Zombie Rush

Final Year Project

Session 2018-2022

A project submitted in partial fulfillment of the degree of

BS in Computer Science

Department of Computer Science

Faculty of Computer Science & Information Technology

Superior University, Lahore

FALL 2021

Type (Nature of project)	[✓] **D**evelopment [ ] **R**esearch [ ] **R&D**
Area of specialization	Steam, Android
FYP ID	FYP-BCSM-F21-064

Project Group Members

Sr.#	Reg. #	Student Name	Email ID	*Signature
(i)	BCSM-F18-368	AbdulRehman	BCSM-F18-368@superior.edu.pk	
(ii)	BCSM-F18-360	Abdullah Javaid	BCSM-F18-360@superior.edu.pk	
(iii)	BCSM-F18-387	Muhammad Shahroz	BCSM-F18-387@superior.edu.pk	

*The candidates confirm that the work submitted is their own and appropriate credit has been given where reference has been made to work of others

Plagiarism Free Certificate

This is to certify that, I **AbdulRehman** son of Mateen Zia, group leader of FYP under registration no **BCSM-F18-368** at Computer Science Department, Superior University, Lahore. I declare that my FYP report is checked by my supervisor.

Date: Name of Group Leader: Abdul Rehman Signature: _____

Name of Supervisor: Ms. Faiqa Maqsood

Designation: Lecturer

Signature: _____

HOD: Dr. Irfan ud Din

Signature: _____

Project Report

Zombie Rush

Change Record

Author(s)	Version	Date	Notes	Supervisor's Signature
	1.0		<Original Draft>	
			<Changes Based on Feedback from Supervisor>	
			<Changes Based on Feedback From Faculty>	
			<Added Project Plan>	
			<Changes Based on Feedback from Supervisor>	

APPROVAL

PROJECT SUPERVISOR

Comments: _____

_____

Name:_____

Date:_____ Signature:_____

PROJECT MANAGER

Comments: _____

_____

Date:_____ Signature:_____

HEAD OF THE DEPARTMENT

Comments: _____

_____

Date:_____ Signature:_____

Dedication

This work is dedicated to my respected parents, family and teachers whose utmost love, care and struggle against all odds brought me to this height of knowledge and encouraged me to complete this degree and were major driving force behind my all efforts with the blessings of ALMIGHTY ALLAH.

Acknowledgements

I am thankful to ALLAH ALMIGHTY who gave me the courage and passion and prayers of my parents and teachers to achieve the goal that was necessary for the degree. Although it was not an easy task, with the useful direction, kind supervision, and co-operation of **Ms. Faiqa Maqsood**, it became easy for me to complete the research work. I am grateful to my Project Supervisor because of his profound interest and encouragement throughout the project work.

I would like to acknowledge **Mr. Jawad Ahmad**, for encouraging and providing me all the facilities throughout the project.

Last but not least, I extend my sincere appreciation and thankfulness to my Family for their incredible encouragement. Their love and support mean a lot to me.

Executive Summary

It is a third-person offline single-player shooter game. A story mode is introduced in the game. The story begins when a Meteor crashed on the surface of the earth and caused a virus which resulted in making humans do abnormal activities and in the end, it turned them into zombies. A character is a common man trying to survive the zombie apocalypse. The goal of our main character is to fight his way through waves of zombies to reach its destination which is the last of surviving human society. The game has excellent graphics and there are no glitches in the environment or character movements.

Table of Contents

Contents

Chapter 1

Introduction

Chapter 1: Introduction

It is a third-person offline single-player shooting game. In terms of gameplay, there will be one playable character, and resources, weapons, and shelter will be available in further gameplay.

A story mode is introduced in the game. A character is a common man trying to survive the zombie apocalypse. The goal of our main character is to fight his way through waves of zombies to reach its destination which is the last of surviving human society.

1.1. Problem Statement / Background

These days, there are not many games on zombies some depend on simply killing them and some depend on restoring; There is no addictive storyline to follow for the gamers. Some give a great realistic yet dull story and some furnish terrible designs with a great story.

We are making a game which will furnish great designs with inventive/secrets storyline, we will give an addictive storyline to the gamers so when they finish this part then they stand by frantically for the following one and when we will be finished with our game you will have a first-class game which will be adored by everybody.

1.2. Motivations and Challenges

Motivation for the game development for us is the fondness of the game. The way it is played, the way its components work, with flow. The number of gamers also increasing day by day. Challenges mostly for us is to Render Graphics, the use of WebGL build of Unity. Also, control on the performance optimization so that mostly players can play if they have low end devices.

1.3. Goals and Objectives

Zombie Rush is a third-person shooter disconnected single-player game planned for giving a fun and engaging player experience to gamers all around the globe. The game will at first delivered for Windows 64-piece on Steam.

The primary target of the game is to help individuals from all around the globe improve a portion of the aptitudes that will help them, in actuality, for example, endurance, better dynamic, improved perception, and quicker response time through our game. The game will likewise be the establishment of PC game advancement in Pakistan as most (if not the entirety) of the game improvement studios in the nation are restricted to portable game advancement as it were.

The game will comprise of

- third Person Perspective
- Guns and Ammunition
- Different Terrain and Location
- Aliens and as Enemies/Target
- Different Difficulty Levels
- Health Bar
- Character Animation
- Sound Effects

1.4. Literature Review/Existing Solutions

There are some games that are available now-a-days. They are basically offline so they can be our competitor. Some of these are as follows:

- N.O.V.A Legacy
- Cover Fire
- Lone Wolf
- Dead Effect 2
- Overkill 3
- Dead Trigger 2

1.5. Gap Analysis

As we are starting to make an offline game and there are many online games available as multiplayer and Battle Royale which are famous now-a-days but also many of the gamers and streamers plays offline game as they are more relaxing than online ones. So, we will also continue to move our game into Online and Multiplayer ones.

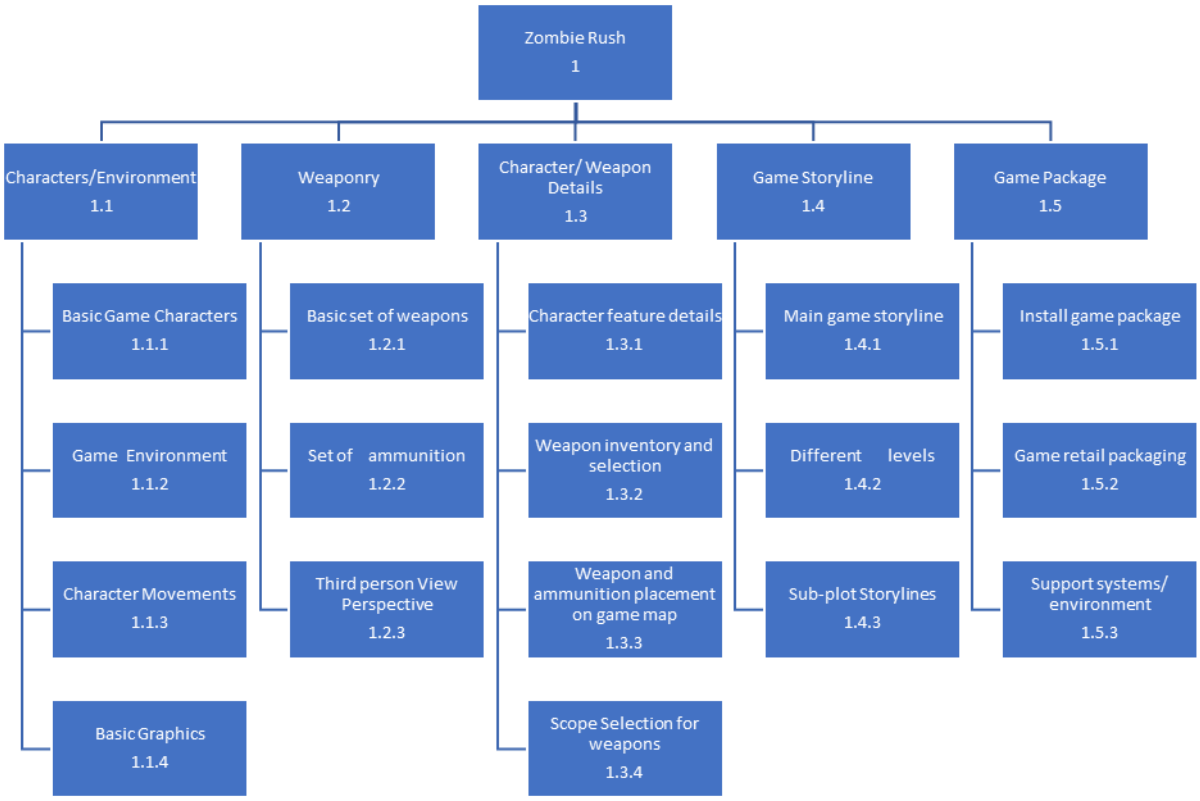
1.6. Proposed Solution

We are creating a game that will provide high-quality graphics with a creative/mysterious storyline, we will give an addictive storyline to the gamers so that when they finish this part then they wait desperately for the next one and when we will be done with our game you will have a top-notch game which will be loved by everyone.

