. Finishing the Menu demo in XD or Figma. — 2  
   6. Start refining the detailed UI design and menu transitions — 3 |
| 5 | 1. Refine the silhouette and survey — 4  
   2. Have a meeting with Leon and figure out how to make a cloth model — 1  
   3. Analyze the survey and make the final decision for the character — 1  
   4. Do some cloth testing in MD or Zbrush. — 3  
   5. Refine the two storyboard — 2  
   6. Figure out the final spirit. — 1  
   7. Test some of the effects in unreal — 2  
   8. Refine the menu detail in PSD — 1 |
| 6 | 1. Analyze the survey data — 1  
   2. Send the summary to the advisor and finalize the character — 3  
   3. Refine the details of the finalized character along with the spirit idea. — 6  
   4. Test fire effect in unreal — 1  
   5. Test the smoke effect in unreal — 1  
   6. Design the button pattern — 2 |
| 7 | Prototype - MIDTERM PRESENTATION – TBD  
   1. |
| 8 | 1. Adjust the schedule if necessary. — 3  
   2. Adjust the main character according to the feedback from the prototype. — 5  
   3. Finish the low poly of the first ghost concept and start sculpting the second ghost model— 4  
   4. Refine some base VFX. — 5  
   5. Making new idle animation key poses. — 3  
   6. Refine some interaction animations. — 2  
   7. Refine the UI level setup, and adjust the camera movement timing. — 4 |
| 9 | 1. Rig the main character. — 3  
   2. Refine the texture of the main character. — 4  
   3. Rig the first ghost concept. — 5  
   4. Start the texture of the first ghost model and finish the high poly of the second ghost. — 3  
   5. Finalized the basic UI elements and imported them into Unreal Engine. — 3 |
| 10 | 1. Convert the animation from Manny to the main character. — 2  
   2. Solve issues that happened while converting animations. — 1  
   3. Get feedback and refine the texture of the first ghost. — 3  
   4. Finished the Rig of the first ghost model and converted the animation to the new model — 3  
   5. Get feedback and finish the high poly of the second ghost and start the low poly — 4 |
### METHODOLOGIES

#### Character Concept:

In the first week of the semester, I started to work on my first character concept which is also the main character of my project “Myth manipulator”, my original idea is that he can summon many ghosts from Asian mythologies, so I write down the keyword of this character as “mysterious”, “unisex(neutral)” “traditional culturally based costume”. After I wrote down these keywords, I started to look for references that are based on” Asian cultural” “Chinese traditional costume” etc. Then, I started to silhouette out different shapes of how this character might be like:
I sent the silhouette to the advisor and we picked some ideas we both liked which is this one.

Based on this concept silhouette, I started to sketch out a more detailed line art.
After communicating with my professor, I started to draw the detailed design of the three costumes that we liked the most. I started to look for more specific references that fit my concept.
And this is the final 9 sketches I have, trying to get a basic feel about what each one might look like. To avoid the distraction of the lines. I hid them and used black, white, and grey to detail out the character.
With this detailed light and shadow concept, I could apply the color to it and figure out the color pattern. My final 9 concepts start from three different specific cultures which are Chinese traditional culture, European nomadic people, and Chinese west ethnic group style. So, I started to analyze the color of different cultures. I’m mainly focused on getting what is the most unique color of this style and what is the general color pattern of this style.
To get a unique color pattern, I decided I needed to figure out why is this culture color special, so I scaled the pictures into a small size and then sneezed my eyes to find out which color caught my eyes the first, those colors are the main point that catches my eyes.

And then, I try to find the color that is used most frequently or as the main base color to support the key colors.

Based on those two color analyses, I figured out a basic color pattern as a starting point to start my color explorations.
After I get a general about different color patterns, I started to apply the color to the black-and-white concept. In this stage, I can also find out which character I can get most creative about and which concept looks cool I don’t feel passionate about it.

After talking with my professor, we made the choice about the final character. Also, we made a pivot to scope down the concept idea. Among all the cultures I mentioned above, their traditional costume all has some
unique and complicated pattern designs on them. Different patterns will make a big difference in the feeling of a character, so I started to detail out the pattern of the concept and figure out some color patterns for each character. Considering the fact that I also chose user experience as my mastery, I decided to make a survey about my final character choice.

According to the survey I finished. 6 people voted for concept A as rank #1 (3 students and 3 faculties), and 5 people voted for concept B as rank #1 (1 faculty and 4 students). 3 people for concept C and none for concept D. The interesting thing I found is that, if I focus on rank #1 then concept A got one more vote than concept B, but only two people voted concept A as rank #2 while 7 people voted concept B as rank #2 which I think should be taken into considerations.

At the same time, a lot of feedback I got from the last questions indicates that many people thought it would be more interesting to combine different parts together as the final character instead of just getting rid of all the other concepts. So, among all the feedback, there are a lot of people who like the head design of concept A and concept C, while many people think concept B is better at overall shape and potential functionality. And that’s the direction I’m trying to apply to my final character.
Figure 44 finalized concept draft

Figure 45 Cloth references
This is the finalized character concept draft with one ghost finalized design. The overall silhouette is based on concept A, while I make some adjustments on the sleeve part for functionality. I kept the mask design and detailed the mask into a Chinese traditional lion shape. I finished the fire spirit, which is also the attacking ghost, since it is for attack use, I want it to be more aggressive. So, I add a lot of sharp edges to the silhouette and the facial expression will be more vicious and cockier.
This is the silhouette exploration for three spirits. The fire spirit is finalized, I will finish the other two concepts in vertical slices.

