



PROJECT TITLE: ASTRAL ASHES 2.0

Submitted By

MD. YAHYA, ID: 183-35-2599

DEPARTMENT of SOFTWARE ENGINEERING

DAFFODIL INTERNATIONAL UNIVERSITY

Supervised By

Mr. Khalid Been Badruzzaman Biplob

Lecturer (Senior Scale), Department of Software Engineering

Daffodil International University

This Project Report Has Been Submitted in Fulfillment of The Requirements for The
Degree of Bachelor of Science in Software Engineering.

APPROVAL

This thesis titled on “Astral Ashes 2.0”, submitted by Md. Yahya (ID: 183-35-2599) to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to its style and contents.

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Chairman

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Head and Associate Professor

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Faculty of Science and Information Technology
Daffodil International University



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Department of Software Engineering
Faculty of Science and Information Technology
Daffodil International University




Internal Examiner 2

Khalid Been Badruzzaman Biplob

Lecturer (Senior)

Department of Software Engineering
Faculty of Science and Information Technology
Daffodil International University



External Examiner

Md. Tanvir Quader

Senior Software Engineer

Technology Team
a2i Programme

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I hereby declare that I have done this project under the supervision of Mr. Khalid Been Badruzzaman Biplob, Lecturer (Senior Scale), Department of Software Engineering, Daffodil International University. I also declare that this project is my original work for the degree of B.Sc. in Software Engineering and that neither the whole work nor any part has been submitted for another degree in this or any other university.




Md. Yahya

ID: 183-35-2599

Department of Software Engineering

Daffodil International University



Certified by:

Mr. Khalid Been Badruzzaman Biplob

Lecturer (Senior Scale), Department of Software Engineering

Daffodil International University

Dedication

Dedicating this project to Allah, for every chances he always blesses me with, for all the beliefs in people for me, for the strength of satisfying him, while living the life to the fullest, assuring Jannat.

Abstract

Astral Ashes 2.0 is an updated version of the very first built game of mine. I had this project transferred to Unreal Engine 4 from Unity, ultimately unlocking a lot of accessibilities for this version of the game. Implementing an origin story of our character “Nooh”, our game explores further through the story-telling and game-playing in a semi-realistic game environment with few mythical touches of fictions. The game is designed with numerous resources which has all been self-provided using Blender, Adobe After Effects, Adobe Audition, Adobe Illustrator, Adobe Photoshop, Adobe Substance 3D Painter, Audacity, Materialize, NVIDIA Plug-ins for Adobe Photoshop, SpeedTree, Spacescape, Visual Studio 2019, World Machine etc. It is written in Unreal C++ and we have also implemented very few Unreal Blueprint Visual Scripting.

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CHAPTER 1: INTRODUCTION

1.1 Overview

While having all the non-functional requirements enhancing the game experience for our player, our main objective is get our player to engage with the main events of the game. Our story driven environment will encourage players to proceed further through the game. Awaiting dangers, hard-hitting story and contemplation of probable events will keep our gamer entertaining for the duration of the game. Curiosity of knowing more, the eagerness of exploring has always been the defibrillator of humanity to reach beyond. That is why our game will end with scene where our gamer will not be able to explore around, a place of ominous fantasies.

1.2 Project Purpose

Purpose of our project “Astral Ashes 2.0” is to normalize the practice of our religion, our main character will stand out for representing the perfect illustration of undeniable importance of “religion being the absolute answer to all that is real and to all that can be fantasized.” Modern society has always been stepping back to the past when it comes to the fact about valuing the ethics and morals. The normalization of vulgar words, practice of religious satire, idolizing bad characters online, normalizing the practice of drug addition, unhinged decadence of decency and politeness, practice of prejudice. All of these highly demotivates religious practices amongst pious teenagers and gamers. It is a great opportunity to be able to gift them a game where they can love, respect and idolize a pious character while gaming for entertainment. Gaming is very accessible in the modern world, during a five minutes break gamers can do so many things, run through miles, enjoy story-telling hang around a charming environment and many more. Instead of denying the accessibilities and the impact gaming has in our life, we can seed the subconscious awareness which contradicts

with the concept of wasting leisure times doing nothing. Along with the concept of confident practice of religions. As it only promotes the quality of life.

1.3 Background

I am a gamer myself, I know what I like, what my communities like, how gaming industries take feedback from players, how the game mechanism works, which gaming mode is famous right now, which kind of players like which kind of games. Being familiar with the industry, while having a huge interest on programming, has made me really fond of them game developing part of the adventure.

I try to be a pious person, because I am familiar with the concept that, “whatever the rules of living has Allah decided for us is definitely the best option to live life the fullest”. I have seen people breaking rules, I have seen how they kept getting back tracked to the ancient times refusing modernization, embracing the pretense of modernity.

This is why working on this project has been very meaningful to me, attending personal interests I can relate to the point where both world overlaps.