1.7. Project Plan

The Story is based on a human who is trying to survive in the zombie apocalypse. The story begins when a Meteor crashed on the surface of the earth and caused a virus which resulted in making humans do abnormal activities and in the end, it turned them into zombies. Now after decade zombies have increased drastically and now there is a very small portion of human society that are unaffected by the virus, they have made their safe base to protect them from the zombies. The goal of our main character is to fight his way through waves of zombies to reach its destination which is human society.

1.7.1. Work Breakdown Structure



1.7.2. Roles & Responsibility Matrix

Responsibility Chart	Member1 AbdulRehman	Member 2 Abdullah	Member 3 Shahroz	Director of design	Outside Consultant
Game Design	1	1	1		3
Final Report	1	2	2		
Weekly Meetings	1	2	2		3
Develop Project Plans	1	2	2		
Track Progress	1	1	1		
Progress Reports	4	2	2		

Key:

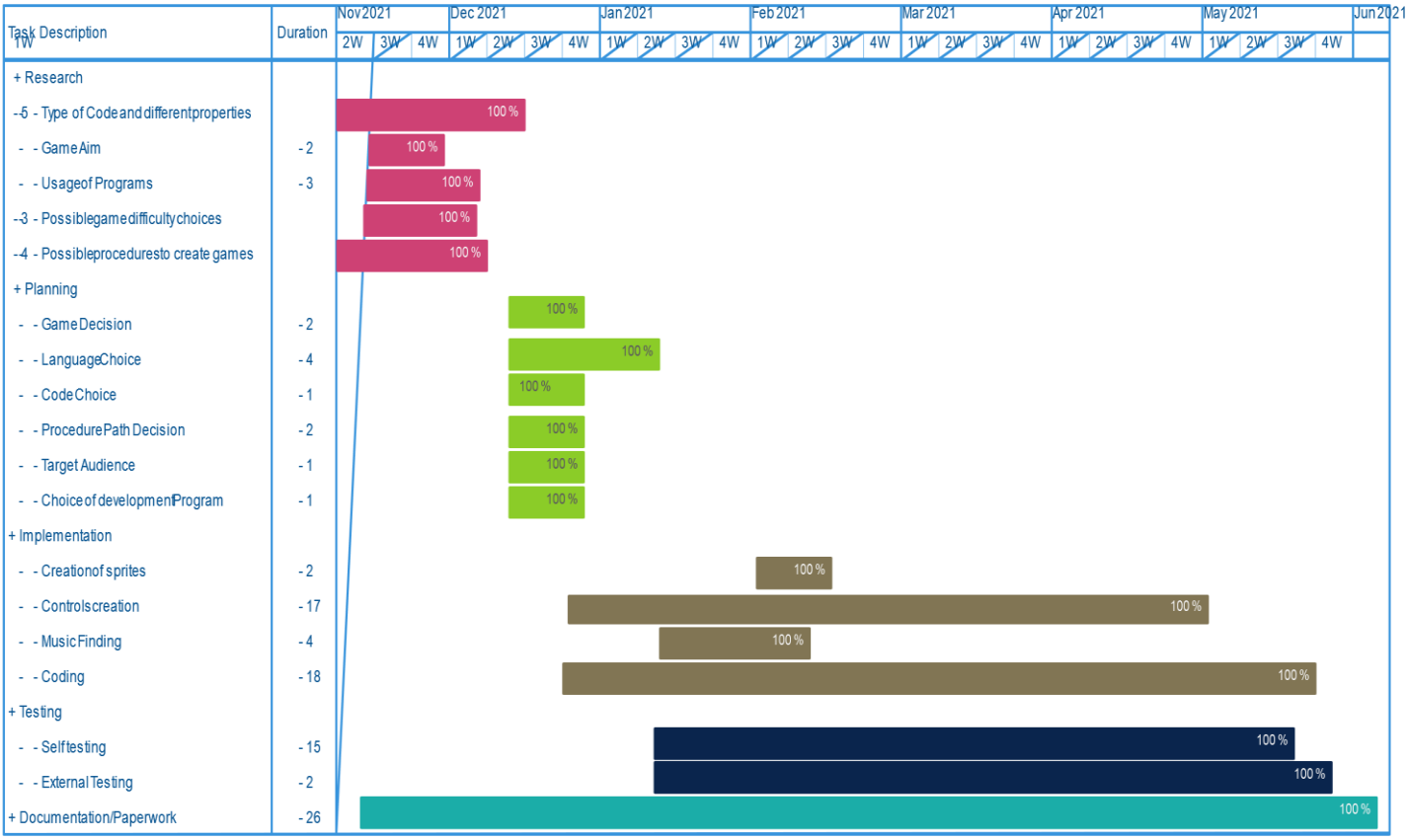
1 = Primary Responsible

2 = Supporter

3 = Must be Consulted

4 = Review

1.7.3. Gantt Chart



1.8. Report Outline

Zombie Rush is a third-person shooter detached single-player game made arrangements for giving a fun and connecting with player experience to gamers all around the world. The game will from the outset release for Windows 64-piece on Steam, yet reduced to Android, IOS, Macintosh working framework, PlayStation 4, Xbox One, and Nintendo Switch.

The standard objective of the game is to help people from all around the world improve a part of their aptitudes that will support them, taking everything into account, for instance, perseverance, better power, improved discernment, and snappier reaction time through our game. The game will moreover be the foundation of PC game improvement in Pakistan as most (if not the sum) of the game progression studios in the country are compelled to flexible game headway.

Chapter 2

Software Requirement Specifications

Chapter 2: Software Requirement Specifications

2.1. System Features

- Title Screen
- Main Menu
- Start Game
- Settings
- About
- Exit
- Pause Menu
- Help
- Player
- NPC(Zombie)
- HUD(Heads Up Show)

2.1.1. System Feature 1

2.1.1.1. Title Screen

Description:

The title screen is the screen the player will see each time after running the game. It will consolidate the sprinkle screen of the improvement gadgets used in making the game. After that, it will join the guideline logo of the game with an established as shown by the game point.

A message will be appeared on the screen mentioning that the customer press Enter key to start and it will go to the essential menu screen.

2.1.1.2. Reaction:

- The player dispatches the game on the framework.
- The title screen stacks up and shows on the screen provoking the player to press "Enter"

Response:

- The player presses the "Enter" key which triggers its capacity taking the player to the principal menu

Description and Priority

The essential menu will appear before the customer after the title screen in the wake of completing its significant necessities to complete that are pressing the Enter key in the title screen. It will show the choices of Start Game, Proceed Game, Settings, and Exit.

Stimulus/Response Sequences

- The player presses Enter key from the title screen.
- The principal menu comes up showing the necessary alternatives

2.1.1.3. Functional Requirements

REQ-SF1-1: The title screen must load up and show each time after propelling the game

REQ-SF1-2: If the player presses the "Enter" key it ought to play out its capacity and burden the primary menu

REQ-SF1-3: If the player finishes the game, the game will end restoring the player to the title screen

2.1.2. System Feature 2

2.1.2.1. Description and Priority

The first choice accessible on the fundamental menu after squeezing it the game will begin.

2.1.2.2. Stimulus/Response Sequences

- The player presses the beginning game choice by choosing it
- The game will load and start

2.1.2.3. Functional Requirements

REQ-SF2-1: The principal menu should consistently come up after the title screen upon eachtime propelling the game.

REQ-SF2-2: The alternatives in the principal menu must show on the screen for the client to collaborate.

REQ-SF2-3: If the player begins any of the alternatives accessible on the fundamental menu their capacity must be performed.

2.1.3. System Feature 3

Settings:

2.1.3.1. Description and Priority

Settings give various choices to clients to change the illustrations, sound, and ongoing interaction settings to guarantee a better player experience just as smooth running of the game on various kinds of equipment.

