

Project Report

On

“Game Development”



As partial fulfilment for the degree of

Bachelor of Computer

Application At

**K.S.K.V. Kachchh University,
Bhuj.**

(April- 2022)

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SANSKAR INSTITUTE OF MANAGEMENT & INFORMATION TECHNOLOGY



CERTIFICATE

This is to certify that the project entitled “GAME DEVELOPEMENT” is a bonafide work carried out by **Dev Mehta (19BCA029)**, **Rahulpuri Gossai (19BCA013)**, **Vivek Malam (19BCA056)** for the degree of Bachelor of Computer Application at **Sanskars Institute of Management & Information Technology, Bhuj, Gujarat.**

To the best of our knowledge and belief, this work embodies the work of candidates themselves, has duly been completed, fulfills the requirement of the ordinance relating to the Bachelor degree of the university and is up to the standard in respect to content, presentation and language for being referred to the examiner.

Mr. Dhiraj Solanki
Project Guide

Mr. Chintan Raval
HOD-BCA



Thunder Game Development Studio

(AR/VR/2D/3D Production Company Since 2016)

Date: April 18, 2022

Place: Bhuj, Gujarat

Internship Experience Letter

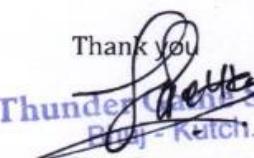
Whom It May Concern

This is to certify that Mr. Dev Mehta, Mr. Rahulpuri Gosai and Mr. Vivek Malam have successfully completed the project at Thunder Game Studio, Bhuj as part of fulfilment of BCA (Bachelor of Computer Application) at Sanskar Institute of Management & Information Technology, Bhuj affiliated with Krantiguru Shyamji Krishna Verma Kachchh University, Bhuj(Kachchh-Gujrat). The duration of project was about 3 months.

They have undertaken the project titled "Game Development". The project was developed using Unity, C#, Photon, Adobe XD, Blender, Mongodb, NodeJs. We are satisfied with the work they have done and the effort they have put in it.

During their training period they have been found to be diligent, focused and sincere toward their work schedule. Their progress during the project work has been appreciable.

They have successfully completed the project work assigned to them. We wish them success in their future endeavours.

Thank you

Thunder Game Studio
Bhuj - Kutch.
Jigar Pattani

(Co-Founder | TGS)

No. 15, 2nd Floor, Kshetrapal Square, Opp. Commerce College, Bhuj-Kutch. Gujarat +91-7990289257 info@thundergamestudio.com www.thundergamestudio.com

Candidate Declaration

We hereby declare that the work presented in this GAME DEVELOPMENT PROJECT name “Dimension Random Void-Verse” is submitted towards completion of semester 6 project development in the partial fulfilment of the degree of Bachelor in Computer Application, is our own work conducted under the supervision of the guide **Mr. Dhiraj Solanki** at ‘**Sanskars Institute of Management & Information Technology**’. Generally, **Massively Multiplayer Online Role-Playing Game (MMORPG)** takes more time to develop fully but we somehow manage to complete in the time given to us.

Dev Mehta (19BCA026)

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Mr. Dhiraj Solanki

I/C Principal & Lecturer, BCA Department

Project Guid

ACKNOWLEDGEMENTS

We would like to express our deep sense of gratitude and very thankful to everyone who helped and supported us during the completion of this project. Firstly, we would like to thank **Mr. Chintan P. Morabia, Director, SMIT** for providing us with the opportunity of developing the Game. We would also like to express our gratitude towards **Mr. Chintan Raval, HOD, BCA Department, SMIT** whose interest in the project was very beneficial.

Special acknowledgements to project guide **Mr. Dhiraj Solanki, I/C Principal, SMIT** for their guidance and patience throughout this project and also for helping us understand many issues during different phases of project and giving permission for developing our **GAME DEVELOPMENT PROJECT.**

We are extremely thankful and indebted to our classmates for being helpful throughout this whole project, for their help and support, and motivating. Without them also this project would have been impossible.

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INTRODUCTION

INTRODUCTION

DIMENSIONAL RANDOM VOID-VERSE is PC game for the players who want to explore the new world and want some adventure with new challenges. This game is generally designed for the gamers. As we all know games can reduce stress and anxiety. **Dimensional Random Void-Verse** consists different modules such as 3 Different modes (Battle Royal, Adventure, and Survival), Armory, Abilities, Crafting Items, Chat & VOIP, Random map generation.

Player can select any mode and can play the game. Playing with friends is only available in the Battle Royal Mode. In Adventure mode player have to complete the tasks and it'll give him experience point which helps in advancing level. For testing purpose Battle royal now only can be played by 8 players only but in future Battle Royal will be available for 60 players in one map and player can form team by inviting 2 other friends. So basically, Battle Royal map will have 20 teams in a single match. In survival mode player have to survive from the enemies spawned by the game itself.

Players can communicate while playing the game by using Chat System, VIOP. This both chat system & VIOP will only be available in the Battle Royal. Players can unlock different abilities and can equip and make guns/Weapons. In today's world gamer play in the same map over and over so for that reason our game will generate the map randomly so player has to come up with different strategies every time.

ORGANIZATION PROFILE

ORGANISATION PROFILE

Name: Thunder Game Studio

Address: Office No 15 - Top Corner, Second Floor, Commerce College Rd, above La Pinoz Pizza, Bhuj, Gujarat 370001

Thunder Game Studio is a leading game development and designing company from India since 2016 focused on the large mobile consumer emerging markets like Google play-store, Apple iTunes, Windows market and more. The main mission of Thunder Game Studio is to offer billions of first-time mobile gamers across emerging markets a curated, innovative mobile gaming service where they can play & have fun with their friends.

The vision of Thunder Game Studio is to generate billions of smiles on mobile devices anytime, at any place across millions of players in emerging gaming field.

Website: <https://www.thundergamestudio.com/>

Email: info@thundergamestudio.com

IG: [thunder_game_studio](#)