1.4 Benefits and Beneficiaries

This game provides player with pleasant environment, origin story of the main character, ability to use features of the map, ability to collect items on the map, engage with a three to five minutes game mode of surviving, respawning system if players fail to survive, check points. Which all together makes this game an absolute option for any gamer who likes the mythical concepts, fantasy, story-telling, action, decision making.

1.5 Stakeholders

Our sole stakeholder of this project is gamer only, it is an individual experience system, which can be vastly used by as many users as possible.

1.6 Project Schedule

Considering all the tasks in hand and the times left, developing charts of planning will help us tremendously to meet the deadline.

1.6.1 Gantt Chart

Table 1.1: Gantt Chart

Activities	Wee k 1	Wee k 2	Wee k 3	Wee k 4	Wee k 5	Wee k 6	Wee k 7	Wee k 8	Wee k 9	Wee k 10	Wee k 11	Wee k 12	Wee k 13	Wee k 14	Wee k 15	Wee k 16	Wee k 17
Rework	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Story Development	+																
Game Design		+	+	+											+	+	+
Specification	+	+											+	+			
Game Development	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Testing	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Feedback					+				+	+					+		+
Additional Tasks												+	+	+	+	+	+
Final Touch													+	+			+
Game Release																	+
Documentations												+					+

1.6.2 Release Plan & Milestone

Table 1.2: Release Plan

Activities	Weeks	Total Weeks
Rework	W1 - W17	17
Story Development	W1	1
Game Design	W2, W3, W4, W15, W16, W17	6
Specification	W1, W2, W13, W14	4
Game Development	W1 - W17	17
Testing	W1 - W17	17
Feedback	W5, W9, W10, W15, W17	5
Additional Tasks	W12 – W17	6
Final Touch	W13, W14, W17	3
Game Release	W17	1
Documentations	W12, W17	2

1.7 Objectives

The main objective is to assure the little time that players spend their time in they experience something very solid, we want to ensure that they would want to come back to play this game, leaving them curious about any sequel that this game will have. We aim to make the system:

- Bug-Free: I always kept testing the game during the period of development to make it bug-free and I tend to go through it as many times as I might need to.
- Clear Instructions: Clear in game instructions to help players navigate through the game.
- Performance: We have tried to keep the game as performant as possible.
- Cost: We have decided to make the game free if we ever release the game to the market.

CHAPTER 2: REQUIREMENT ENGINEERING

2.1 Functional Requirements

Deciding the functional requirements beforehand when designing the system is has been proved very useful, it also welcomes any other functional requirements to be added later throughout the development. Astral Ashes 2.0 has listed functionalities:

- Cinematics
- Storytelling
- In-Game Instructions
- Walking Ability
- Ability to Spawn Astral Particle
- Ability to Go Through Map Portal
- Checkpoint
- Respawning
- Ability to Pick Up Ashes
- UI / HUD Showing Current Health
- Surviving Game Mode
- End of Survival Session
- Storytelling Triggers
- Death
- Astral Realm

2.2 Non-functional Requirements

Few non-functional requirements are almost as important as the functionality they are associated with, listed few important non-functional requirements below:

- Particle System
- Niagara FX
- Trigger Animation
- Idle Animation
- Foliage Movements
- Lake
- Landscape Designing
- Audio Effects Recording
- Cloud Effects
- Sky Box Designing
- Structure Designing
- Environment Designing

CHAPTER 3: SYSTEM ANALYSIS, DESIGN & SPECIFICATION

3.1 Development Model

I have been implementing “Prototype Model” for the duration of the development.

Prototype model puts developers in a position where they can seek and implement and upgrade any part of their system, even though it’s really time consuming but it ensures perfection within.