Settings can be gotten to be heading off to the fundamental menu and tapping on the "Settings" button. Settings further partition the accessible settings into four classifications:Designs, Sound, and Ongoing interaction.

2.1.3.2. Stimulus/Response Sequences

- The player presses the Settings alternative by choosing it from the fundamental menu.
- The framework will open the settings menu that is accessible.

2.1.3.3. Functional Requirements

REQ-SF2-1: The framework should consistently open the settings menu after squeezing the Settings alternative.

REQ-SF2-2: All the settings that are accessible must work and apply in the game.

2.1.4. System Feature 4

Player:

2.1.4.1. Description and Priority

The player is the key character of the game which the customer will control during continuous communication. As this is an FPS game so customers will consider them to beof the player as in detail the customer will see the arms of the player. All the turns of eventsand exercises of the player will be obliged by the customer depending upon their data key.

The player's looks will be controlled by the Mouse and he will attack/shoot through crushing the left snap of the mouse.

Every other turn of events and exercises will be controlled from the Console with a coupleof information keys for every limit.

2.1.4.2. Reaction

- The player is available in the game after beginning it
- The control inputs communicate with the player and play out the function (movingforward)

2.1.4.3. Functional Requirements

REQ-SF2-1: The framework should consistently play out the procedure on the player when the client squeezes its key (after squeezing the left snap of the mouse the player must assault or shoot).

2.2. Other Nonfunctional Requirements

2.2.1. Performance Requirements

To guarantee best player involvement in smooth interactivity and elite, after are the prescribed prerequisites to run the game at most extreme realistic settings with stable 60 casings for every second:

- OS.: Windows.7.64-Bit./. Windows.8.64-Bit./. Windows.8.1.64-Bit./. Windows.10.64-Bit
- Processor: Intel(R). Core (TM). i5-3570.at.3.40. GHz. or equivalent
- Memory.:.8.0 GB of RAM
- Graphics.: NVIDIA.GeForce.GTX.750.Ti.at.2GB./.ATI.Radeon.HD.7870.at.2GB
- DirectX.: Version.11.0
- Hard Drive.:.12.0 GB of free space
- Sound Card: DirectX Compatible

Chapter 3

Use Case Analysis

Chapter 3: Use Case Analysis

Use case analysis is a technique used to identify the requirements of a system and the information used to both define processes used and classes which will be used both in the use case diagram and the overall use case in the development or redesign of a software system or program.

A use case analysis is the primary form for gathering usage requirements for a new software program or task to be completed. The primary goals of a use case analysis are: designing a system from the user's perspective, communicating system behavior in the user's terms, and specifying all externally visible behaviors.

3.1. USE Case

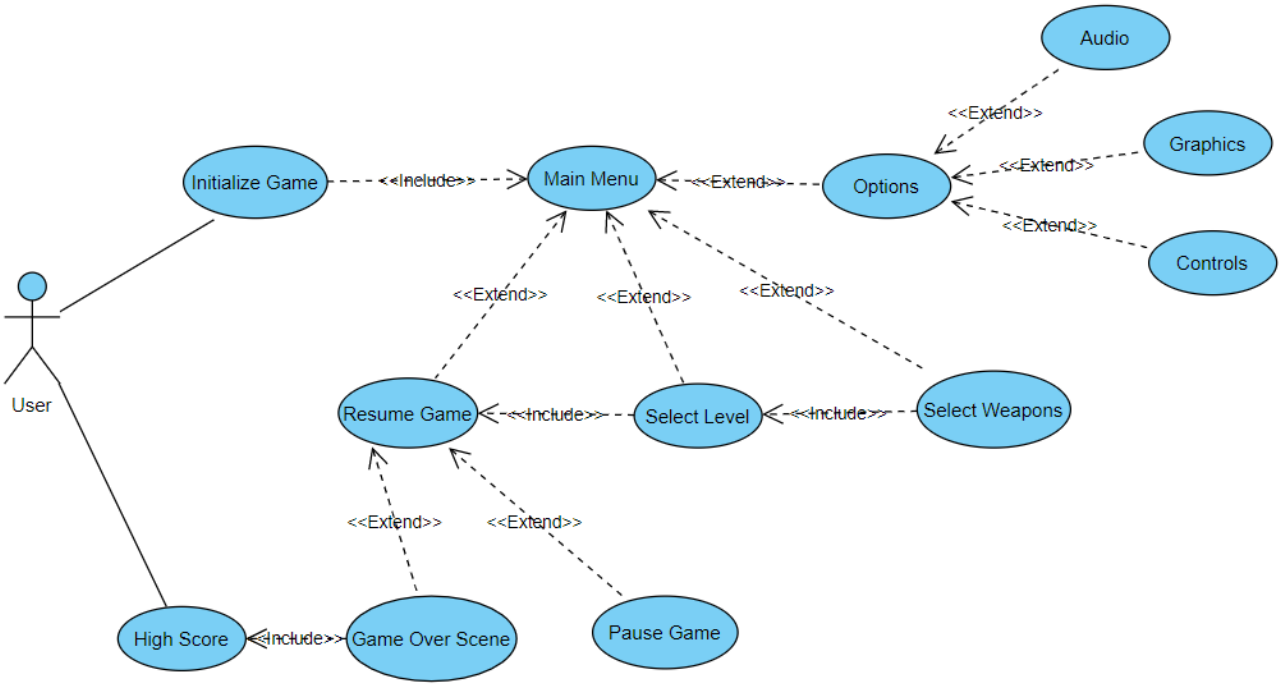


Figure 1 Use Case Diagram

3.2. Use Case Models

Run Application:

The user will run the Application by opening the executable file of the game and the game will run.

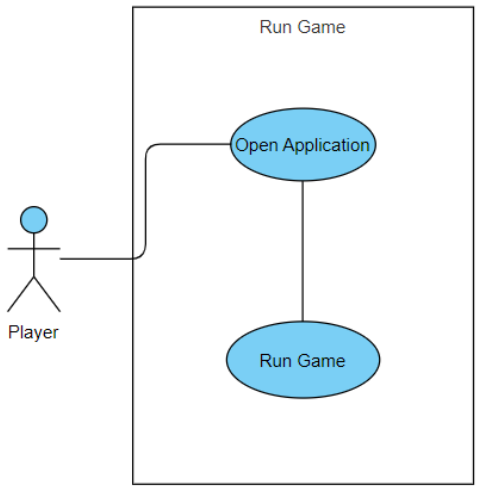


Figure 2. Run Game

Main Menu:

This is the main screen that client sees when the game loads up. It gives admittance to PlayGame, Options, and Exit.

To play the game just snap on the Play catch and it will stack the following scene. For Mode essentially click on the button and the game will stack the scene. To change settings go to the Options button. To Exit the game snap on the Exit button.

Player:

The in-game player can play out all the capacities accessible in the outline.

This outline portrays all the developments and activities the player can perform. The look is constrained by the mouse which glances around in the game. The player can push ahead, in reverse, both ways. The player can Aim and Shoot or essentially shoot. The player can hop, hunker and run

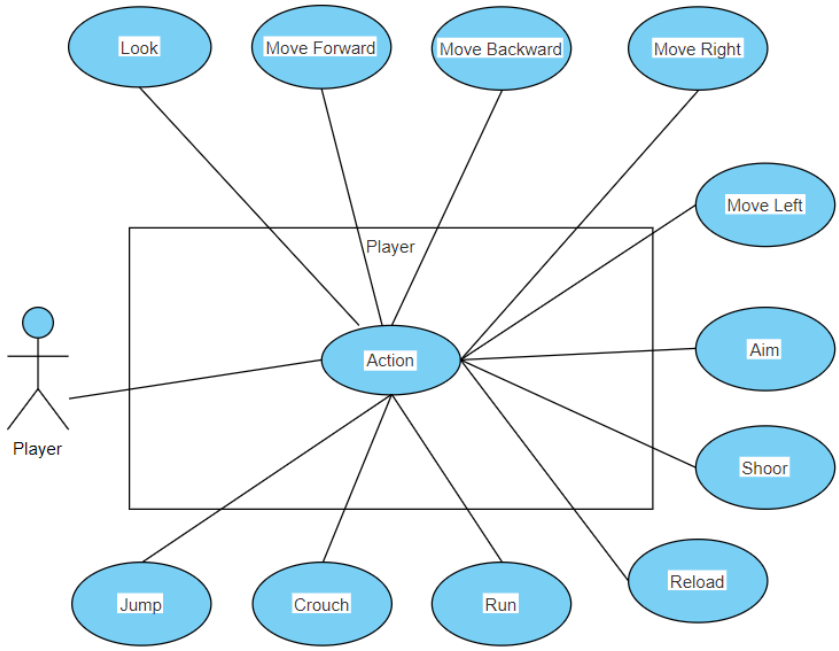


Figure 3. Player

Inventory:

Any item which is an inventory item can be picked up by the player which will be added to the inventory. The player can use it, drop it, or bind a shortcut key to it. Any inventory that the player picks up adds up in the inventory tab where he can view the item. When anitem is added to the inventory the player can either use the item, drop the item, and if it is a weapon a shortcut key can be bind to it.