The unique part of these styles I found is that the four concepts are all heavily based on cloth textures and cloth overlays. A new question came out: how am I going to model those clothes? One way is to sculpt everything in Zbrush, and the other way is to simulate the basic shape in other software that is used for the fashion industry, and then exported to Zbrush to sculpt details.

![Figure 48 MD practice](image)

This is the test simulation in MD I did, after 3 hours of learning, I understood the basic logic of how things worked in this software, and also I realized that I needed to do some extra research to understand the cloth design fundamentals.

I will take the T-shirt as an example.

![Figure 49 MD practice](image)

If I just take a rectangle as the sleeve, the result will be really weird, and it doesn’t look like a T-shirt. After searching for solutions, I found out that the pattern of the T-shirt sleeve is not a perfect rectangle.
This is a good sleeve pattern should look like. So, to make the cloth simulation easier, I need to search for the pattern of the cloth I’m making first, do some research, and then start making an actual model in MD.

Dynamic FX:
To figure out my dynamic effect for each concept. I need to know what’s the special characteristics of each spirit. So, I give them different labels: “attack” for Fire, “Defense” for Rock, and “Heal” for plant. After I get the keyword for each concept, I can start drawing a storyboard of each special showing-up animation.
This is my concept storyboard for the fire show-up animation. The character will throw the amulet into the sky and then the amulet will get burnt on fire, the fire will expand to the character and then, the fire spirit will show up. The fire explosion will shock the environmental object.

The logic of this is to add a force when the explosion happens. The level blueprint for the Explosion effect
This is the storyboard for the healing spirit. The character will throw the amulet to the front and then a flower will show up, wrap the character, and then explode into small particles. And the place where these particles landed will bloom a flower.

To make this effect work, the logic is that, given the particle a collision. When the particle collides, gives out an event, and kills the particle, the other particle receives the effect and then starts functioning.
This is the storyboard for the rock animation.

UI/UX Design:

To start with, I first came out with a menu flow that includes everything I need to include in the game.

And then I use the “Concept” app on my iPad and sketch out my ideas for each menu and the basic ideas of menu transitions.
After the basic layout was settled, I moved on to Adobe XD, a software to make UI prototypes. I used the default text and basic shapes like a box or circle to block out the areas.

After the first version of the menu flow was done, I started getting user feedback from different users, and I got the feedback that the concept showcase shouldn’t be in the character selection menu. Like Resident Evil 4 Remake. Feedback suggested that I add a gallery section in the main menu which will lead to the “Concept” and “Model” showcase separately which makes more sense.
After the menu flow is settled. I started to design some actual designs using photos, it is still placeholder, but more detailed and specific.
At this stage, aside from the menu flow itself, I also need to figure out what specific information will each menu give to the player. Also, I need to start figuring out the button type and color pattern of the menu.

And I put the picture placeholder into Adobe XD to make a more visualized demo for the presentation.

But the functions in Adobe XD are limited and instead of trying to achieve effects in XD, which will waste plenty of time learning the techniques, I will visualize the transitions and button pattern animation in Aftereffects. There are two reasons for choosing this, one is Aftereffects is more powerful in making video visual demos and the second is that I’m more specialized in AE.

My idea of the menu is happening in 3d space, and the switching of each menu is based on the camera movement. So, I need to test how that will work in unreal. I set up a basic level.
Figure 63 Target movement

Figure 64 unreal level set up
The logic of the camera movement is that you set up an actor with a camera and a UI widget. You duplicate it and make them different menus. Put them in the 3d level and get different camera locations, and when players click a specific button, the game will show that menu and auto generate the animation between different cameras.
The logic of the plane movement is that you make an actor with a plane static and spline, when the player clicks a specific button, unreal will get the location of a spline point A and spline point B, and it will move the
plane from A to B, but it is happened immediately. To solve this, we need to add a timeline for the transition spline and then set the animation time.

**VERTICAL SLICE**

**DESCRIPTION**

*Why is your VS what it is?*

**SCHEDULING / PLANNING**

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| 2    | 6. Refine the silhouette of the “myth manipulator.” -5  
7. Refine line drawing -3  
8. Start drawing detailed character concepts. -3  
9. Analyzing the UI reference -2  
10. Refine the UI demo in XD -2 |
| 3    | 7. Designing detailed line sketches of the choice -2  
8. Send the finished sketches for feedback and start figuring out the color pattern -1  
9. Refining the character designs -3  
10. Start scripting different ghost entry animation -2  
11. Start the basic storyboard for different ghosts -1  
12. Refine the menu flow with the new idea, refine the character selection menu specifically -2 |
| 4    | 7. Finish the high poly of the main character and start low poly topo.—6  
8. Start proxy blocking out the ghost model.—5  
9. Refining the other two designs of the ghost.—3  
10. Set up key poses for ghost interaction animations.—4  
11. Finishing the Menu demo in XD or Figma. —2  
12. Start refining the detailed UI design and menu transitions—3 |
| 5    | 9. Refine the silhouette and survey -4  
10. Have a meeting with Leon and figure out how to make a cloth model -1  
11. Analyze the survey and make the final decision for the character -1  
12. Do some cloth testing in MD or Zbrush. -3  
13. Refine the two storyboard -2  
14. Figure out the final spirit. -1  
15. Test some of the effects in unreal -2  
16. Refine the menu detail in PSD -1 |
| 6    | 7. Analyze the survey data -1  
8. Send the summary to the advisor and finalize the character -3  
9. Refine the details of the finalized character along with the spirit idea. -6  
10. Test fire effect in unreal -1  
11. Test the smoke effect in unreal -1  
12. Design the button pattern -2 |
## Prototype - MIDTERM PRESENTATION – TBD

2.