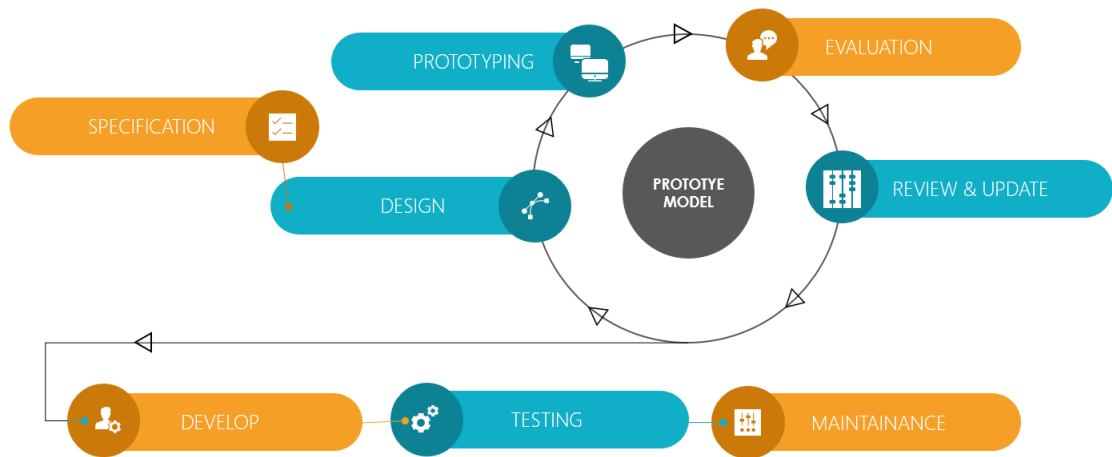


Figure 3.1: Prototype Model

3.2 Use Case Diagram

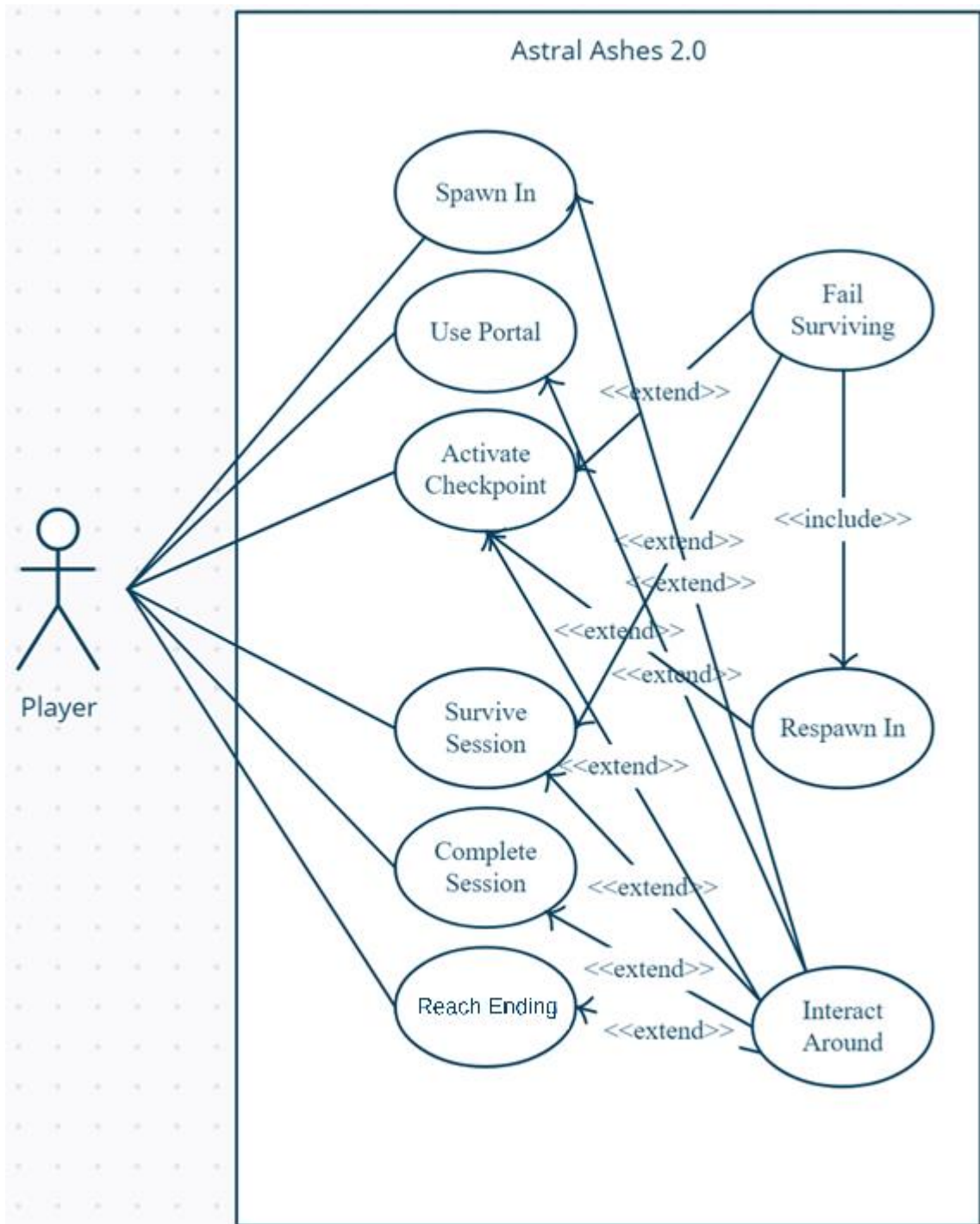


Figure 3.2: Use Case Diagram

3.2.1 Use Case Description

Spawn In

Spawning in the game at the beginning will commence any and every sequence of the game, players will spawn in the game with a story ongoing and cinematic view of actual gameplay.

Use Portal

Accessing the portal on the lake will take the character directly to the game session, even it is a portal operating on the both ends but players will be restricted from using it to get back to the previous position.

Activate Checkpoint

Using the portal will trigger a checkpoint where players will keep spawning when they die during the game session.

Surviving Session

Surviving session is the main event of the game, binding all the critical connection of the game to this event will be of a good adrenaline rush for the player.