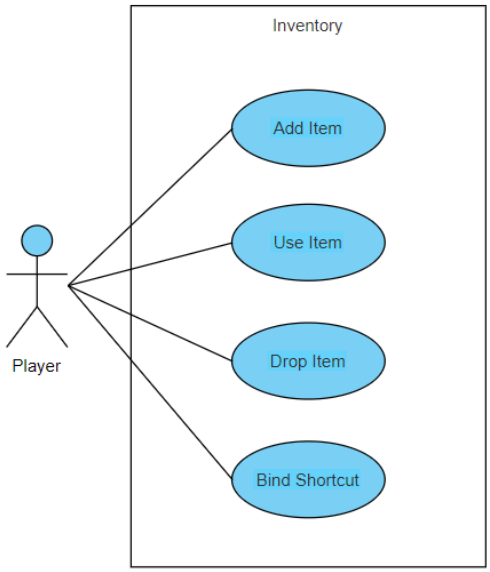


Figure 4. Inventory

Weapon System:

The player will find weapons in the game he can pick them up which will add up to the inventory or drop a weapon.

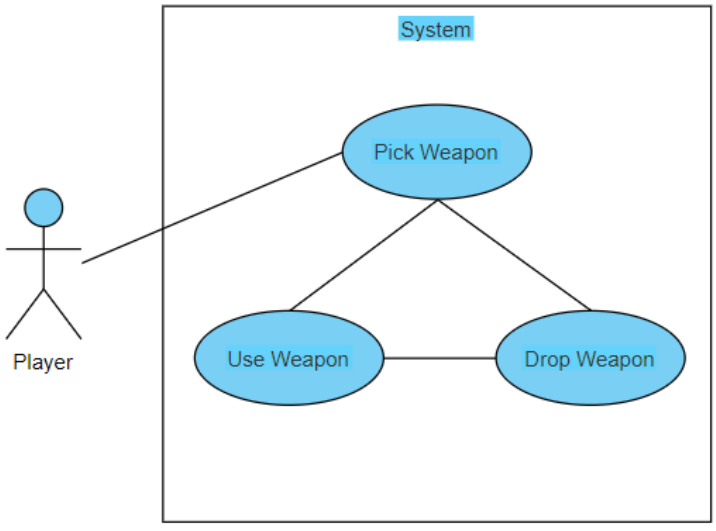


Figure 5. Weapon System

Options:

Settings give numerous choices to clients to modify the designs, sound, and interactivity settings to guarantee better player experience just as smooth running of the game on various kinds of equipment settings can be gotten to by heading off to the fundamental menu and tapping on the "Choices" button. Settings further partitions the accessible settings into three classifications: General, Graphics, and Controls.

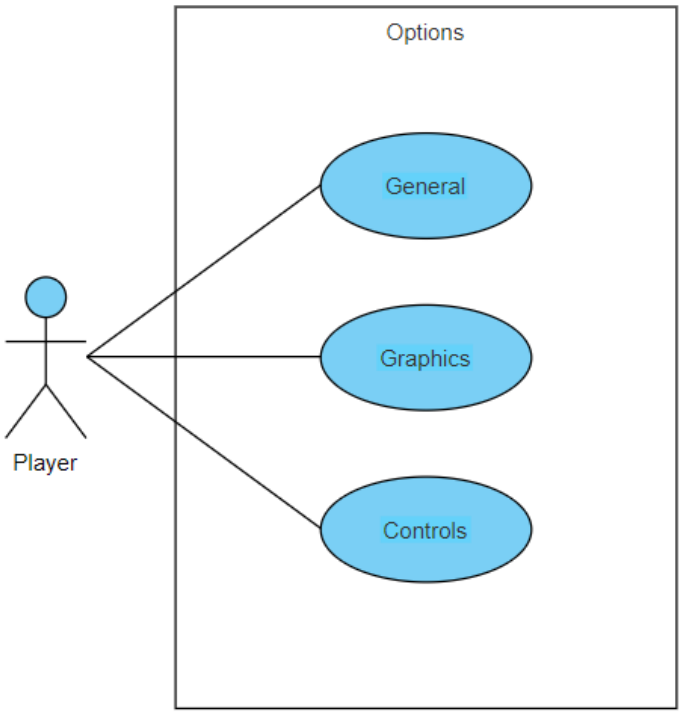


Figure 6. Options

Exit:

The Exit button will be used to exit the game from the Main Menu. To exit simply click on the exit button The user clicks on the Exit button from the Main Menu and the application exits

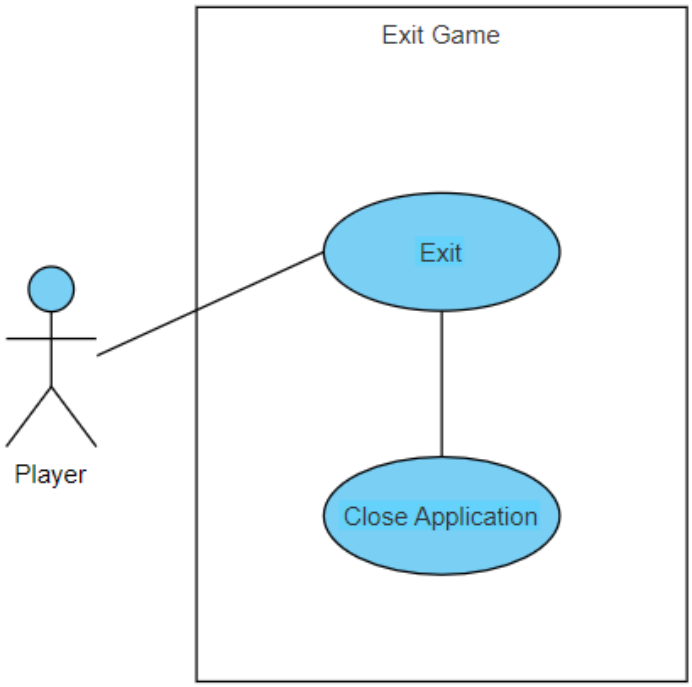


Figure 7. Exit

Chapter 4

System Design

Chapter 4: System Design

System Design is the process of designing the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through the system.