YOUTUBE: <https://www.youtube.com/c/ThunderGameDevelopmentStudio/channel>

EXISTING SYSTEM

EXISTING SYSTEM

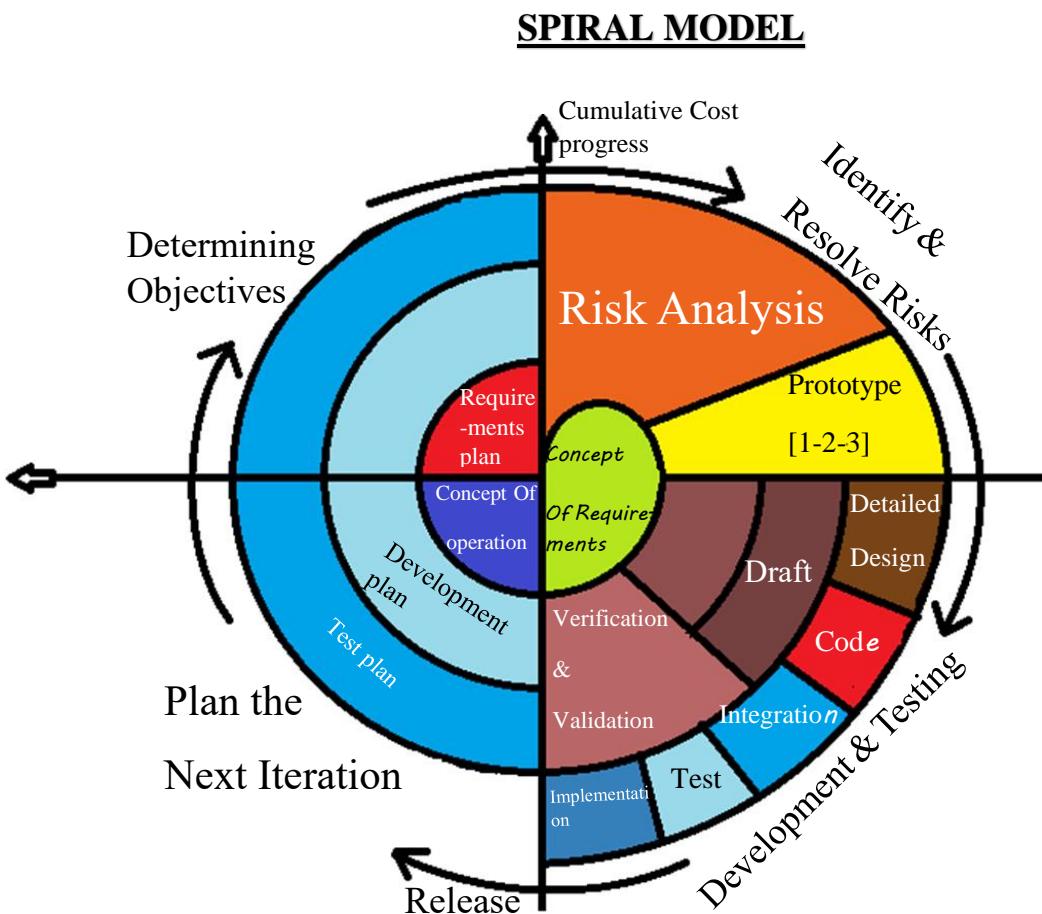
- Most of indie game developers start making 2D platformer games so we decided to make a 3D game.
- Battle Royal mode is trending on every platform so we decided to add that in our game with survival and adventure mode.
- VoIP is now almost mandatory for player to communicate so we added that feature in our game.
- In game chat is also a common feature so we have that feature in our game.
- We studied that players lose their interest gradually after playing on the same map so to eliminate that problem we decided to generate map randomly whenever player enters survival mode.
- Most of MMORPG (Massively multiplayer online game) have TDM (Team Death Match) mode so we also have that in our game.

PROBLEM AREA & NEED FOR THE NEW SYSTEM

PROBLEM AREA & NEED FOR THE NEW SYSTEM

- Playing on the same map for the long time can be boring but our game will not face this kind of problems as our map is procedural and which keeps changing every time players enters in the game.
- Many players have to change games because they want to play different genre game like if player just finished battle royal and now he/she wants to play adventure then he/she has to switch to new game which can be time consuming but our game will give you 3 modes in one single game.
- With the help of terraforming player can manipulate the terrain, map and the environment. Player can dig the hole or can make change in the size of the map around him/her.
- Gaming day to day improving and it needs new features so we will also provide in game abilities where player can have some special skills than remaining other player.

PROPOSED SYSTEM



Why we used Spiral Model in our Project:

The spiral model enables gradual releases and refinement of a product through each phase of the spiral as well as the ability to build prototypes at each phase. The most important feature of the model is its ability to manage unknown risks after the project has commenced.

The spiral model combines the idea of iterative development with the systematic, controlled aspects of the waterfall model. This Spiral model is a combination of iterative development process model and sequential linear development model i.e. the waterfall model with a very high emphasis on risk analysis. It allows incremental releases of the product or incremental refinement through each iteration around the spiral.

A risk driven software development process model which adopts elements of one or more process models, such as incremental, waterfall, or evolutionary prototyping. Game development is the art of creating games describing the design, development, and strategy to release the game. It also includes concept generation, builds, design, and test. While you are creating a game, you should also take care of the game mechanics, player engagement, rewards, and level design. Game development is a flexible niche and can be commenced by a big game development studio or even by a single individual. As long as you have the skills to create a game that enables the user to interact with the content and can manipulate the game's elements, it is a game.

The Various phases of Spiral Model:

- ❖ **Planning:** The planning phase of the spiral model commences by collecting the feature requirements in the baseline spiral. This phase of the spiral model involves the elimination of costs, scheduling, and resources for the iteration.
- ❖ **Design:** After planning and identification, the next one is the design phase. It begins with an easy mind mapping within the initial spiral and including the architectural design, logical layout of modules, and therefore the physical product prototype within the subsequent spiral.
- ❖ **Construction:** The production of the software product at every iteration level is known as the build stage. When the software, in the baseline cycle, acts as just an idea of the design to be considered as a prototype happens in this stage to learn from the client's experience. A working copy of every software product (also known as a build) is delivered with a proper version in the ensuing spirals with higher clarity on requirements and design specifications. Finally, then it is provided to the clients for their inputs.
- ❖ **Evaluation and Risk Analysis:** The risk analysis encompasses classifying, observing, and measuring the technical viability along with the business risks like schedule impact and cost escalations. Once the examination of the build is finished, the customer is then able to assess the software and give their valuable feedback during the end of the first repetition.

DEVELOPMENT TOOLS & TECHNOLOGIES USED



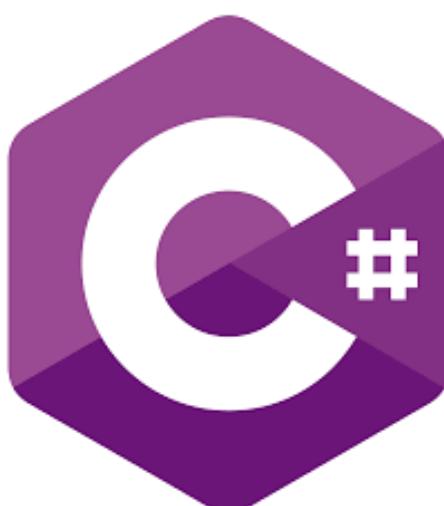
Unity:

Unity is a cross-platform game engine initially released by **Unity Technologies**, in 2005. The focus of Unity lies in the development of both 2D and 3D games and interactive content. Unity now supports over **20** different target platforms for deploying, while its most popular platforms are the PC, Android and iOS systems.

Unity features a complete toolkit for designing and building games, including interfaces for graphics, audio, and level-building tools, requiring minimal use of external programs to work on projects.

C#:

The language that's used in Unity is called C# (pronounced C-sharp). All the languages that Unity operates with are object-oriented scripting languages. Like any language, scripting languages have syntax, or parts of speech, and the primary parts are called variables, functions, and classes.





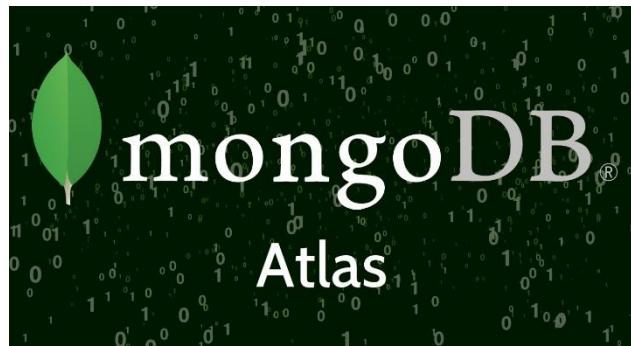
ADOBE :

Used to create simulated UI & its elements. Adobe XD is a vector-based user experience design tool for web apps and mobile apps, developed and published by Adobe Inc. It is available for macOS and Windows, although there are versions for iOS and Android to help preview the result of work directly on mobile devices.