| 8 | Adjust the schedule if necessary. --3  
|   | Adjust the main character according to the feedback from the prototype.--5  
|   | Finish the low poly of the first ghost concept and start sculpting the second ghost model--4  
|   | Refine some base VFX.--5  
|   | Making new idle animation key poses. --3  
|   | Refine some interaction animations.--2  
|   | Refine the UI level setup, and adjust the camera movement timing.--4 |

| 9 | Rig the main character. --3  
|   | Refine the texture of the main character. --4  
|   | Rig the first ghost concept.--5  
|   | Start the texture of the first ghost model and finish the high poly of the second ghost.--3  
|   | Finalized the basic UI elements and imported them into Unreal Engine.--3 |

| 10 | Convert the animation from Manny to the main character. --2  
|    | Solve issues that happened while converting animations. --1  
|    | Get feedback and refine the texture of the first ghost.--3  
|    | Finished the Rig of the first ghost model and converted the animation to the new model--3  
|    | Get feedback and finish the high poly of the second ghost and start the low poly--4  
|    | Start the proxy of the third ghost.--3  
|    | Replacing the UI elements at the UI level.--2 |

### Start of the Vertical Slice

4. One finished rigged main character with basic animation and imported into Unreal engine check in with professor.--3  
5. One finished rigged ghost with interaction with the main character and with rough VFX included check-in with the professor.--4  
6. Each menu is set up, making sure the flow from the main menu to the character select screen is working. --5  

| 12 | Refine the Character texturing using a higher resolution texture. --3  
|    | Start the high poly of the third ghost model.--6  
|    | Finished the low poly and baking of the second ghost model.--3  
|    | Designing the variations of UI elements to fit different ghost styles.--2  
|    | Refining the VFX of the first ghost--4  
|    | Refining the animation using the actual model--3 |

### Critical Reviews

5. Finish the high poly of the character – 8  
6. Finish the low poly of the character – 4  
7. Test out the cloth simulation -3  
8. Refine the ui level layout – 3  

| 14 | Design UI material – 3  
|    | Apply the fire effect on the character – 3  
|    | Refine the texture of the character – 2  
|    | Rig the character – 3  
|    | Refine the character concept -3 |
5. Finish the character layout – 5
6. Refine the fire effect – 3
7. Refine the UI level in unreal -5
8. Fix some UI widget issues in unreal blueprint - 5

### Vertical Slice - FINAL – PRESENTATION

4. One fully rigged main character and one fully rigged ghost character
5. Characters and animation imported into UE5 with dynamic FX in animation.
6. Menu flow set up fully in UE level

### METHODOLOGIES

**Character Concept:**

After the prototype, I got feedback from my advisor that I went too far from the original design which looks like a new design compared to the result from the survey. I need to go back to my original design and design again.

![Character Concept](Figure 69 Finalized character concept)

After another week of refining and finalizing the concept, this is the final draft of my character. I tried my best to keep the silhouette and overall cloth while adding a more interesting design to it.
I tried to keep the cloth design clear without getting too complicated. I used different colors to make the cloth overlay clearer to people so I can get a better idea when it comes to modeling.

Also, after the final character concept was settled, I started to work on designing the spirit concepts, I’m trying to make the spirit have more connection and interaction with the character itself. I figured out that the material could have some variations along with the spirit changing. There could be some extra pieces growing from the character to make each spirit more distinctive from the other.
My original plan was to try to keep the cloth pattern as accurate as possible. However, I found that the time I spend on finding the pattern and making adjustment in Marvelous Design is not very much worth spending. It is okay to not follow the accurate pattern as long as the results fit the concept, I’m going to make adjustments in zBrush anyway.
After I got the basic shape and cloth simulation in Marvelous Design, I started to export them into zBrush and started sculpting the details and making the cloth fit my actual character.

The final draft of the cloth simulation layout in Marvelous Designer. After this, I need to import the file into Zbrush and sculpt the detail or adjust the overall shape to fit my actual body shape.
But in my first attempt at sculpting the character, it didn’t end up looking nice because of the lack of experience in character sculpting. I had to adjust again and again or even redo some parts of the character to get the best result.

While making the cloth, I used a method which is that you selected a specific part of the object as a mask and then made it as a polygroup. Then I can go to Geometry-Edge Loop-Panel Loops to extrude the face out which will also smooth the edge part. Additionally, I can also go to deformation-polish by features/groups to get a better result.
I used this method to make many pieces and after everything was done. I started to make lowpoly of my model.

I chose MAYA to retopo my character model because I already used MAYA before making lowpoly for many times, so instead of learning new software, I can save some time for later.

In order to retopo in MAYA, I need to select the highpoly and make it live on the top panel. Then you can select quad draw and draw lowpoly on the highpoly.
This is the result of the low poly.

![Image of low poly model](image1)

**Figure 81 UV**

The UV of the character.

![Image of UV layout](image2)

**Figure 82 texturing**

I send the file to Substance Painter and start baking and texturing the basic texture.

Meanwhile, I was also rigging my mesh in MAYA, I separated the cloth pieces and just focused on the body mesh because I’m going to apply the cloth simulation to my sleeves in Unreal, so I just need to paint the weight of the cloth that is close attach to the body mesh.
After the character is basically set up in MAYA, I import the skeleton mesh into Unreal and start applying the cloth simulation onto the sleeves.

In Unreal, you can choose specific material meshes and then paint the weight of the parts you want to apply cloth simulation on. You can also adjust some parameters so that it can simulate different fabrics. After you paint the value, you can apply the cloth simulation data to it. So it will automatically generate simulation data in every skeleton meshes in the level.

And the same to the fire spirit.
One thing to note about is that, since character modeling is not my mastery. I need to spend most of my time to polish the my three masteries so I decided not to replicate all the details in my concept when I was making the model and just to keep the basic key design elements so that I can save time for the things that matters more.