4.1. Architecture Diagram

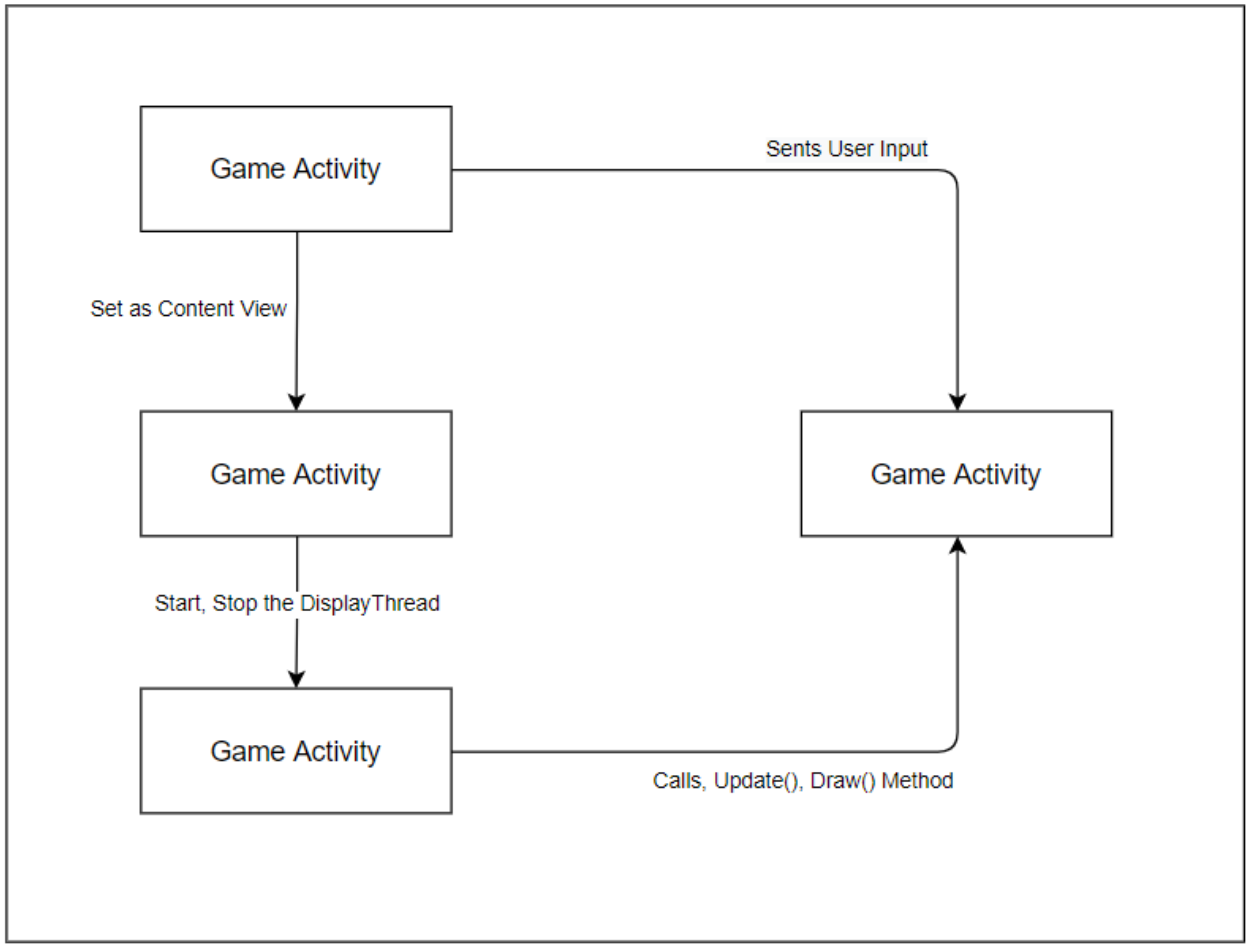


Figure 8 System Architecture

4.2. Entity Relationship Diagram with data dictionary

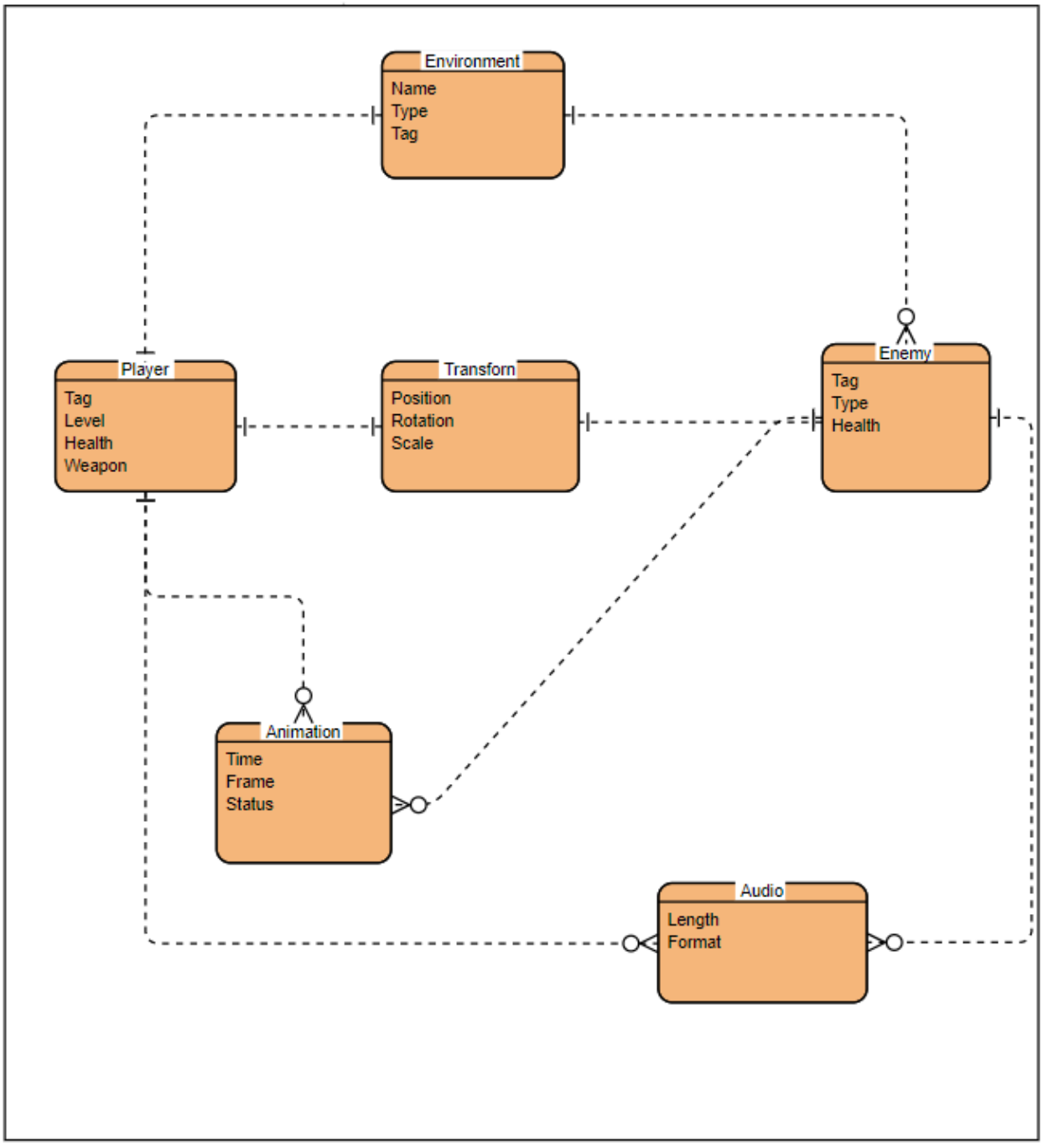


Figure 9 Entity Relationship Diagram

4.3. Class Diagram

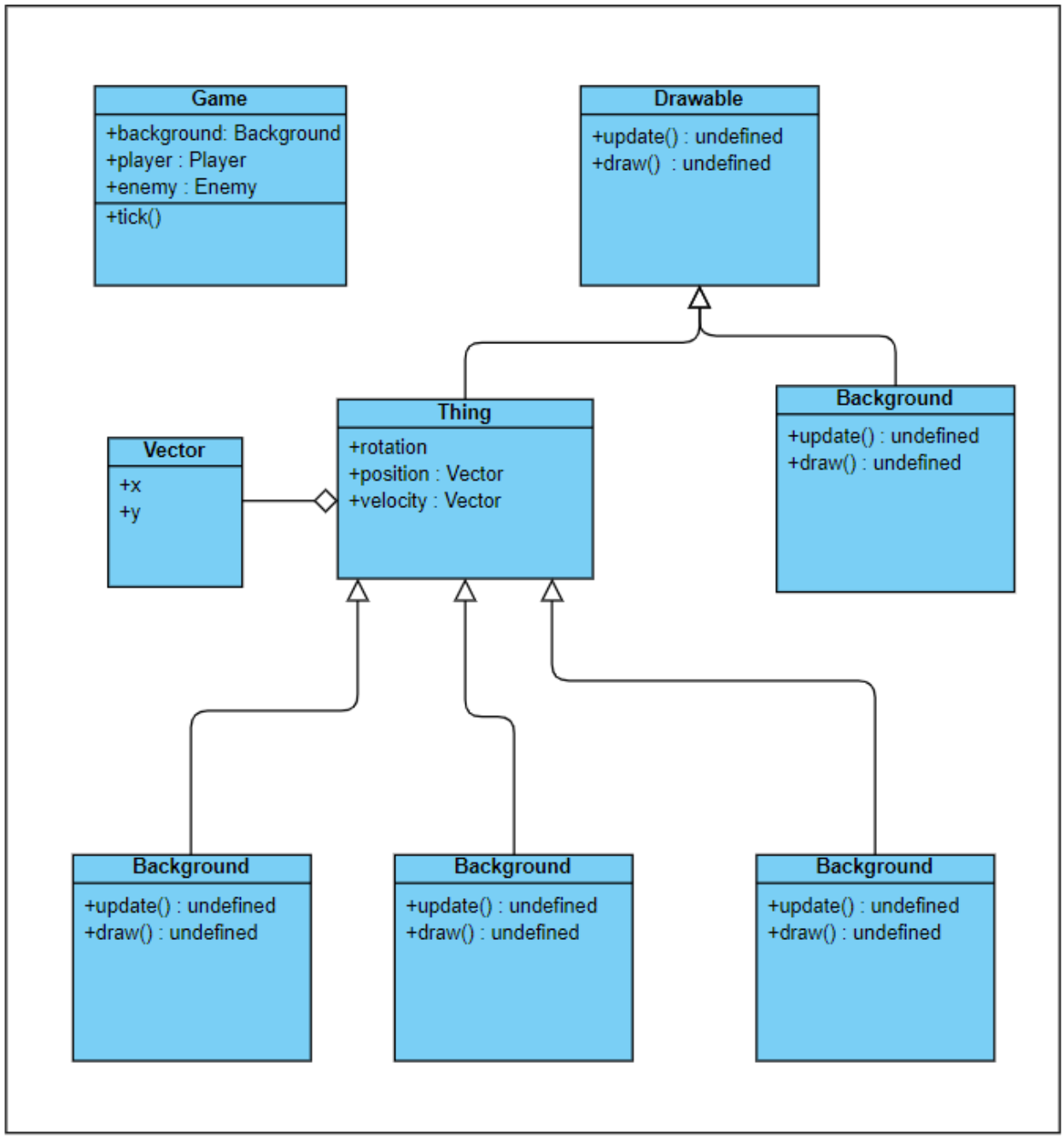