BLENDER :

Blender is a free and open-source 3D computer graphics software toolset used for creating animated films, visual effects, art, 3D printed models, motion graphics, interactive 3D applications, virtual reality, and computer games



mongoDB Atlas:

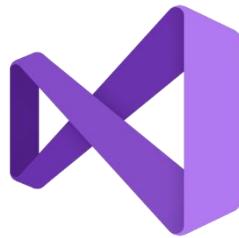
Database-as-a-Service (DBaaS) is a service that allows you to set up, deploy, and scale a database without worrying about on-premises physical hardware, software updates, and the details of configuring for performance. With DBaaS, a cloud provider does all that for you—and gets you up and running right away.

MongoDB Atlas is a fully managed cloud database that handles all the complexity of deploying, managing, and healing your deployments on the cloud service provider of your choice (AWS, Azure, and GCP). MongoDB Atlas is the best way to deploy, run, and scale MongoDB in the cloud. With Atlas, you'll have a MongoDB database running with just a few clicks, and in just a few minutes.



Node JS :

Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser. Node.js lets developers use JavaScript to write command line tools and for server-side scripting—running scripts server-side to produce dynamic web page content before the page is sent to the user's web browser. Consequently, Node.js represents a "JavaScript everywhere" paradigm, unifying web-application development around a single programming language, rather than different languages for server-side and client-side scripts.



VS Code :

Visual Studio Code is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add additional functionality.



PHOTON :

Photon Unity Networking (PUN) is a Unity package for multiplayer games. Flexible matchmaking gets your players into rooms where objects can be synced over the network. RPCs, Custom Properties or "low level" Photon events are just some of the features. The fast and (optionally) reliable communication is done through dedicated Photon server(s), so clients don't need to connect one to one.

SYSTEM FEATURES

3 DIFFERENT MODES:

1. **Battle Royal:** Players have to defeat other real players in order to win. Different weapons will be available in this mode. Battle royal can be played with friends too and also have VoIP and in game chat system.
2. **Survival:** In this mode player have to survive against the environment of the game. Players can make their own weapons and can acquire different abilities. This mode is single player so player can't play with friends in this mode.
3. **Adventure:** Player have to explore the map and have to fight with different bosses and have to complete quest in order to win.

PROCEDURAL GENERATED WORLD:

When user will input seed a world will generate with environment which contains fierce full enemies and vegetarian (trees plants). The map will be generated randomly by process or code in backend in c#. Playing on same map gets boring gradually so for that we added this feature to our game so player won't get bored and player have to come up with different strategies in order to win the game.

Armory, Abilities, Inventory:

Player can equip different guns in the Battle royal mode to fight against the enemies which is real players so the battle royal mode is PVP so player can use guns provided by the game itself.

Abilities like Hydrolic strike which releases strong flow of water in the same direction with high pressure, Ice spear ability help in throwing sharp ice spears at target , Tricky thunder will allow player to generate shock waves at target.

Chat System :

If player wants to interact with other player or teammate by using chat message by typing text in the chat box area. Chat system is very common feature in nowadays gaming world and it's easy to use. Player can chat with other person or can send message to other player by just typing it and hitting send.

Voice Over Internet Protocol(VoIP) :

Player can chat with each other like they do on voice call by using VoIP feature of the game. Chat system which includes typing message sending is easy but VoIP is easier than that. With the help of VoIP player can chat with each other by speaking.

As a gamer playing and typing message in the chat box is very hard and time consuming so VoIP is added as it makes communication easy and very fast

AI enemies & Interactive companion :

In the survival and adventure mode the enemies will be of the game. So survival and adventure are PVE modes so the enemies of that mode won't be the players but they will AI enemies that are already in the game. The enemies will be like bosses or small creatures etc.

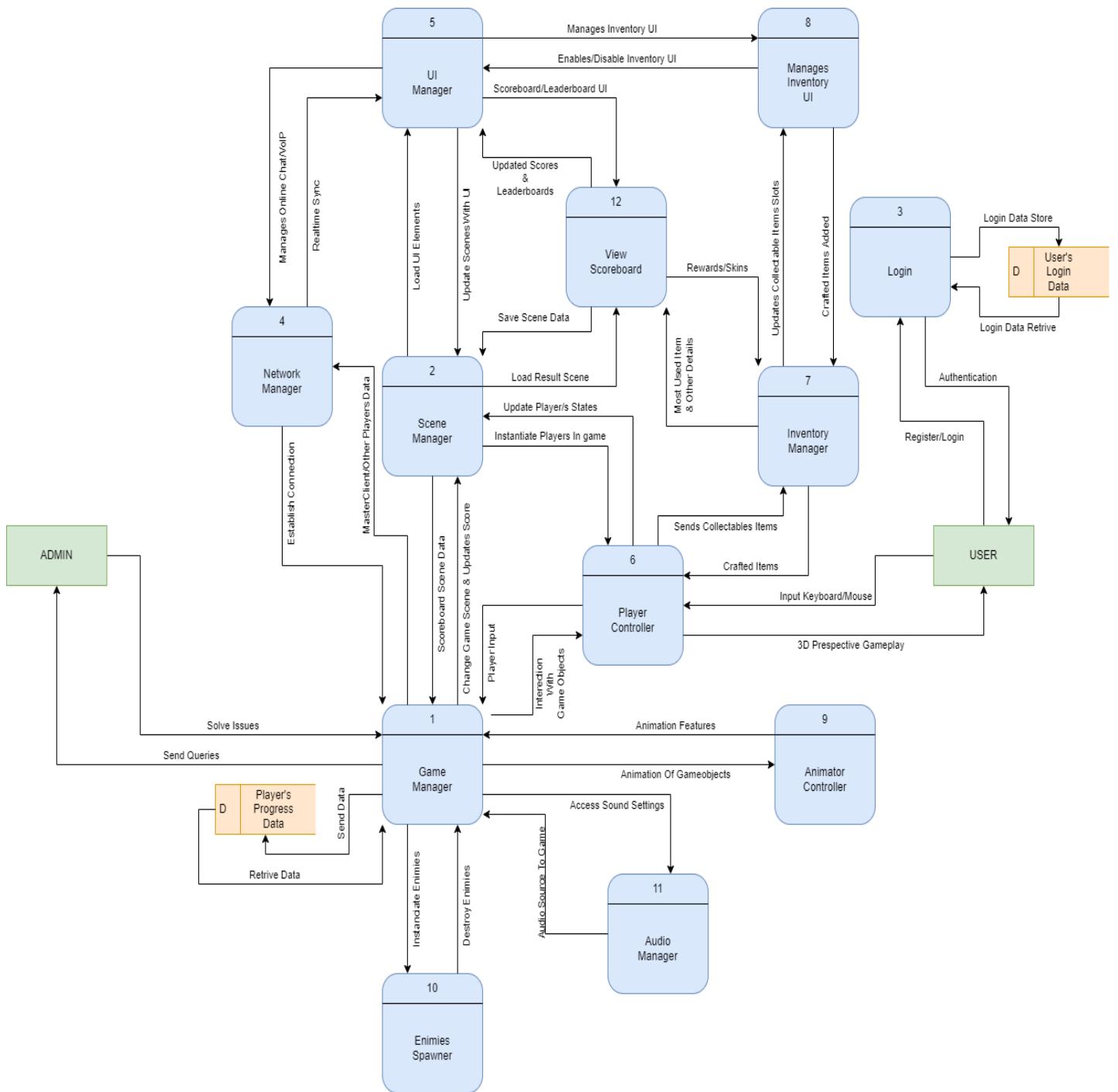
Team Death Match :

Its mode with small map where only 2 teams fight and the one with more points in given time will be the winner of the match. In the gaming world of today this mode is very much played by the players so because of that reason we added TDM in our game so that player can enjoy this with other 3 modes.