Dynamic FX:
My feedback from the Prototype says that it’s not dynamic enough. I need to find a way to let the FX interact more with the character itself.

For the animation, I tried two ways, one is keyframe animation, and one is through AI motion cap animation.

I used the Move One app to capture my movement through my phone and retarget it to the manny from unreal, but there are some skeleton issues like the orientation is wrong. So I need to add extra animation layers on top of the motion cap to fix that. Overall, this is much faster than keyframing the whole animation.
For the material, I tried to overlay another material on the original mesh, which is not hard.
Then, I made a little orbit flying test on the character. At first, it was fixed around the character, the path is a fixed path no matter how the character moves. Then, I tried to bind the Niagara effect to a socket which is under the hierarchy of the pelvis, then the path will change according to the movement of the character's pelvis bones.
I also did the effect that there are some particles falling down from the character mesh, but at first, the skeleton mesh effect is fixed to the default pose regardless of how the character moves.

Then I figured out that there is an option in the Niagara system that you need to switch.
Then the effect will function correctly.

To achieve the character, the show-up effect is unreal. There are a few questions I need to figure out before implementing the effect in the level: 1. How to combine the effect with the animation and show different effects in different stages. 2. How to trigger the animation with different UI buttons and how to apply the material changes as well.
Firstly, in the animation assets, there is a Notify panel where you can apply different elements to the animation like Niagara effects or other particle systems. So that is the solution to the first question. I need to make a list of all the different stages and what effect needs to be shown in different stages.

Secondly, to play different animations, I need to write a character blueprint and an animation blueprint. In the animation blueprint, I need to create a state machine where I need to set up three basic stages: Basic idle – Show up animation – idle with other spirits. I also need to set different conditions for the blueprint to enter different stages. If the state meets the condition of the execution path, then it can transform to the next state.

After the animation state machine is set up, I need to connect the animation with the UI button.
So the logic of the UI event graphic is that when the engine transitions to this UI widget. Get the actor of our character in the level, and then get the animation blueprint of the actor, then set specific details of this blueprint.

For example, when I click the button and set the first Boolean as true, then the state machine will recognize this signal and tell the engine to move on to the next stage which is the show-up animation. And apply the same logic to the other UI widgets and buttons.

The next function I need to achieve is that the UI button will trigger the parameter change of the material in a material instance with the timeline, since you can’t apply the timeline in the UI widgets, I have to apply the material change timeline in the actor itself.

So, in the object actor, I created a custom event and named it “dissolve happen” and added a timeline to animate the parameter change. Same as before, I need to get the actor first, then get the mesh in the actor,
and then get the material parameters, finally, I can connect the timeline to the material and animate the material.

After all the basic function is set up, I can finally apply the animation and effect to the levels.

I want to achieve the effect that particles fall from the character and collide with the surface and generating the fire effect. To achieve that, I need to Generate a collision event that detects when the particle hits the surface, and then kills the particle.

Then, I need another effect that receives the collision event and then generates specific event which is the fire flipbook.

In this case, the logic will be that, particles falling from the skeleton mesh, when it hits the surface, the engine will kill the particle, and the other effect system will receive the event and generate the effect at the same position.

The other effect I want to make is that part mesh of the body is on fire. To achieve this, I need to generate fire particles based on the skeleton mesh location, and then in the skeleton assets detail page, you can create multiple regions that can be applied to the “skeleton mesh location” in the Niagara System.
When I apply the sampling Regions to the skeleton mesh location, so there will only be that part of the mesh generating fire particles and it will be moving along with the body movement.

I also want the effect to affect the environment, so in the animation notify. I add another notify named “WindSpeed”.

So in the animation blueprint, I can get that notify and then set a different speed to the wind speed, to affect the flag in the background and the sleeve on the character.

So this is the result of the character effect:
UI/UX design:

First, I complete the menu flow in Unreal, so the project will have a complete flow from the start screen to the end screen where I can test the user feedback about the menu flow and transition. One thing I found out is that in the Adobe XD menu demo, the flow feels fine. However, with camera transitions involved, some menu transitions might feel a little bit strange. For example, between the start screen and the character screen, there is an amulet select screen. Everything feels normal in the demo but in the unreal project, this menu page feels a little bit too busy with too many camera movements involved.

So I need to get back to Adobe XD and test more variations to get the best user experience.
I also figured out the UI animation in Unreal Engine. First, I set up a basic button widget. Then I can choose the elements that I want to animate when it is on-hovered and then set the keyframe on specific sections.

You can also adjust the curve of the key frame which is the same as After Effects.
After the basic setup in Unreal is done (like characters and effects), I started to refine details according to the menu layout I had in Photoshop.

First of all, I replaced the font with a new more readable font as my basic, the previous font will be used for titles or decoration Fonts.

![Start screen](image1.png)

**Figure 108 Start screen.**

I add more elements to the splash screen and animation for the Main Title.

![Animation in UI widget](image2.png)

**Figure 109 Animation in UI widget**

I add more elements to the splash screen and animation for the Main Title.

I made some UI materials for the on-hover effect instead of just a solid transparent color. This is combined by two parts, base color and opacity mask.

![The base color for UI material](image3.png)

**Figure 110 The base color for UI material**
I have the basic color for the UI pattern so I can just animate the mask to make it look like it’s moving.

This is a mask blueprint. I put different speeds in the panner for each texture so that can result in a more interesting result, at the end of the blueprint, I put an Opacity parameter and multiply with the original mask so that I can animate the parameter to give the button material a fade in and fade out effect which looks like this:

I also refine the layout of the gallery screen:
**ALPHA**

**DESCRIPTION**

In Alpha, I need to achieve most of my feature and put everything in the engine.