Fail Surviving

Players will have to collect some critical supplement to survive the game mode, failing to do as instructed will decay the health of the player down so low that the character will die.

Respawning In

As this game values the importance of having fun, we have implemented the concept of respawning to the game, players when the die will respawn to a location at the start of the game session, allowing them to keep starting over till they succeed.

Complete Session

Completing the game session will allow players to see further through the game, and navigate them to the end.

Reach Ending

Reaching the end of the game, players will be presented with an environment crafted very carefully to give players all the reason to come back to the game for a sequel at a later development.

Interact Around

Players will be able to move, jump, go right, go left, reach ahead and go back. Players will all time be able to shoot a particle system enhanced energy core out of their character. Players can at any moment keep exploring the map, which during game session might prove a little tough.

3.3 Activity Diagram

Spawn In

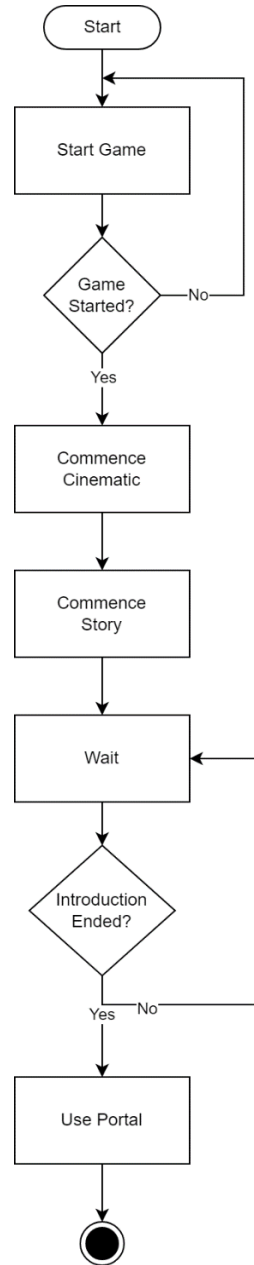


Figure 3.3: Activity Diagram Spawn In

Use Portal

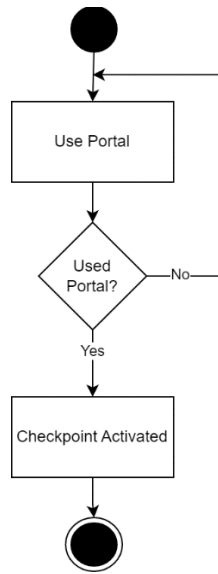


Figure 3.4: Activity Diagram Use Portal

Activate Checkpoint