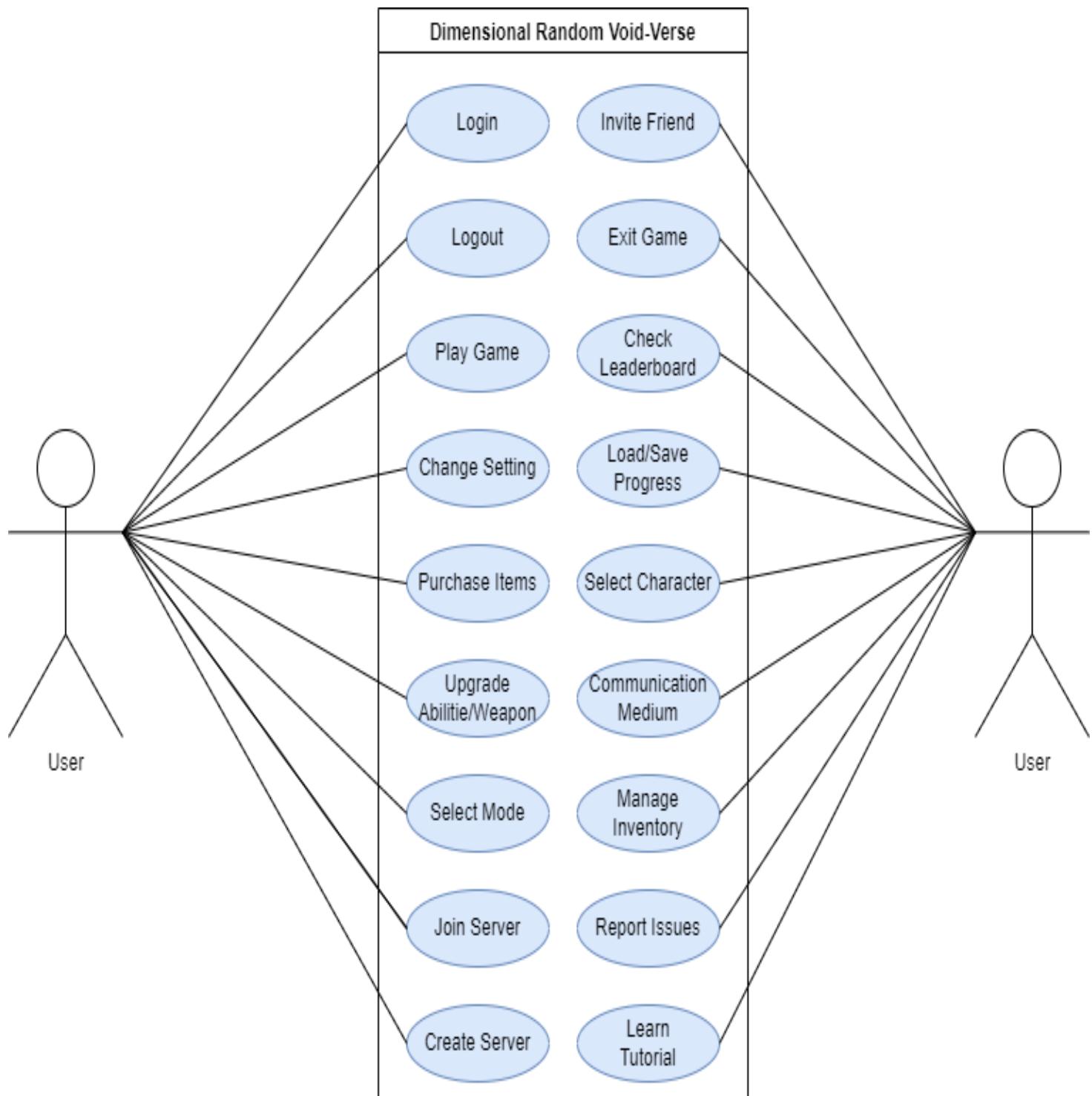
DATA FLOW DIAGRAM



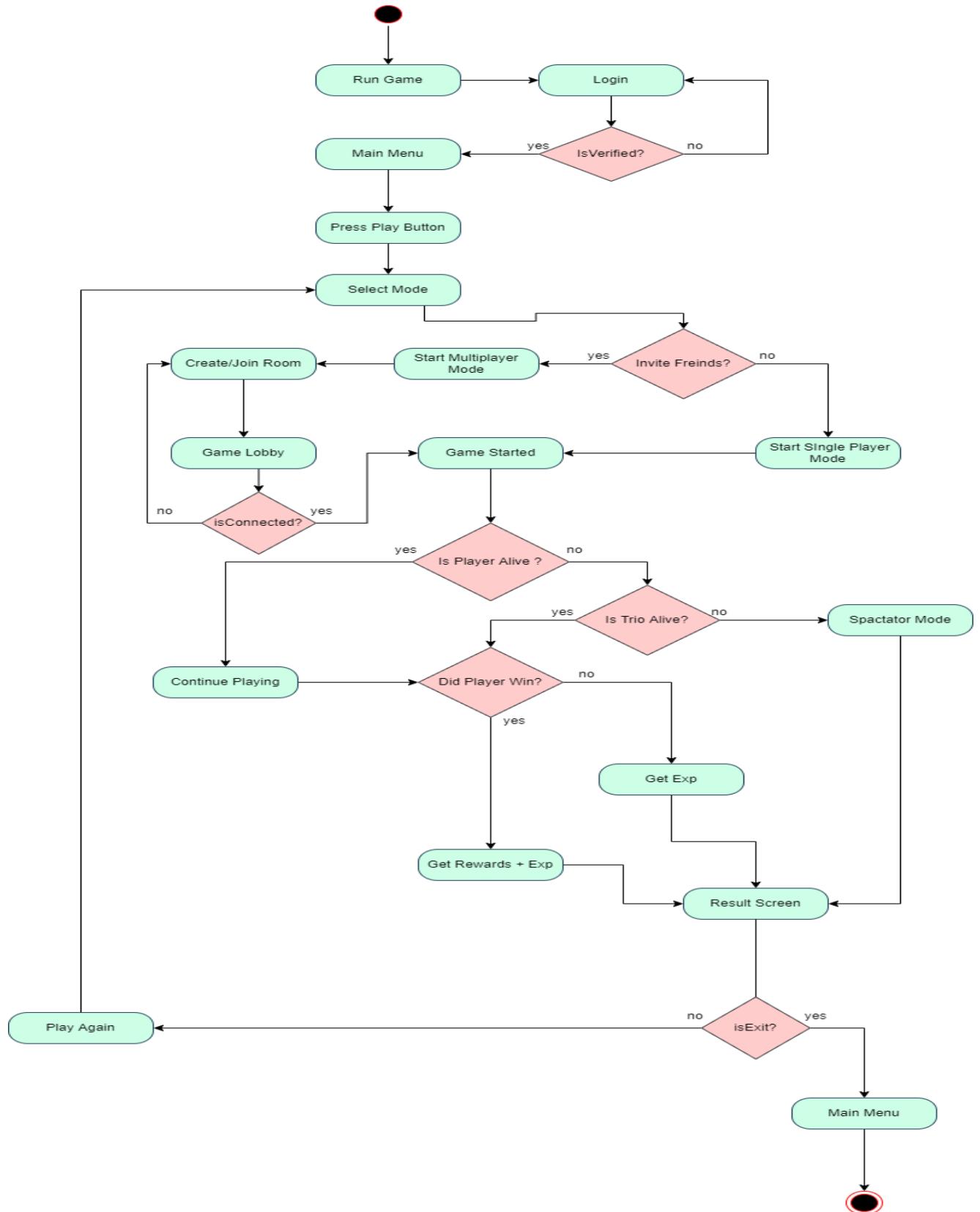
2. LEVEL 0 :