**SCHEDULING / PLANNING**

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     | 2. Finish the draft of the rest characters. -3  
     | 3. Refine the fire effect -3  
     | 4. Make the storyboard of the rest spirits -5  
     | 5. Designing the detailed UI animation and refining the menu flow. -3  
     | 6. Start Font design. -3 |
| 2    | 1. Refine the main character and the fire character. -3  
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     | 3. Finalize the other two character concepts -3  
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<td>8.</td>
<td>ALPHA - MIDTERM PRESENTATION – TBD</td>
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<tr>
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<td>1. All characters are done and fully rigged with basic animation and VFX.</td>
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<td>2. All UI elements are set up correctly and interact normally.</td>
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METHODOLOGIES

Character Concept:

After the second semester began, I started to design the other two character concepts which are supposed to be defense and healing. I need to go through the whole process the same as before.

Starting from the solid silhouette of the defense concept, I set up a few keywords such as squarish, rock, stone, dry, sand, etc.

![Silhouette of the Rock](image)
After talking to the advisor, we picked some silhouettes and I started the detailed sketch drawings.

Silhouette of the heal concept.
Detailed sketches of the concept.
I communicate with my advisor about which concept we like the most.

These two are the final concepts that we chose and then I started refining the concept and working on the high poly in ZBrush as well.

After I finished the highpoly, I started to make lowpoly in MAYA.
This is the low poly of the two concepts.

Rigging set up in MAYA.

Dynamic Effect:

After the other two models and rigging are implemented into the game. I started working on the VFX for the other two concepts. For the mushroom spirit. I want the mushroom to pop out from the void. So I made the effect that particles are gathering in and eventually burst out of the mesh of the mushroom, Meanwhile, there will be the particles on the main characters as well. Then those particles will burst out and slowly fall down to the ground, the same as the fire effect, the particles that fall down to the ground will generate some kind of effects.

After I combine the effect to the character, I also add another notify that triggers the wind to blow so the flag in the background will be blown up.
This is how the effect looks like right now.

For the rock spirit, my initial idea is to have a big rock showing up and then make the hand to destroy the rock. In that situation, I did some research into the unreal Chaos system and made some effects based on that prototype.

This is what the effects look like right now.

UI/UX design:

After a refresh of the winter break, I started to have a new understanding of my whole project. So I started to refine the polish the overall UI design and page layout.
First thing first, I started to redesign the logo of my game. I want to keep it simple but also impactful to the audience. Here are some of the draft ideas I came up with when I was brainstorming myself.

The next thing I noticed is that my start screen is a little too boring. So, I started to be creative about the design and let the character pose a gesture to the camera with the text having a little angle to the camera as well.
Same thing I did to the gallery screen. I planned to have a 2d drawing illustration for the concept button and some 3d model rendering for the Model button so the player will get a clear idea about what they are about to see.

I got feedback last semester about the amulet screen being too busy, so I came up with a new layout with a more direct illustration style with some text logo design for each spirit.
Here are the two menu designs that I still need to polish and update in Unreal.

**Figure 131 Options menu set up**

For the Options menu, I used the widget switcher to change different panels.

**Figure 132 Blueprint for widget switcher**

You can put the different widgets under the Widget Switcher and it will generate an index according to the order, so in the blueprint you can assign different indexes to different buttons.

**Figure 133 Logic for the on-hover effect**
For the on-hover texture, I use a general way to assign the texture instead of putting them one by one.

![Figure 134 add blueprint.](image)

After the general setting is done, you can add each border to that texture.

![Figure 135 Confirm page](image)

One more thing I changed is to add one more page after players click the “Quit” where they will get a confirm page asking them do they really want to quit the game, which is the feedback I get from the user experience.

After all the character models are finished, I have a better understanding of how the character looks like in the game. So I started to do some twists to the design of my UI layout.

BETA

Character Conce[pt:

Meanwhile, I started finalizing the concept layout, to present the concept better, I decided to move the main concept to the center and put other information on the side so they wouldn’t be distracting.
These are the first pass of the final layout and the concept of each character.

When the first pass is done. I just began to refine the details and maybe some small parts of the design.

Dynamic FX:

I tried a lot of ways to fix the movement issue that the yellow handle not moving along with the mesh, but they all ended up failing. So I need to come up with a second plan about this effect which is getting rid of the rock movement and just respawn it on the ground. In that case, the logic will be simpler and easy to manage. So I created a Blue Print which is the rock actor itself. I set up a new BP actor which is named “Rock Manager” to trigger the rock actor to spawn at a certain location. Delete the actor when the player clicks the other amulet or clicks the back button. The rock actor is spawned on the ground so there will be no visible issue about the chaos simulation before the hand hits the rock actor.

Meanwhile, I also ran into a small problem the animation mesh actor is not showing up normally as it should be. After a few debug tests, I found out it is because the camera doesn’t capture the actor mesh so for the performance purpose the unreal set the mesh would not update as default. Knowing the reason for the issue makes the solution much clearer which is just to check the update option in the skeleton mesh “Always Tick Pose and Refresh Bones” option.
After the basic technical problems were solved, I started adding and polishing the effect. The first thing on my list is to add more unique designs to the mushroom effect. My original idea for the effect is that flowers will show up, then bloom and burst out petals and particles which will generate flowers when collide with the ground.

To achieve the flower effect, I first made a petal model in 3ds max and made a material for the glowing effect.
After I have the petal in the engine, I used the mesh renderer to render the mesh in the Niagara system. To achieve the flower look, I use the initial mesh orientation to give a randomized angle for each petal. I used “update mesh orientation” to make the petal bloom as well as rotating.

When I have the main part of the flower effect done, I just need to keep adding detail particles and play with timing to get the best result. I made some animated material to give some special aura and distortion effects.