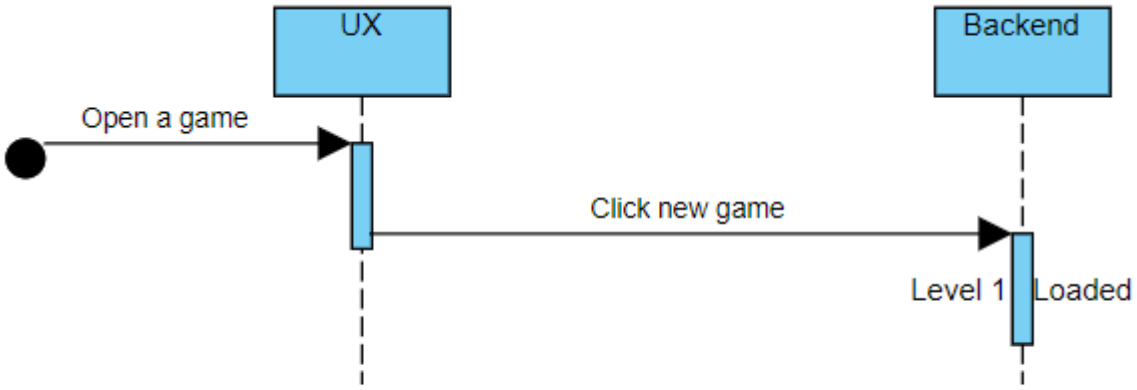


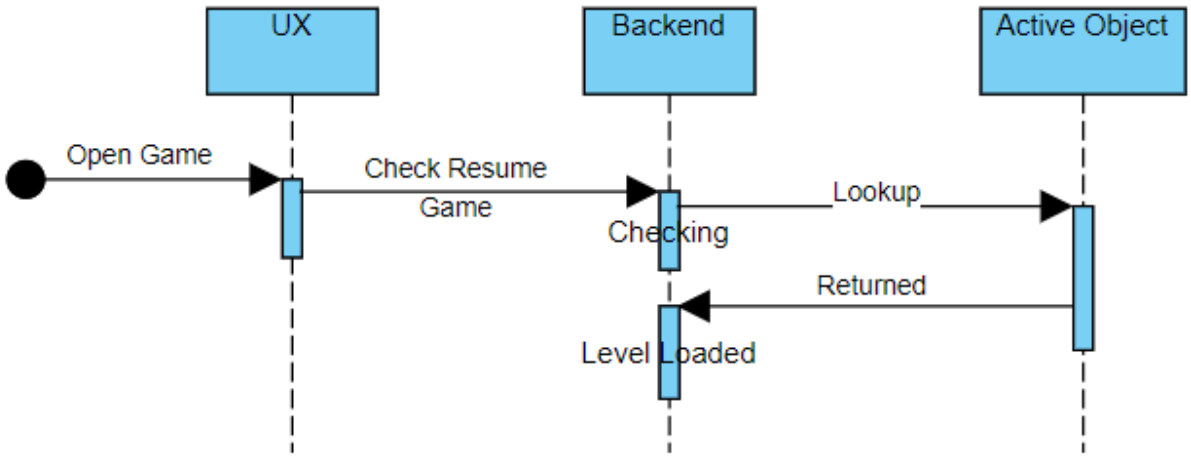
Figure 10 Class Diagram

4.4. Sequence / Collaboration Diagram

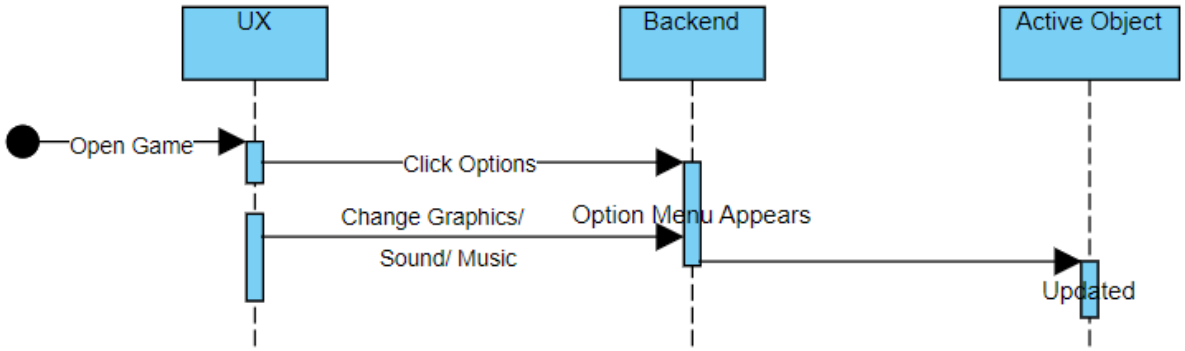
4.4.1 Start Game:



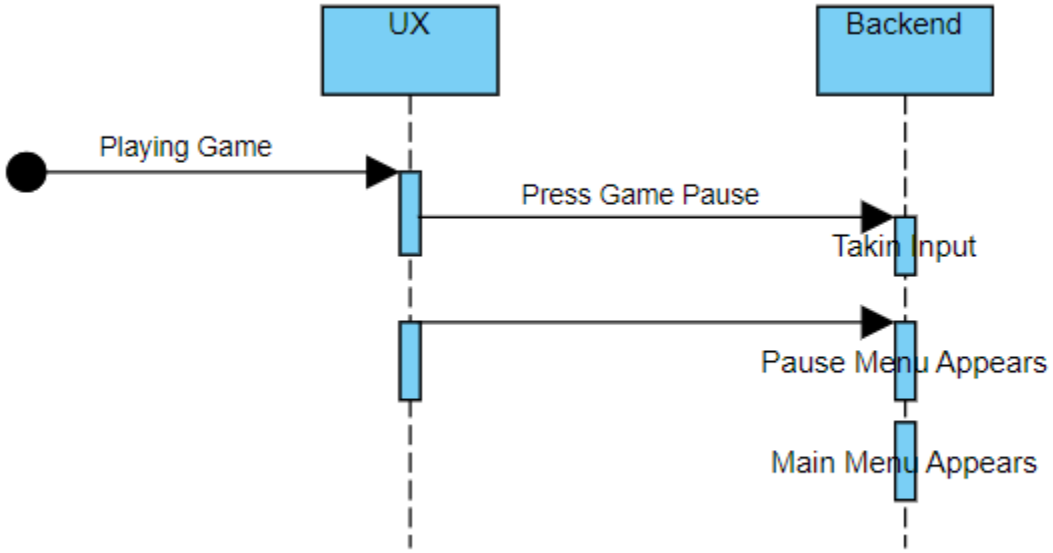
4.4.2 Resume Mode:



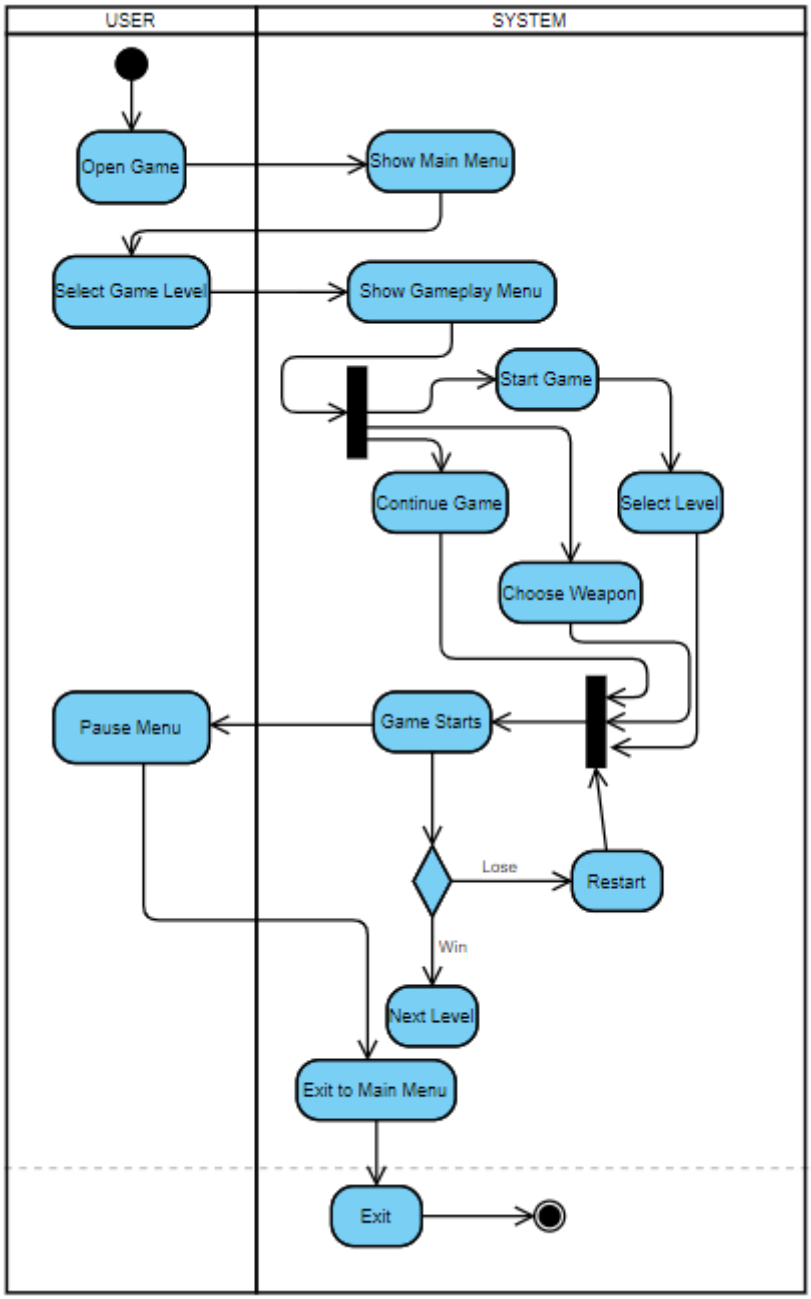
4.4.3 Change Display/Reset:



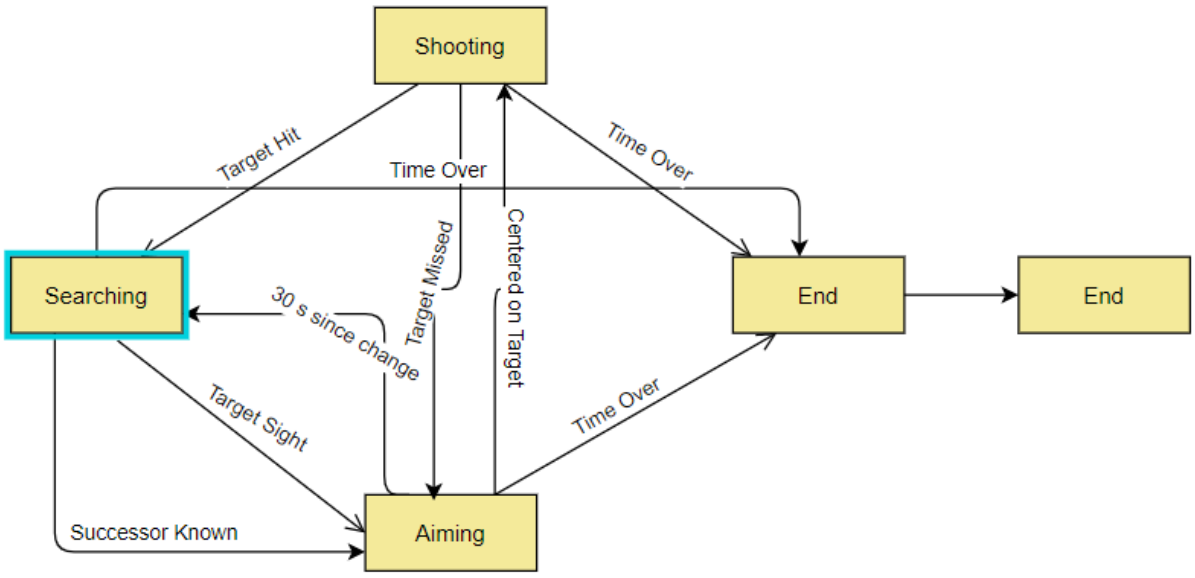
4.4.4 Exit Game:



4.5. Activity Diagram



4.6. Data Flow diagram



Chapter 5

Implementation

Chapter 5: Implementation

This chapter includes the important flow control, Components, Tools and Techniques, andbest practices used in the development of the game.

5.1. Deployment Environment / Languages

- **Android:**

Android software development is the process by which new applications are created for the Android operating system. Applications are usually developed in Java programming language using the Android software development kit (SDK), but other development environments are also available. We have used the android programming language in our mobile application.

- **C#:**

C# (pronounced "C-sharp") is an object-oriented programming language from Microsoft that aims to combine the computing power of C++ with the programming ease of Visual Basic. C# is based on C++ and contains features similar to those of Java. We have used C# in our web application.

5.2. Tools and Techniques

5.2.1 Unity:

We have used unity for the creation of our game because it allows a primary scripting APIin C#, for both the Unity editor in the form of plugins and games themselves, as well as drag and drops functionality.

5.2.2 Android Application:

- **Android Studio:**

We have used the android studio for the implementation of our android application. wehave selected it because we have experience with it. Another reason for choosing it is Android Studio makes code writing and analysis faster, easier, and more accurate.

5.2.3 Documentation:

- **Microsoft Word:**

To write the documentation for our project, we chose Microsoft word, because just like more than 3 quarters of the world we have experience with it. Also, not only is Word relatively easy for basic users to work with; it is also a standard product and so heavily in use across almost everywhere in the world, a documentwritten with Word can easily be sent to other team members for review and editing, without worrying about whether they can open it.

- **Snipping Tool:**

We have used Snipping tool in our project documentation mainly to take screenshots. This document contains many diagrams and tables which were built on some other softwareor applications and would have been impossible to attach with the documentation if it was not for the screenshot feature of paint.

- **Visual Paradigm:**

We have used Visual Paradigm to make use cases or any other diagrams that are required for this documentation. Mostly used Online feature of visual paradigm and then screenshot it using snipping tool.

5.2.4 Blender 3D:

We have used blender 3D for the modeling of the player and some of the scenes animation.

5.3. Best Practices / Coding Standards

Interface Id:	**UI – 01**
Description:	Gameplay view
Snapshot:	

Table 1: Gameplay View

Interface Id:	**UI – 02**
Description:	Zombie view
Snapshot:	

Table 2:Zombie View

5.4. Version Control

v1.0 is our initial release of game version

Chapter 6

Testing and Evaluation

Chapter 6: Testing and Evaluation

It is the process by which a system or components are compared against requirements and specifications through testing. The results are evaluated to assess progress of design, performance, supportability, etc.