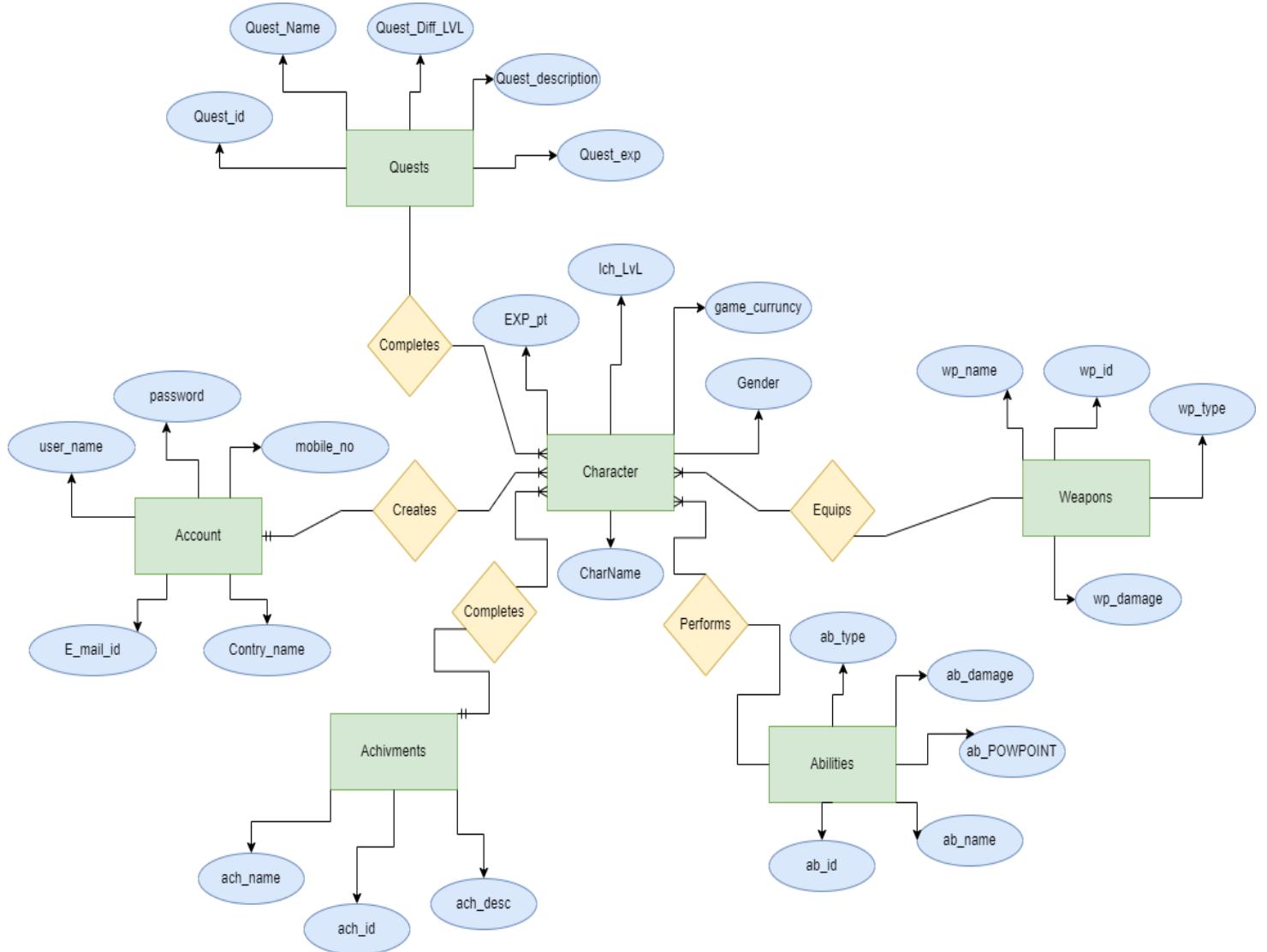
USE-CASE DIAGRAM



ACTIVITY DIAGRAM :



ENTITY-RELATION DIAGRAM :



DATA-DICTONARY

1. Log In

```

1 _id: ObjectId("62283e872f18313da4ea3998")
2 username : "DRV"
3 password : "$argon2i$v=19$m=4096,t=3,p=1$1eaWdKH2av/TTk5HYVMLId5V749v1NIM63sTY6/bw7I$OBMDiEvXTkxhTRSXoMi0no4o"
4 salt: String
5 lastAuthentication: 2022-03-09T05:44:44.722+00:00
6 __v: 0

```

_id	ObjectId
username	String
password	String
salt	String
lastAuthentication	Date
__v	Int32

2. Abilities

```

1 _id: ObjectId("6214854d8a168fd95fc689a")
2 Ab_id : "A01"
3 Ab_name : "Ability 01"
4 Ab_POWPOINT : 200
5 Ab_damage : 200
6 Ab_type : "Chara"

```

_id	ObjectId
Ab_id	String
Ab_name	String
Ab_POWPOINT	Int64
Ab_damage	Int64
Ab_type	String

3. Achievements

```

1 _id: ObjectId("6214825f8a168fd95fc6894")
2 Ach_name : "ach123"
3 Ach_id : 101
4 Ach_desc : "Muskuraiye aap Sanskar mein hain"

```

_id	ObjectId
Ach_name	String
Ach_id	Int32
Ach_desc	String

4. Quest

```

1 _id:ObjectId("621484408a168fda95fc6897")
2 Quest_id :"Q01"
3 Quest_name :"Epic Quest"
4 Quest_diff_lvl : 12
5 Quest_desc :"This is very aghara Quest"
6 Quest_exp : 200

```

ObjectId
String
String
Int64
String
Int64

5. Weapons

```

1 _id:ObjectId("621483b58a168fda95fc6896")
2 Wp_id :"Weap01"
3 Wp_name :"M416"
4 Wp_type :"AR"
5 Wp_damage : 400

```

ObjectId
String
String
String
Int64

6. Abilities

```

1 _id:ObjectId("6214854d8a168fda95fc689a")
2 Ab_id :"A01"
3 Ab_name :"Ability 01"
4 Ab_POWPOINT : 200
5 Ab_damage : 200
6 Ab_type :"Chara"

```

ObjectId
String
String
Int64
Int64
String

LOGIN LAYOUT



Player has to login/Register in order to proceed further and to play the game. Without login player cannot play the game so this mandatory.

MAIN SCREEN



After login this MAIN SCREEN will come from this player can play the game or can change the setting from the options or can quit the game and also player can logout and see profile of the user.