As for the raindrops, I used the same method as the Fire which is using the collision event.
I spent a pretty long time achieving this effect because the Niagara system doesn’t support the event handler when you have animated size or color. So I had to figure out a second plan that used the material parameter and animating the parameter in the Niagara system.

This is how the flower effect looks.
And this is how it looks in the project combined with characters.

When I started refining the rock effect, I found that the rock destruction didn’t feel as visible as it should be. I decided to twist the original plan a little which was to make the rock explode instead of just putting it on the ground. To make the explosion make sense. I decided to make a rock-colliding effect that caused the explosion.

I decided to make a black hole effect to inhale the rocks and collide with an explosion. The first thing I need to do is to make a black hole ring that distort the environment.
After that, I need to make some rocks orbiting from one point and eventually gather to the center point. I used the mesh renderer to render the rock mesh and gave them a random size. I used the “Vortex Force” to give them an orbiting force. Then a curve is to change the strength value of the “Point Attraction Force” so that the rocks will gather to a point. With the main part of the effect done, I started adding details like smoking and small particles to make the effect more vivid.
And this is how the effect looks combined with other effects and the character.

When it comes to the fire head, the first thing I need to fix is the texture of the skin. Even though I use the emissive material right now, it still looks not polished. So I decided to make a different material.

I decided to go with a more lava-like material with normal animation so it feels like there are heat waves from the fire embers.
I’m also polishing the fire effect as well. Instead of just using the fire sprite, I added more layers of fire with different colors. One is the glowing fire core, one is the red fire with a bit of transparency and the bottom layer will be pure black to simulate the smoke generated by the fire. I also added a small ember around which definitely helps make the fire look more vivid.

And this is the final look of the effect.

I also tried to add some juice to the final look by adding a camera sequence.
First, you create a camera sequence in the level and animate the camera movement. You can add more elements to the sequence if you want. And in the character selection widget, you can create a level sequence player so that you can blend the movement into the sequence.

And this is the first pass of the final look of the character showcase
Figure 155 rock effect with camera

Figure 156 fire effect with camera
UI/UX:

The first thing I polished was the start screen. My character will summon three different characters so I designed three different hand gestures and made it as rotating decorations in the background. For the color pattern, I stick with the light red and light green which is a traditional color choice in ancient Asian art.
The next thing is that I want to make full use of the splash design. So I apply the red splash to the gallery menu. It also helps convey the images more clearly to the player.

After I finish the basic visual design, I need to achieve all the effects in the engine. Because I have many buttons to replace, it will be hard for me to manually put the images one by one. That’s why I need to make all the buttons modular so I can customize all the buttons.

To make the buttons modular, what you need to do is to check the box on “is variable” and it will make the image/text/material a variable. And in the widget blueprint, get the variable you just set and set the text/brush/material, where you can set the “In Text” as “promote to variable”, and check the checker box of “Instance Editable” as true. That’s how I make the modular button.
After the main button widget is done. I just applied the button to all the menus and replaced the old button.

Although I still need to make a few more widgets to have the variations, but having the button as modular still saves me a lot of time.
The next thing I polished is the Confirm page where I learned how to use the retainer box. So the retainer box is a tool that works as an alpha mask. Unreal will render the information inside of the box but only display the area that has the mask of the retainer box. To set the alpha mask, you need to make a custom material for the retainer box.

![Figure 164 material for the retainer box](image)

The material should be just a black-and-white texture with alpha information on it. And the node you need is “Final color” and “Opacity”. With this setup, you can achieve many mask animations in Unreal. For example, I just animated the image in the retainer box which adds so much juicy to the menu transition.

![Figure 165 animated image moving](image)

You can also get some material parameters in the retainer box material to get more interesting results.

![Figure 166 customized material for dissolving effect](image)
This is a material I made. It used two different waves to generate a dissolve effect. I applied it to my original texture so I got the effect to look like the picture below:

![Figure 167 animated material](image)

Then I can create a Material Parameter Collection and add a new scalar named the same as the parameter that I want to animate.

![Figure 168 how to animate material parameter](image)

And then, in the widget animation. I can add these parameter collections and set different keyframes to change the value.

![Figure 169 effect preview](image)

This is how it looks like:
And this is where I used it in the game:

**CONCLUSION**

**RTM**

**Character concept:**

The main focus is still on the dynamic FX and the UI/UX design. For the concept, what I did was mainly polish the layout and add more sketches to show more details.

Here is the final pass of the character concept sheet.

![Figure 170 in game effect preview](image)

![Figure 171 Final pass of the concept sheet](image)
Dynamic FX:

Still, there are many issues with the scene right now, for example, the asset in the background is just solid color and at a certain angle, it will cover the effect with translucency due to some unreal problems. After debating the time and the effort, I decided to get rid of the environment and use some effect to fill in the background.

I got some feedback from the advisors that after the animation and the effect is over I can move the camera forward to give a closer shot of the character and the spirit which could show more details I put in the character. This is different from my original plan where the character showcase will be and there will be some extra work for me to figure out a new shot but I also agree that a closer shot can help me solve a lot more problems so I decided to go with that.

I start picturing close-up shots for those characters using some really simple draft just to get a basic idea and move on to the Unreal sequence immediately to test out because I don’t have that much time for planning. Testing out stuff in unreal directly can help in this situation.