Test Cases

6.1. Run Game

Use Case Number:	UC-1		
Title:	Run Game		
Created By:	AbdulRehman	**Edited By:**	
Date Created:	12/04/2022	**Date Edited:**	12/04/2022
Actors:	Player(Character)		
Summary:	The user will run the Application by opening the executable file of the game and the game will run.		
Trigger:	The player needs to start a new game		
Preconditions:	The game is installed on the computer or mobile The game is working.		
Normal Flow:	1. Go to the Main Menu of the game; 2. Click the play game button. 3. The new game is loaded on the system.		
Alternative Flows:	None		
Exceptions:	Game Crashed		

6.2 Main Menu:

Use Case Number:	UC-2		
Title:	Main Menu		
Created By:	Abdullah	**Edited By:**	

Date Created:	12/04/2022	**Date Edited:**	12/04/2022
Actors:	Player(Character)		
Summary:	To go to the Main Menu		
Trigger:	The player needs to start a new game		
Preconditions:	The game is installed on the computer The game is working.		
Normal Flow:	1. Go to the Main Menu of the game; 2. Click the play game button. 3. The new game is loaded on the system.		
Alternative Flows:	None		
Exceptions:	Game Crashed		

6.3Player:

Use Case Number:	UC-3		
Title:	Player		
Created By:	Shahroz	**Edited By:**	
Date Created:	12/04/2022	**Date Edited:**	12/04/2022
Actors:	Player(Character)		
Summary:	The player can move forward, backward, right, and left. The player can Aim and Shoot or simply shoot. The player can jump, crouch and run.		
Trigger:	Pressing buttons and giving commands from the keyboard.		

Preconditions:	The game is installed on the computer The game is working.
Normal Flow:	While playing the game, the character performs the actions when the respected buttons for those actions are pressed e.g Jump, crouch, run, aim and shoot.
Alternative Flows:	None
Exceptions:	The player is not responding to the commands Game Crashed

6.4 Options:

Use Case Number:	UC-4		
Title:	Options		
Created By:	AbdulRehman	**Edited By:**	
Date Created:	15/04/2022	**Date Edited:**	15/04/2022
Actors:	Player(Character)		
Summary:	To load options in the setting module.		
Trigger:	The player needs to tap the options button in the menu.		
Preconditions:	The game is installed on the computer The game is working.		
Normal Flow:	1. Press the options button in the menu 2. Options for setting menu opens up.		
Alternative Flows:	None		
Exceptions:	Game Crashed		

6.5Exit:

Use Case Number:	UC-5		
Title:	Exit Game		
Created By:	Team	**Edited By:**	
Date Created:	22/04/2022	**Date Edited:**	22/04/2022
Actors:	Player(Character)		
Summary:	To exit game		
Trigger:	Need to tap the exit button		
Preconditions:	The game is installed on the computer The game is working.		
Normal Flow:	1. Go to the Main Menu of the game. 2. Click the exit button. 3. The game shut down.		
Alternative Flows:	None		
Exceptions:	The player couldn't Exit. Game Crashed		

Chapter 7

Summary, Conclusion and Future Enhancements

Chapter 7: Summary, Conclusion & Future Enhancements

7.1. Project Summary

It is a third-person offline single-player shooter game. A story mode is introduced in the game. The story begins when a Meteor crashed on the surface of the earth and caused a virus which resulted in making humans do abnormal activities and in the end, it turned them into zombies. A character is a common man trying to survive the zombie apocalypse. The goal of our main character is to fight his way through waves of zombies to reach its destination which is the last of surviving human society. The game has excellent graphics and there are no glitches in the environment or character movements.

7.2. Achievements and Improvements

Zombie Rush will be from the outset pushed for Windows 64-piece working system available on Steam (automated game flow stage). In any case, Solidarity will be all responsible for both the progression of the game and its integration within the Windows structure. The headway of the game consolidates numerous verifiable parts (assets) and modules which will quicken the strategy of the improvement overall.

We will improve the game with respect to time. Its new versions will be release while it gets reputation. We can improve its Graphics and also can add new characters. One or two events will be launch in a month.

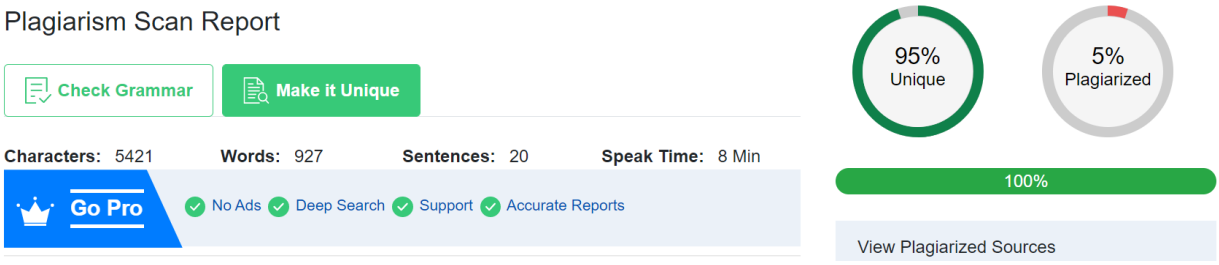
7.3. Lessons Learnt

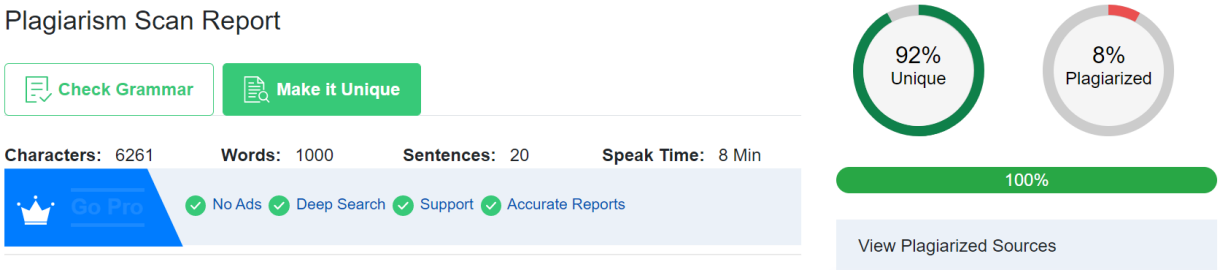
The lesson that I have learned is that hard work always pays off. By working on this project I have improved my skills. I have learned to work on C-sharp. I Developed 3d designs using blender 3D.

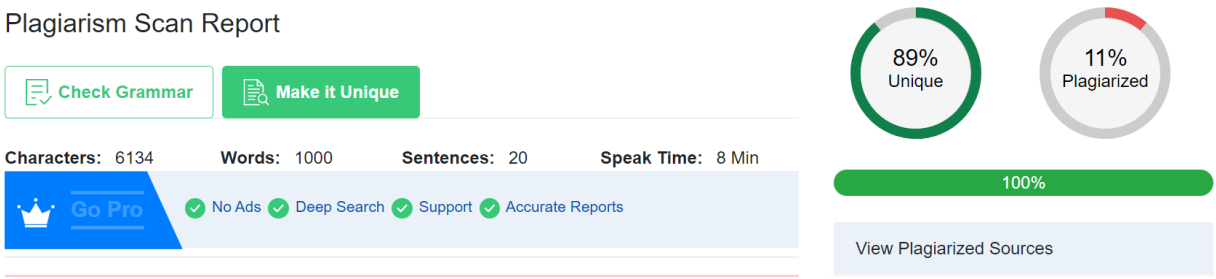
7.4. Future Enhancements/Recommendations

We will improve the game controls, add some new features like prawn. We will add more guns and will increase game levels up to 30. We will increase the number of zombies; with every new level there would be a different zombie character and at the last stages of the game the zombies will have guns. We will create an account and upload this on the play store.

Plagiarism Report:







Reference and Bibliography

Reference and Bibliography

Develop, R. T. (2021, February 8). *Critical Strike Commando Secret Mission Game*. Retrieved from https://play.google.com/store/apps/details?id=com.rtd.criticalstrike.newcommandogame.secretmissiongames2021

Develop, R. T. (2021, March 11). *Special Military Commando Battlefield Shooter Game*. Retrieved from https://play.google.com/store/apps/details?id=com.rtd.assassingame.specialops2021.miltarybattlefieldgame.newcommandogame

Develop, R. T. (2021, April 23). *Westland Cowboy Sword Fighting Game 2021*. Retrieved from https://play.google.com/store/apps/details?id=com.rtd.cowboy.westswordfighter.horserider.wildwest.actiongame2021.swordfightinggame.horseridinggame

games, F. (2019, August 10). *US Army Special Forces*. Retrieved from https://play.google.com/store/apps/details?id=com.fighting_games.us_army.Special.Forces.Missions.WW2

Games, N. (2020, October 13). *Modern Delta Force*. Retrieved from https://play.google.com/store/apps/details?id=com.ng.arenafreefire.codshooter.modernarenastrike.newtpsshootinggames