3 DIFFERENT MODES



Player can select the mode he/she wants to play. TDM is available in the Battle Royal mode.

OPTIONS



In the options section player can change the settings related to graphics and also change the Control and game setting.

GAME SETTINGS



In the Game Settings section player can increase or Decrease Brightness, Music, SFX etc.

LEVEL 1 ADVENTURE



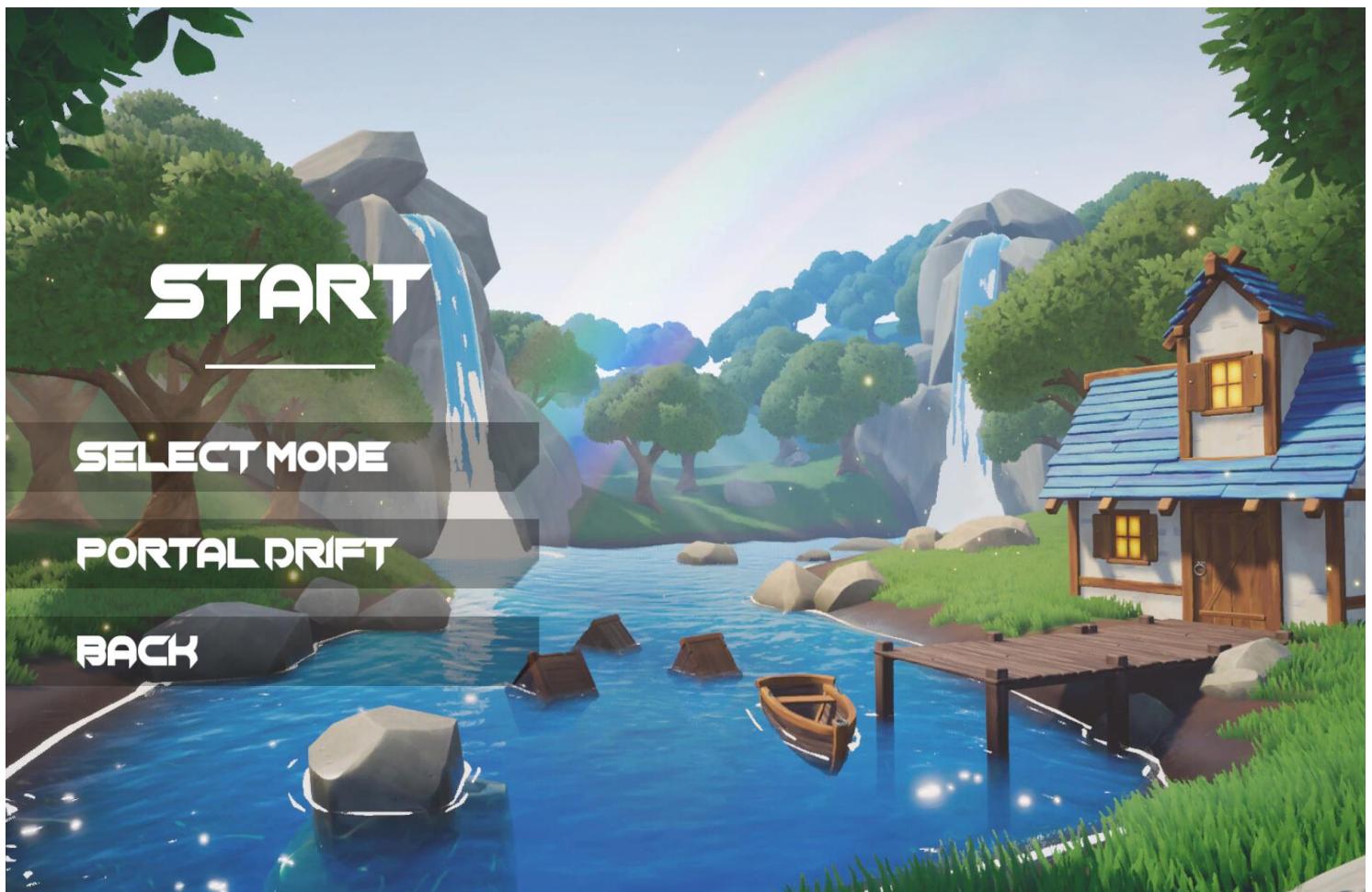
In Level 1 Adventure player can experience the post-apocalyptic environment.

LEVEL 2 ADVENTURE



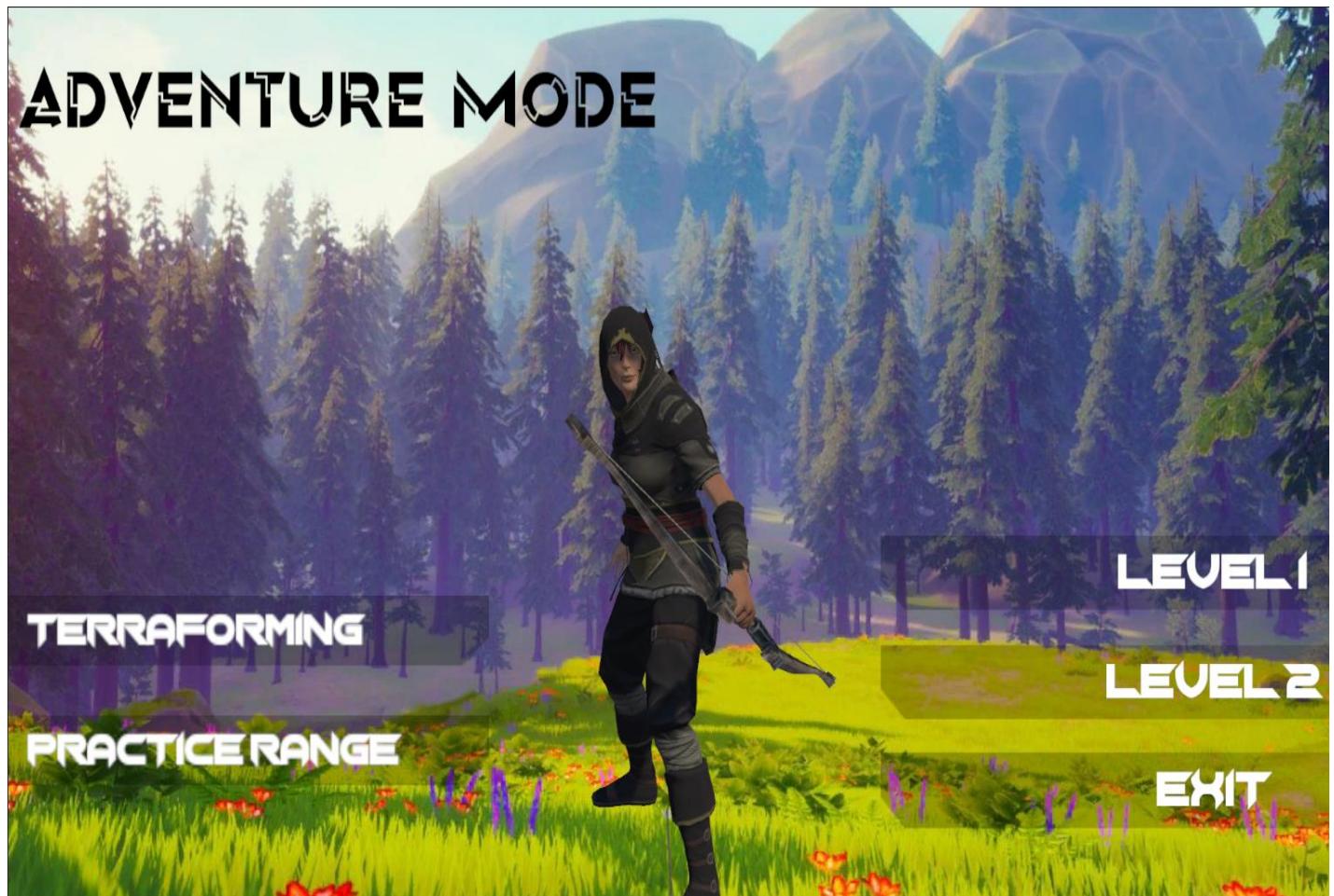
In Level 2 Adventure player can play as ancient era environment.