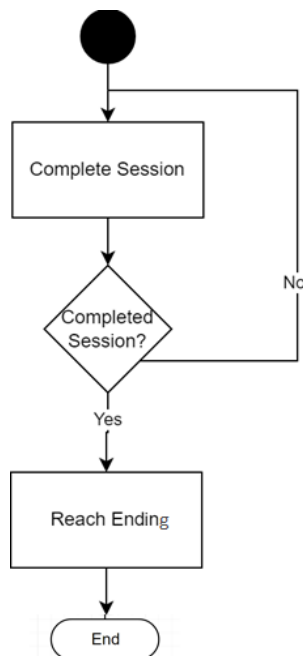


Figure 3.5: Activity Diagram Activate Checkpoint

Survive Session

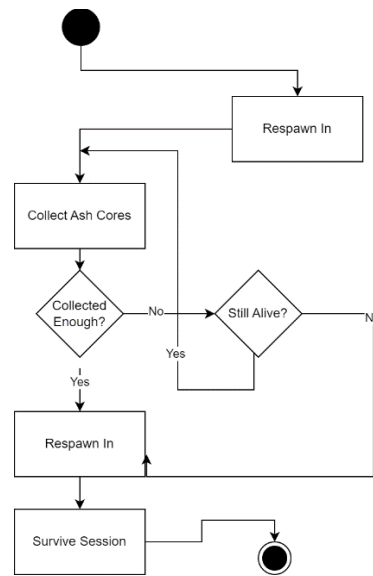


Figure 3.6: Activity Diagram Survive Session

Complete Session

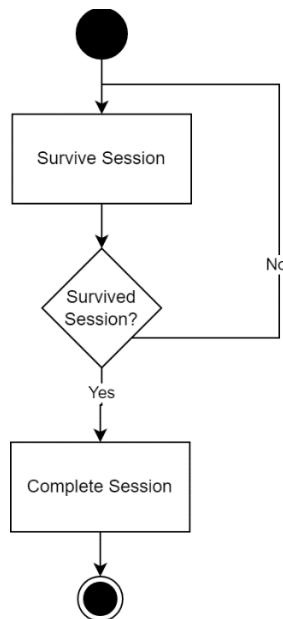


Figure 3.7: Activity Diagram Complete Session

Reach Ending

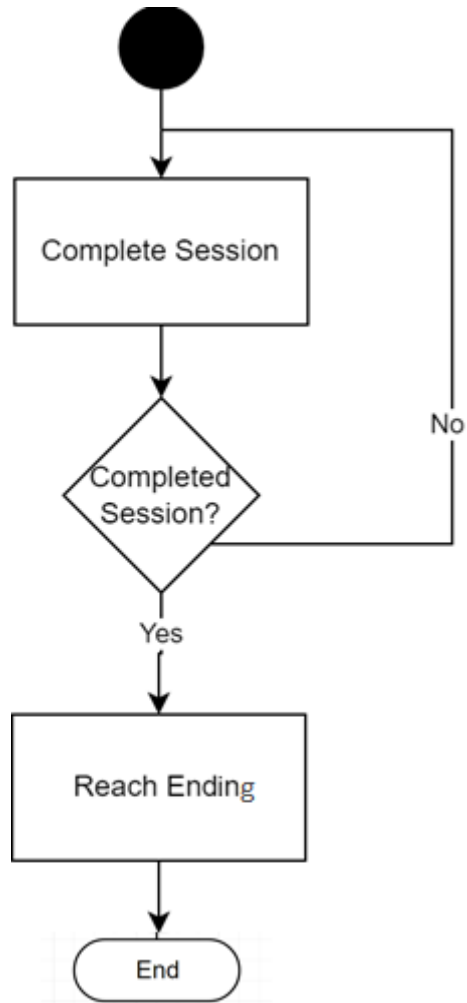


Figure 3.8: Activity Diagram Reach Ending

3.4 Sequence Diagram

Spawn In

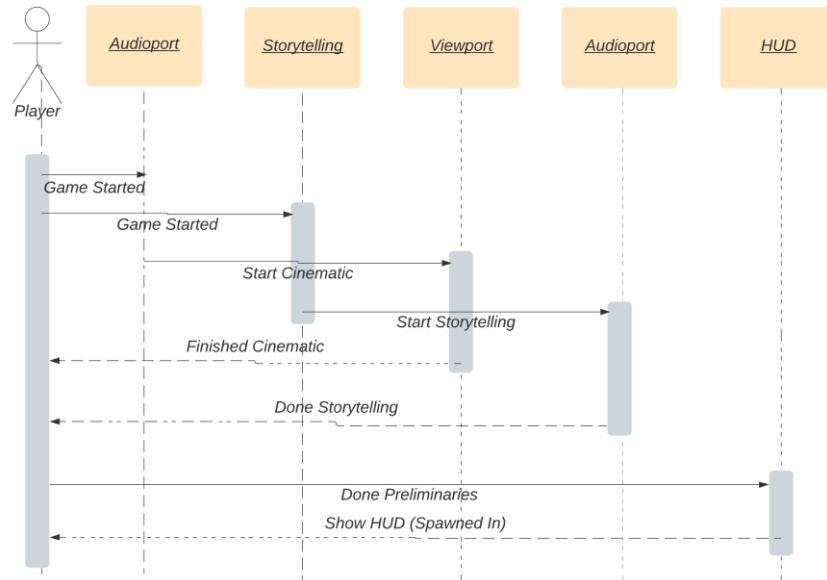


Figure 3.9: Sequence Diagram Spawn In

Activate Checkpoint

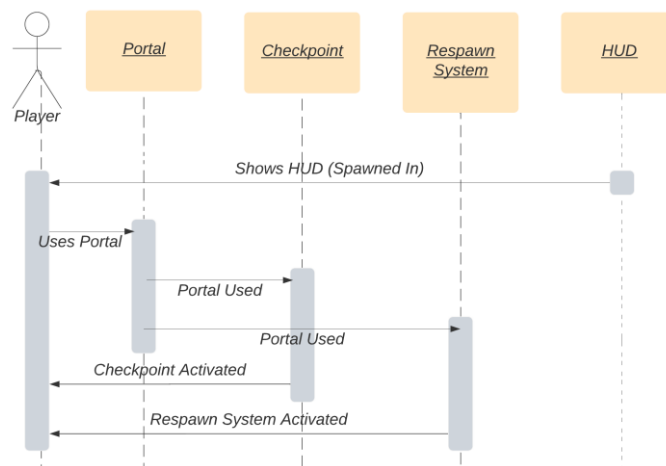


Figure 3.10: Sequence Diagram Activate Checkpoint

Survive Session

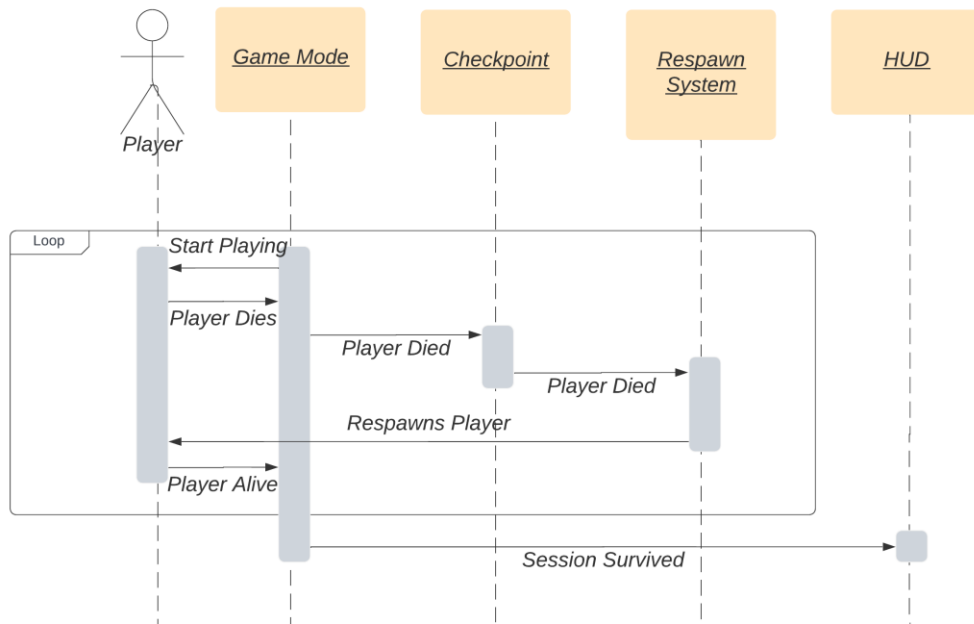


Figure 3.11: Sequence Diagram Survive Session

Complete Session

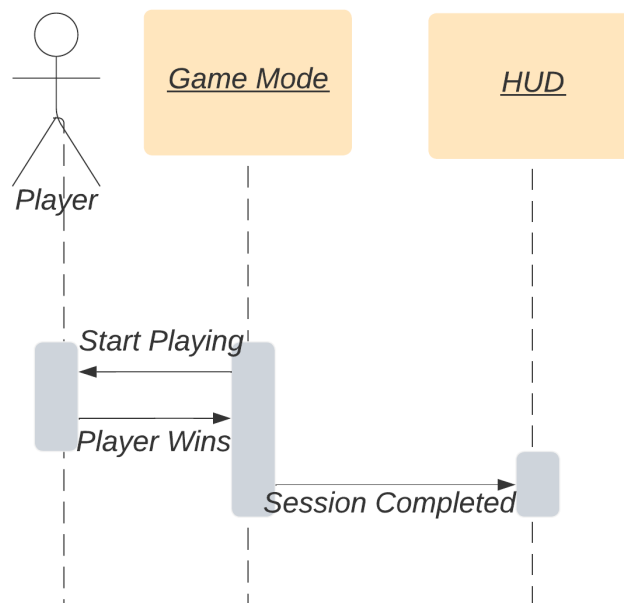


Figure 3.12: Sequence Diagram Complete Session

Reach Ending

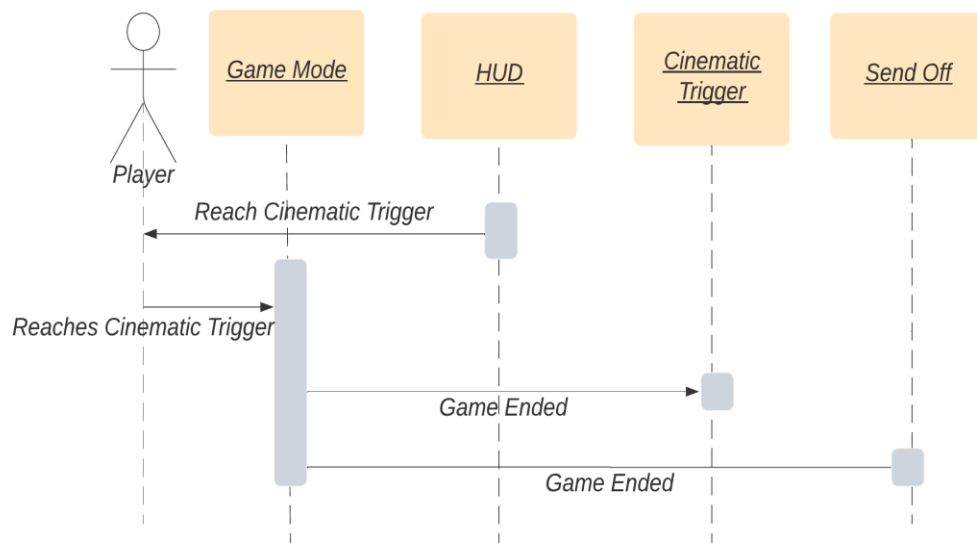


Figure 3.13: Sequence Diagram Reach Ending

3.5 Entity Relationship Diagram

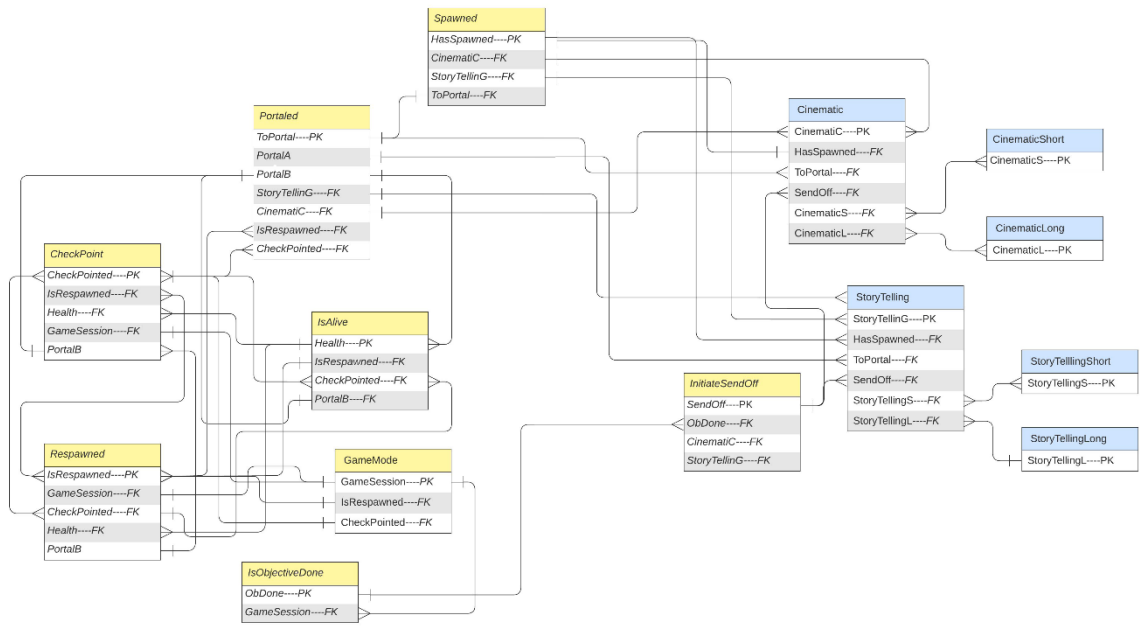


Figure 3.14: Entity Relationship Diagram

CHAPTER 4: WORKFLOW

4.1 Unreal Engine 4

We have used Unreal Engine 4.27.2 throughout the project. It is very advanced game engine specially used for game development, architectural and automotive visualization with a lot of real-time application. I have used this ultra-complex game engine with a lot of self-learning, exploring and with the help of Unreal Engine Communities. (Appendix A)

