# ANALYSIS REPORT

Submitted to:
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Project 5 Section 1

FIREBALL MAC-Winter 2022

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## Project Features

1. **Room**: It is defined as a virtual session where at most 2 people can connect using proton DB. The code must be generated by one of the game participants and the room code must be communicated to other game participants explicitly.
2. **Action Reflection**: When the players are in a room, their score and body movement will bereflected on each game participant's screen.
3. **Avatars**: For the detected body in the video feed, the face can have a filter from a given listof filters already provided by the game. Each individual face filter is termed an Avatar. The number of avatars is limited to 10.
4. **Modes:** The game will provide three modes of play:
   a. **Single Player**: This mode is defined as one person playing the game standing insidethe bounds of the camera frame.
   b. **Multi-Player (Online)**: This mode is defined with a maximum of 2 people joining into 1room and playing together. Action Reflection will perpetuate among all the participants.
   c. **Multi-Player (Random)**: This mode is an extension of (b) and is defined by the pairing ofa user with another user randomly online.
   d. **Party Mode (Local Multiplayer)**: This mode is defined with a maximum of 2 peoplestanding within the camera frame and playing the game together.
5. **Falling 3D Objects:** There are two kinds of 3D objects falling from the top of the game screen, one is the fireball and the other is the coin. The 3D objects fall randomly at a random pace.
6. **Rewards:** The Reward System displays the score of the player on top of the game screen. Whenever the player collects the coins, the score is incremented by 1.
7. **Menu**: The menu of the game is defined as the options visible to the user where he cannavigate to choose the game mode, create a room, see the high score, and choose an avatar.

## Project Scope

The scope of the project is implementing the project features on an Android platform in a timeline of 4 Sprints.

## Project Stakeholders

The main stakeholders of the project are

1. Customer: Ms. Shivani Kapadia
2. Project Director: Ms. Simranpreet Kaur
3. The Development Team

## Analysis of Gap

### Successes

The Project development sprints were successful in the following features

1. Creating and integrating Single player mode for the game.
2. Integrating falling objects models from blender
3. Creating Multiplayer Online mode.
4. Creating Customized face masks for the game

## Incomplete Tasks

The development team couldn't complete the following features

1. Integrating Multiplayer Online mode
2. Creating and integrating Party Mode
3. Integrating customized facemasks in the game.

## Analysis of Successes and Failures

The project was developed using the Agile software engineering philosophy and based on the principles in each iteration the team tried to prioritize minimizing risks and developing the leanest deliverable first. The start and end of each iteration posed with the following risks:

### Sprint 1

**Risks at the start of the Sprint**

1. No Knowledge of Unity
2. No Knowledge of Blender

**Successes at the end of the Sprint**

1. Blender created 2 facemasks
2. Game mechanics for Single Player working in Unity in 2 different executables
3. Face Swipe feature working

**Risks at the end of the Sprint**

1. Integration of executables and face swap to complete Single Player mode

At the end of Sprint 1 the team realized that integration that they are getting a hold of Unity and they are a bit confident in working in it.

### Sprint 2

**Risks at the start of the Sprint**

1. Integration of executables and face swap

**Successes at the end of the Sprint**

1. 2 more Blender facemasks

**Failures at the end of the Sprint**

1. Integration did not happen in one sprint

**Risks at the end of the Sprint**

1. Integration of executables and face swap

At the end of Sprint 2 the team concluded that integration of game mechanics and face swap is not simple. It required more knowhow and experience and hence decided to take 2 steps

1. All the resources should come together and put in more hours to collaborate work together in integrating Single Player Mode

### Sprint 3

**Risks at the start of the Sprint**

1. Integration of executables and face swap

**Successes at the end of the Sprint**

1. Integration was successful

**Risks at the end of the Sprint**

1. Multiplayer online mode
2. Game crashed after every 3-4 seconds of playing.

The team triumphed with the strategy of putting in more collaboration time to integrate the single player mode and moved forward with driving down the next risk of multiplayer mode.

### Sprint 4

**Risks at the start of the Sprint**

1. Multiplayer online mode
2. Game crashed after every 3-4 seconds of playing.

**Successes at the end of the Sprint:**

1. Game worked smoothly on a 10-minute test play.
2. Multiplayer online mode worked using a photon server

**Risks at the end of the Sprint**

1. Party mode
2. Integrating Multiplayer Online mode

## Result of Sprints and Future Works

At the end of Sprint 4 the team was very confident about their skills and hold of Unity project development, the major risks of core component have been driven down and the developed deliverables are valuable to the customer as they have all the core features except party mode. One major failure due to lack of experience was planning the sprints properly there was always more on the plate than what could have been completed.

The future works from here would be integrating the multiplayer mode, developing party mode and creating a menu for the game. From the lifecycle perspective investing money on bringing the team together at one place would be an improvement. Other improvements would be hiring an expert Unity Developer who could break the tasks in a way that they would be easily integrated.

## Tasks Status

| Sr No. | Task Id | Task Description | Status |
|---|---|---|---|
| 1 | CP8117P15-1 | Single-Player Mode for the game | done |
| 2 | CP8117P15-2 | Rewards System for the game | done |
| 4 | CP8117 P15-4 | Research and learning on multiplayer online game development. | done |
| 5 | CP8117P15-5 | Party Mode | Pending |
| 10 | CP8117 P15-10 | Falling ball Mechanics | done |
| 12 | CP8117 P15-12 | Making 3d model design of fireball | done |
| 13 | CP8117 P15-13 | Making 3d model design of coin in blender | done |
| 15 | CP8117 P15-15 | Face Tracking | done |

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|---|---|---|---|
| 16 | CP8117 P15-16 | Integrating Falling Object with Face Tracking | done |
| 17 | CP8117 P15-17 | 3D Avatar creation | done |
| 19 | CP8117P15-19 | Creating and Integrating Face Mask | Pending |
| 24 | CP8117P15-24 | Game crashes after every 2-3 seconds | done |
| 25 | CP8117P15-25 | Multiplayer Mode | Pending |
| 27 | CP8117P15-27 | Create Menu for the game | Pending |

## References

[1] SRS document of Fireball project.

[2] Sprint all document submitted