START SCREEN



From the Start Screen player can go back or can go in selection mode and also can access portal drift.

ADVENTURE MODE



This is Screen of Adventure mode where player can practice or can play and also he/she can go back to select mode screen.

SURVIVAL MODE



This is the screen of Survival mode where player can play or can go back to select mode screen.

BATTLE ROYALE MODE



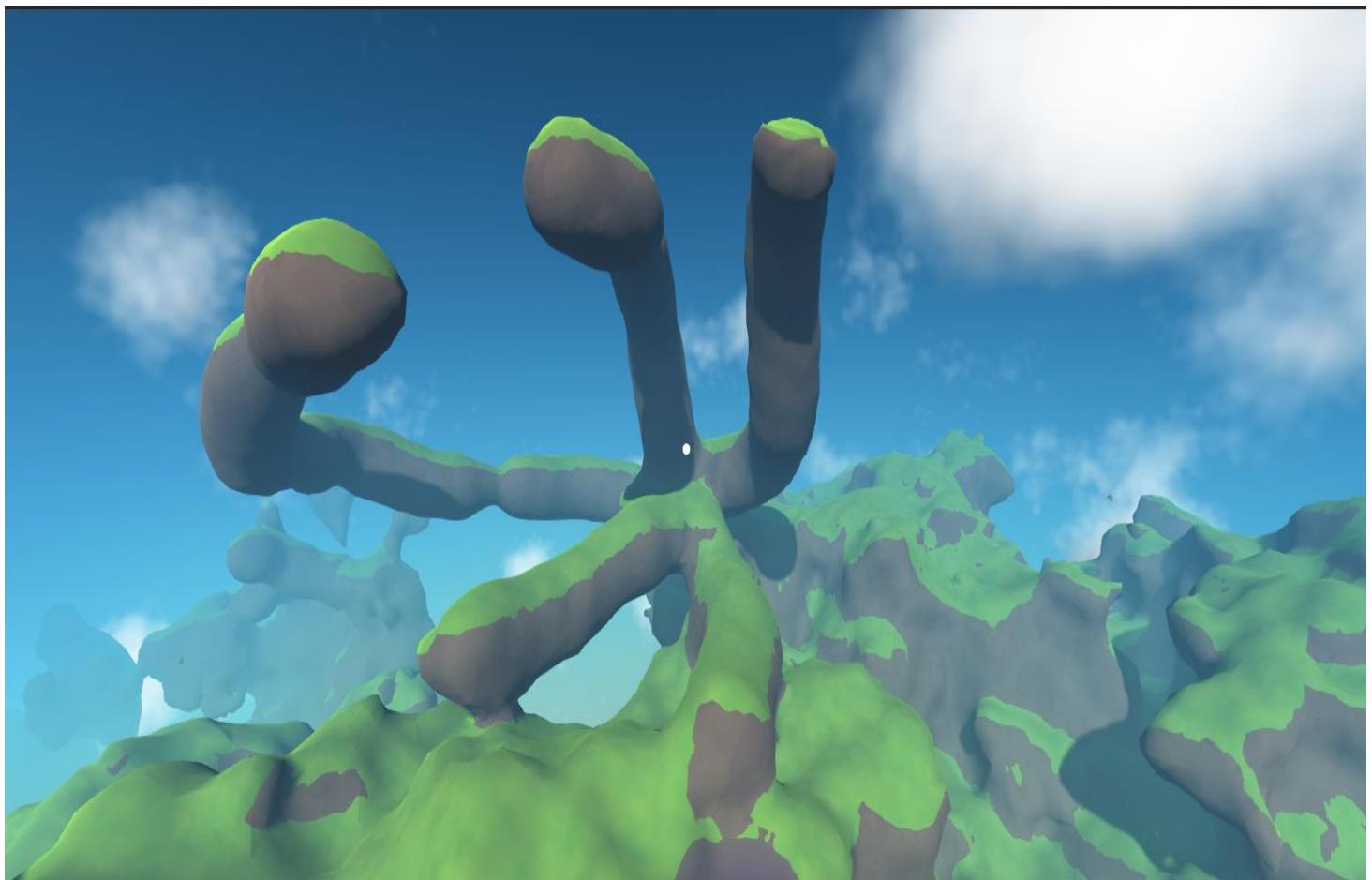
From Battle Royal Mode screen player can check Armory, scoreboard, can go to training ground or can play by going in the Connect.

ARMORY



This is how Armory screen will look in the game. Player can view different guns from this screen.

TERRAFORMING



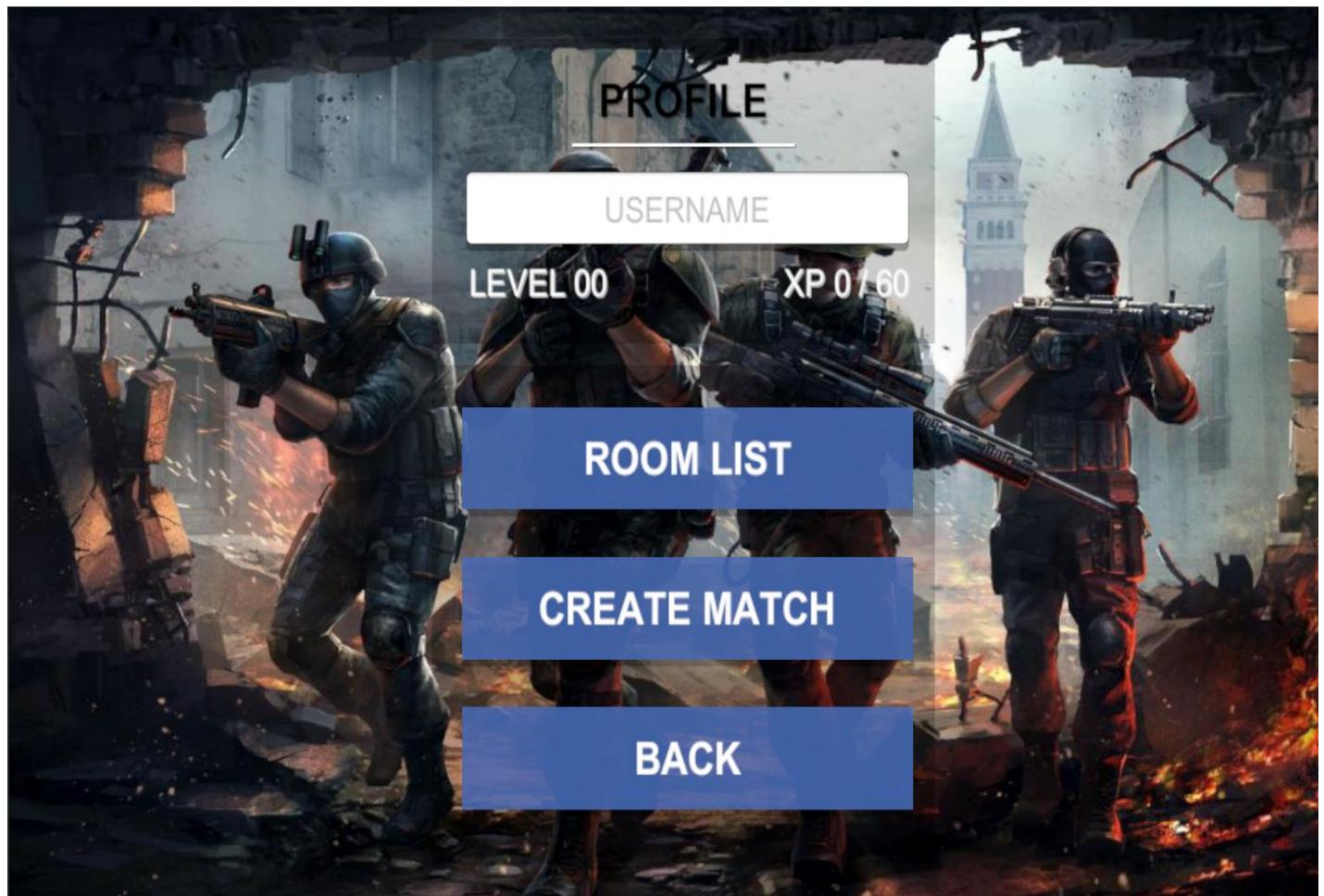
Terraforming is a new concept created by us that work on the principle of marching cube. We can manipulate the vertices of the terrain in any direction per frame.