![Figure 172 draft of the character close-up shot](image)

I just make full use of my previous draft assets and animation assets so that I don’t have to spend that much time on making something new that won’t be in the game. I draft out these line sketches in 10 minutes and move on to unreal for testing. I have to make many adjustments and compromises to the character skinning, but I still get a pretty decent result about how the shot came out:

![Figure 173 close-up shot of the different character](image)
Then, I moved on to polishing the camera movement because the feedback about the camera sequence was that it was moving too fast. So, I simplify the movement and try to get a more cinematic sequence to better showcase my character. I did some refinement on the character animation as well as a simple camera animation in MAYA and matched the camera sequence in unreal. I had some previous experience in my undergraduate about cinematic animation in unreal so I got this animation and camera done in less than a day. And it comes out pretty well, which I’m pretty satisfied with:

![Figure 174 MAYA sequence draft](image1)

**Figure 174 MAYA sequence draft**

![Figure 175 Camera sequence in unreal](image2)

**Figure 175 Camera sequence in unreal**

When I get a pretty good result of the camera sequence, I started to polish the effect to match the timing and camera angle. Since I already had a lot of effects before, it didn’t take much time to get the effect I wanted. I just combined different particles and the Niagara effect together and switched the colors and other stuff.
This is the result including the close-up shot.
UI/UX design:

The basic functionality is all set up in an unreal level. What I’m planning to do in RTM will just be polishing the customized assets with different renderings and different illustrations.

One feedback I get is that when you are choosing the amulet, the design doesn’t really convey the player what each amulet is and what personality is, and instead of using the customized illustration, I should just render some high resolution screenshots with different poses which can save a big amount of time for me. So I set up a new level. Build a little rendering studio in the scene. And used the assets I made before to get some screen shot. I did a little polish and color correction in Photoshop and replace the old images in that menu widget.

![chosen amulet](image)

Figure 177 refined character selection menu.

I also refined the on-hover animation. Before, the amulet was just a small element at the bottom of the menu and will be brighter only if you on-hover the cursor on it. I made the default state big and covered the screen more than before. It will turn smaller and move to the side when you on-hover the mouse, meanwhile, a high-quality render will show up and tell the player what personality that spirit has. Which I think definitely communicates with the player better than before.
I took some other screenshots for each character separately for some other menus like gallery.

Here are the screenshots I had, and I combined them in Photoshop.

Figure 178 refined start screen

Figure 179 refined gallery menu

Figure 180 the problem of the text cutting the character.
I get the feedback that it feels weird when you rotate the character but the text isn’t hiding and it’s cutting the character’s feet off, which isn’t a good user experience for the player to see the character.

I polished the camera position to showcase the characters better. And add some more elements to get a better UX for player.
I also finalized the credits menu.

Optimization:

For frame rate optimization, I didn’t run into serious issues of frame rate drop down to below 30, but I do have some moments that the frame rate drop down. Here is the situation when the frame rate would drop: a. When the unreal is playing the fire sequence and the fire effect starts playing, the frame rate will drop down to below 40. b. When the unreal is playing rock sequence, where the chaos destruction happens, the frame rate will drop down to below 40.

Other than those situations, the frame rate is usually fine. So I spend most of my efforts on optimizing those scenes. For the fire sequence, I figured out it is because I put a light renderer in the Niagara sequence along with the fire UV sprite renderer which generates 500 sprites in the effect. The frame rate will stay constantly at 60 when I turn it off. But I still need the character to have the emissive effect. So I added another Niagara effect to the character which will render 10 sprites and no sub-UV animation. Where
I put the light render in the effect and increase the visibility and intensity to let the character light up the scene. It works pretty well since the frame rate doesn’t drop while maintaining emissive effect.

The next thing I need to solve is the frame drop of the chaos system. Where I just replaced the original mesh with a new mesh which has a lower level of chaos destruction. It helps with the frame rate but the little bricks will have fewer details because it has a lower level of destruction. But the result doesn’t have that much big difference so I decided to keep this as my solution.

![Image](image1.png)

Figure 185 Quad draw view of the scene.

![Image](image2.png)

Figure 186 shader complexity.

When it comes to shader complexity, overall everything looks fine with green or slightly red. But, when the camera goes to the effect showcase area where Niagara systems play at the same time will cause the image to go to pure white, which is a big issue I need to fix.
The reason that the shader complexity goes to white is because translucency material eats up a lot of the performance, even if they are fully translucent, they will still render the whole image. So the first thing I did was changing the translucence material for the fire flame flipbook.

I changed the material type to masked, which will cause a hard edge on the translucent part and that looks quite terrible. I found a node called “dither” and that could faking a smooth transition by spreading out the dot, which is similar to the technique in printing old posters or manga.
This helps so much with the performance because it renders the flip without rendering out the full image. But this only works for those small sprites and particles, when you scale the effect big enough then the player will immediately notice the dots and the depth will be rendered in a wrong way. So I need to figure out a new way for other effects like smoke.

One thing I used is a “Cutout” function in the Niagara system, it detects the translucency of an image and cuts out the edges that are lower than a specific percentage, it’s not the best solution but it helps to avoid too much overlapping renders.
For the textures, you can apply your customized mask on it to help the unreal engine to detect the translucency, and the Alpha threshold plays as a threshold where it sets a bar for the translucency.

After testing different threshold parameters, I think 0.1-0.2 could keep the shape best while helping a little with the shader complexity.

The next thing that helps is to decrease the amount of the spawn rate while adjusting the sprite size to keep the effect good-looking. Also having them separate as soon as possible is also a good way to avoid white areas in the shader complexity.
After I refined the Niagara performance, I tested out that the frame rate could stay stable at 50-60 fps at any scene. So I didn’t make big adjustments on the material aspect. All the textures are in 2K resolutions and I make some minor textures to 1k and some to 512. And it did help a little with the frame rate. Since my scene was relatively smaller, and there wasn’t much setup for the environment, I decided to leave it as it is.