4.2 Blender

Crafting the environment to meet the realism I envisioned while self-providing all the resources I need, I had to go through a lot of 3D modeling, texturing and animating with the help of Blender 3.1.0

4.3 Adobe After Effect

Adobe After Effect being very accurate with few of their parameters, I had to go back to it a lot of times to perform which other software like Adobe Photoshop could not.

4.4 Adobe Photoshop

While designing the environment, Adobe Photoshop was my one of the most used software after Unreal Engine and Visual Studio. For any kind of texture mapping on Unreal Engine, I had to work with thousands of materials, cropping them, resizing them, blending them, making textures seamless and many more accessibilities were only possible because of Adobe Photoshop.

4.5 Adobe Substance 3D Painter

For high level details for a lot of 3D objects at the Unreal Engine Substance Painter helped me through a lot of impressing works of the project.

4.6 Audacity

While voice acting, audacity helped me through a lot of noise and editing and trimming with audio files.

4.7 Materialize

While Photoshop had my back for a long time, it was really faulty when I had to work on normal map(Appendix B) of the projects, Materialize ensure a lot of features on that topic while providing few other facilities.

4.8 NVIDIA Plug-ins for Adobe Photoshop:

While painting the skybox(Appendix C) for my map, I could not get them to the desired software as Photoshop does not provide any built in skybox extractor (.DDS format).

4.9 Speed Tree

Astral Ashes 2.0 being an open world FPS game, we had to do higher level of foliage painting and modeling, which by the help of SpeedTree it was possible.

4.10 Spacescape

Spacescape is a great software to contribute to the painting of skybox.

4.11 Visual Studio 2019

Working on the Unreal C++ for the longest time, it has been a great helping hand debugging, decoding, exploring, implementing crucial and critical algorithms with thousands of class dependency across the engine while changing parameters and code frequently every hours, it would have been proved very difficult if not for the accessibilities Visual Studio provides along with Unreal C++.

4.12 World Machine

I have used a 40km x 40 km landscape on my game, instead of forcing me to sculpt each meter, inch by inch world machine helped me to create the exact landscape I wanted my landscape to be like. Very useful software to consider all the layers of a landscape by every little and immense details.