TRAINING GROUND



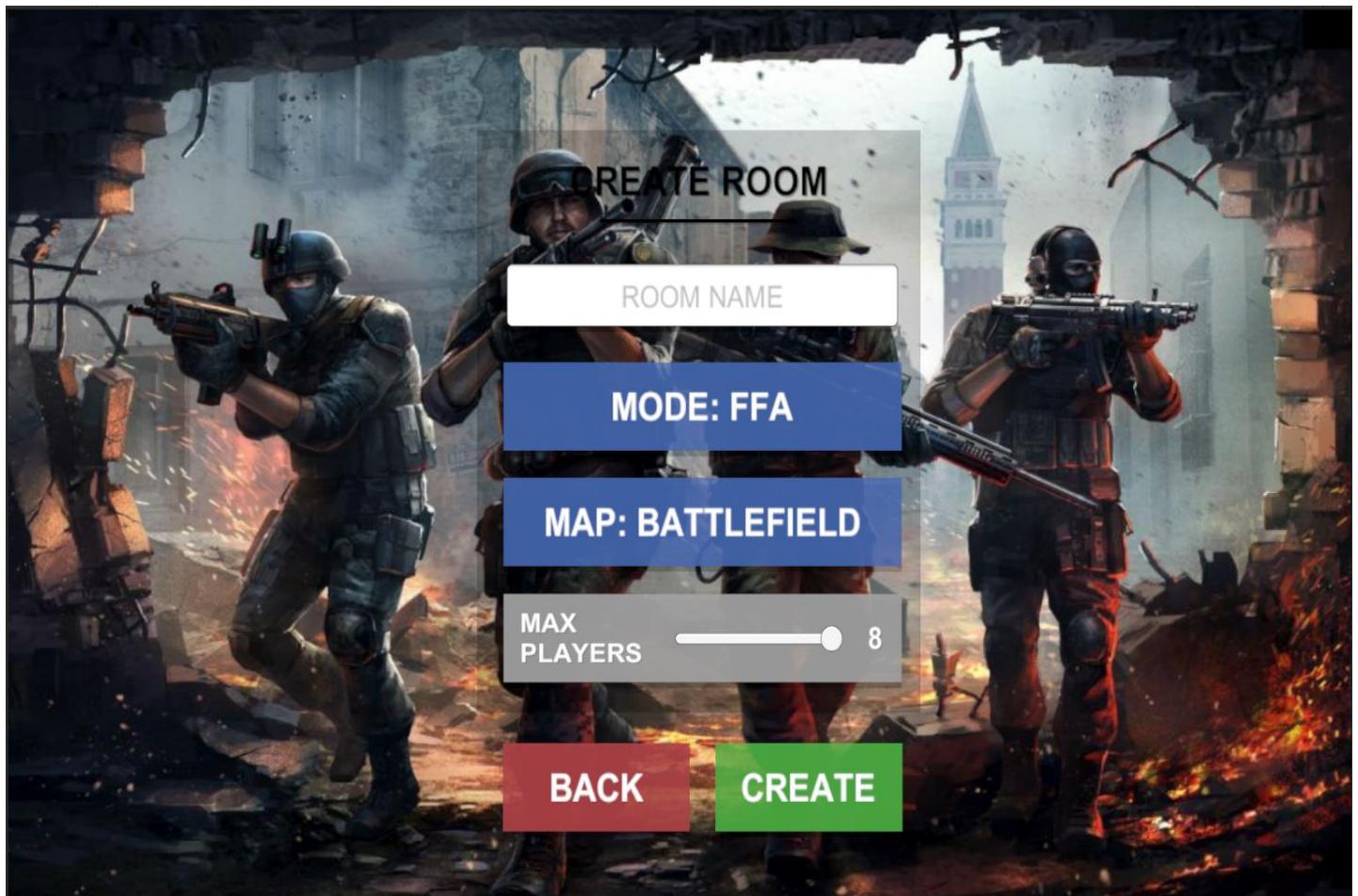
In the training ground player can practice against the bots and can develop and learn how to play or how to control the gun.

SERVER ROOM CREATION & LIST



Player can Join or create the Rooms as multiplayer Lobby

MAP SELECTION



Adjustable mode/map selection and limiting the players in a server.

QUEST



This is quest screen in which quest info will be there, player have to complete the quests for reward or experience point.

QUIT

This is Quit Screen from player exit the game and go to desktop.

PROPOSED ENHANCEMENT

- The game is for pc only for now but we are planning to launch for the mobile in the future.
- Also make it available for VR.
- May launch the game globally for the general public.
- We are planning to make random room generation with items in it.

CONCLUSION

- It can be concluded from above discussion that a game with good features which attracts the public and gamers specially.
- This game also has a room for improvement like we have mentioned in the future enhancement section. Wez would love to try to make this project as better as possible.
- Seeing the demand of gaming and its features, we have come forward with our best efforts to make better game for the gamers.
- Our game is not for any particular group as include 3 different modes which can be playable by any person and all the modes are easy not too hard.
- It was very amazing, wonderful and learning experience for us while working on this project so we hope our game will be adaptable for the users.

BIBLIOGRAPHY

Following are the references:

- o <https://www.youtube.com/playlist?list=PLPV2KyIb3jR5QFsefuO2R1AgWEz6EvVi6>
- o <https://www.youtube.com/watch?v=BLl32FvcdVM>
- o <https://www.youtube.com/watch?v=WNtZOJkeFJY>
- o GitHub
- o Discord
- o <https://www.stackoverflow.com>
- o <https://www.mongodb.com/basics/mongodb-atlas-tutorial>
- o <https://docs.unity3d.com/Manual/index.html>
- o <https://nodejs.org/en/docs/>
- o <https://www.mongodb.com/docs/>