CONCLUSION

MASTERY PILLAR 1: CHARACTER CONCEPT - RETROSPECTIVE

What Went Well:

1. I followed the proper pipeline which really helped me design the character better.
2. I can keep all the processes and put those into my final layout which enriches the detail of the character.
3. I manage my time well when producing the concept which is to spend enough time exploring the variations but also quickly polish the detail when making the decision.

What Went Wrong:

1. I ran into the issue of having some bias and a favorite on one concept choice when I sent out the survey, which led to some waste of time in finalizing the concept.
2. When it comes to Alpha, I know I’m short of time so I try to skip some parts of the pipeline but I ended up spending more time fixing issues.

What Was Learned:

1. The proper pipeline in the industry and the consequences when you don’t follow the pipeline properly.
2. How to get people’s feedback and apply those feedback to the concept.
3. Overall drawing skills and design skills including reference gathering and analyzing as well as elements breakdown.
4. The difference between “concept” and “drawing”: “Concept” will be focused more on the demonstrating the element details of a character, which means it is more important to reveal all the detail design as much as possible and accuracy more than good-looking, while drawing will focus more on the appearance of the final composition, which means that the shadow and highlight while the brush details are used to help developing a better-looking image.
Even Better If:

1. I could go crazier about the design while I was doing silhouette, I felt limited because I knew I needed to model it myself, so I sometimes get hesitated about designs because I’m afraid that it would cause more trouble in the modeling stage.
2. There are still some parts of the design that I think could do better as I do deeper research on the reference.

MASTERY PILLAR 2: UI/UX - RETROSPECTIVE

What Went Well:

1. I followed the proper pipeline of UI/UX design which make me more professional.
2. I achieved many animation effect ideas from my visual guild from AE to Unreal Engine.
3. I was able to prioritize the time for more important stuff while having enough time to polish all the details in unreal.

What Went Wrong:

1. I was trapped in my initial idea of the prototype and didn’t think outside of the box to get a better result.
2. I left some technical attempts too late to achieve which became a block when I was trying to finalize the UI design

What Was Learned:

1. The proper pipeline in the industry.
2. Blueprint set up and modular button technique in unreal.
3. Learned the technique of UI material.

Even Better If:

1. I could spend more time on polish more details of the UI design, exploring more variations and background composition graphic design.
2. Explore more about the 2d and 3d menu design. I came up with a new idea of combining more 2d elements in the 3d environment but it was in the late stage of production, so I have to let it go for the defense.

MASTERY PILLAR 3: DYNAMIC FX - RETROSPECTIVE

What Went Well:

1. Successfully made different types of effects in the Niagara system.
2. Able to polish the effect in a short amount of time

What Went Wrong:
1. Leaving the effect in the late stage of production.
2. The scope is too big in the pre-production.

What Was Learned:
1. Understood the Niagara system more.
2. Learned more basic logic in Niagara and how to connect with other systems.
3. Learned some technic about material animation.
4. Despite all the knowledge and results, I learned that visual effect is not my thing.

Even Better If:
1. I could start designing the effect earlier than what I was now.
2. Did more research on the Niagara on what’s dynamic and what’s practical.

ARTIFACT - RETROSPECTIVE
What Went Well:
1. Successfully finished the project in time with enough polishment.
2. Have a good vision about all the things I have to do and was able to get rid of some less important features.
3. Be able to figure out a better plan when I’m trapped in the box.

What Went Wrong:
1. Scope too big at the beginning leading to a hard time starting the project.
2. Didn’t fully understand what dynamic effect is leading to time wasted on correcting the mistakes.
3. Adding too many new things, meaning that I’m still doing prototypes while polishing.

What Was Learned:
1. Time management about prioritizing tasks according to the importance and relevance to my masteries.
2. Ability to stay calm under pressure and figure out the best solutions.
3. Learned about being a generalist

Even Better If:
1. Figure out a better way to showcase the artifact without too much extra work.
2. Manage the time more wisely about stop focusing too much on details and keep the big picture in my mind always.
3. The artifact could be polished more if I could start with masteries that isn’t spread in such dynamic range.

WHY IS THIS MASTERY
I chose these masteries because I want to be a UI/UX artist, and that’s why I placed my main focus on UI/UX design. I also need a game idea to support my UI/UX design, I thought I could design different characters for players to choose from, so I chose my
second mastery as character concept design. Finally, I believe having dynamic effects involved with character could enhance the look of the project as well as demonstrate the personality of my character. And that’s how I decided on those three masteries.

The first takeaway I got from the project was that I have a better understanding of the UMG system in unreal in terms of both design aspects to the technical setup. Meanwhile, my project covered the initial concept to the final in-engine setup, which made me a generalist who had experience in all the roles in the game art pipeline. I had a deeper understanding of the pipeline and could use this experience to contribute to the industry.

If I have the chance, I would like to add more details to the environment and add more animations

I would suggest to future graduates that it’s very important to thoughtfully think about what you are going to deliver and how much extra work you need to do that’s not your mastery. If you have to do things that are not your mastery, try to decrease that part as little as possible and just focus more on your masteries.

PERSONAL GROWTH

My personal growth would be that I can proudly say that I’m a UI/UX artist as well as saying that I’m a generalist. I get better about time management, the ability to resist pressure, and the ability to respond quickly in an emergency when something goes wrong. In terms of technical knowledge, I believe I have a much deeper understanding of the whole pipeline of the game art pipeline. I had the chance to practice each role in the game industry. It’s definitely an exhausting yet valuable experience for me. Before, all the roles and progress felt so isolated and even with tons of research, I still don’t have a clear mind of how one thing could affect one another. This project connects all my separate knowledge as a closed circle like a wire connecting the pearls together.

ADDITIONAL DOCUMENTS

![Asset list](image)

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