CHAPTER 5: CONCLUSION

5.1 Project Summery

Astral Ashes 2.0 is a fictional storytelling action video game developed by Md Yahya as a final year project. The story of the game follows an intelligent pious character “Nooh”, who has started his journey to implement all the knowledge his father ensured he got before their awaited journey set for together when Nooh would turn 25. Unfortunately death of his father right before their adventure was very hard for him, but the teaching of his religion and the wisdom of his father got him up for the adventure Nooh has always been ready for.

5.2 Future Scope

The origin story and the environment has been set for more improvement and more extension of game modes and mechanics, definitely the first step is always the hardest and now which has been taken. We are ready for any further expansion of story and game.

CHAPTER 6: APPENDICES

Appendix: A

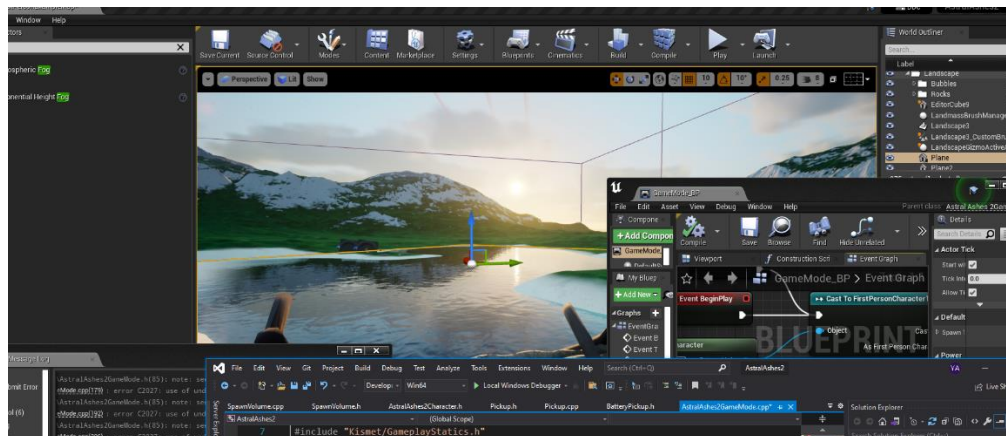


Figure 6.1: Unreal Engine Workstation

We are looking at Unreal engine 4 here, I am using it as a real-time game developing application.

Appendix: B

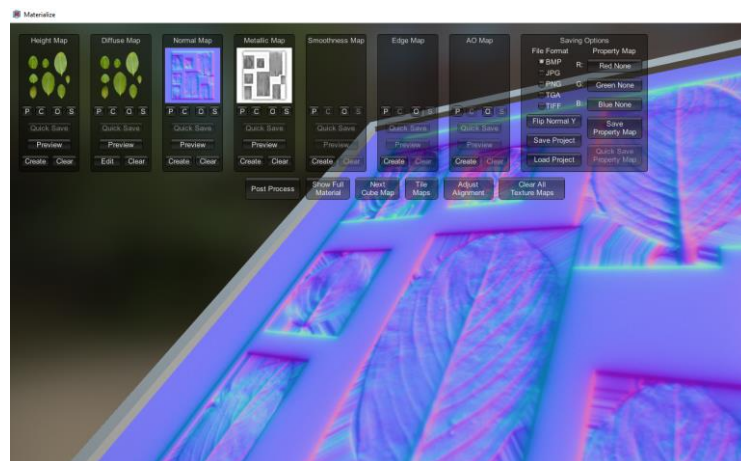


Figure 6.2: Materialize

We are looking at normal map here, this is how the normal map decides which part of the material will bounce off to which way, illustrating details of the physical texture of the object.

Appendix C:

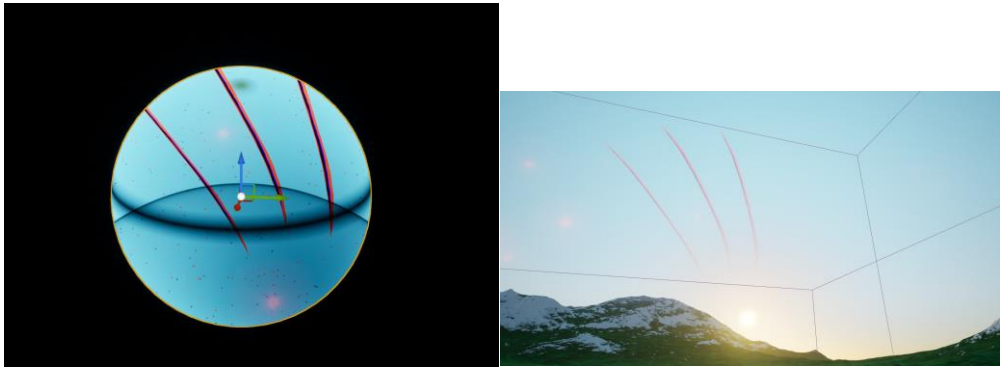


Figure 6.3: Skybox Reference

We are looking at this round structure (left) which represents the sky (right) in our game, it has been painted by using more than few software to get this visualization.

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