

GAME DESIGN DOCUMENT





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Title of the game: "Virulent Addiction"

Genre: Fighting / Beat'em up

Mode: Multiplayer (2-4) online 2D

Story type: Linear story

Platform: Mobile (Android)

Academic year: 2017-2018

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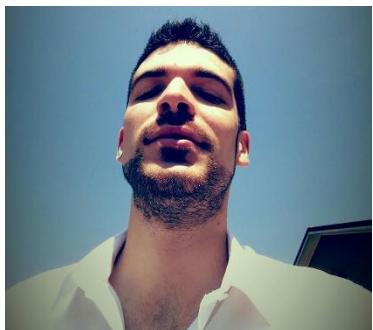
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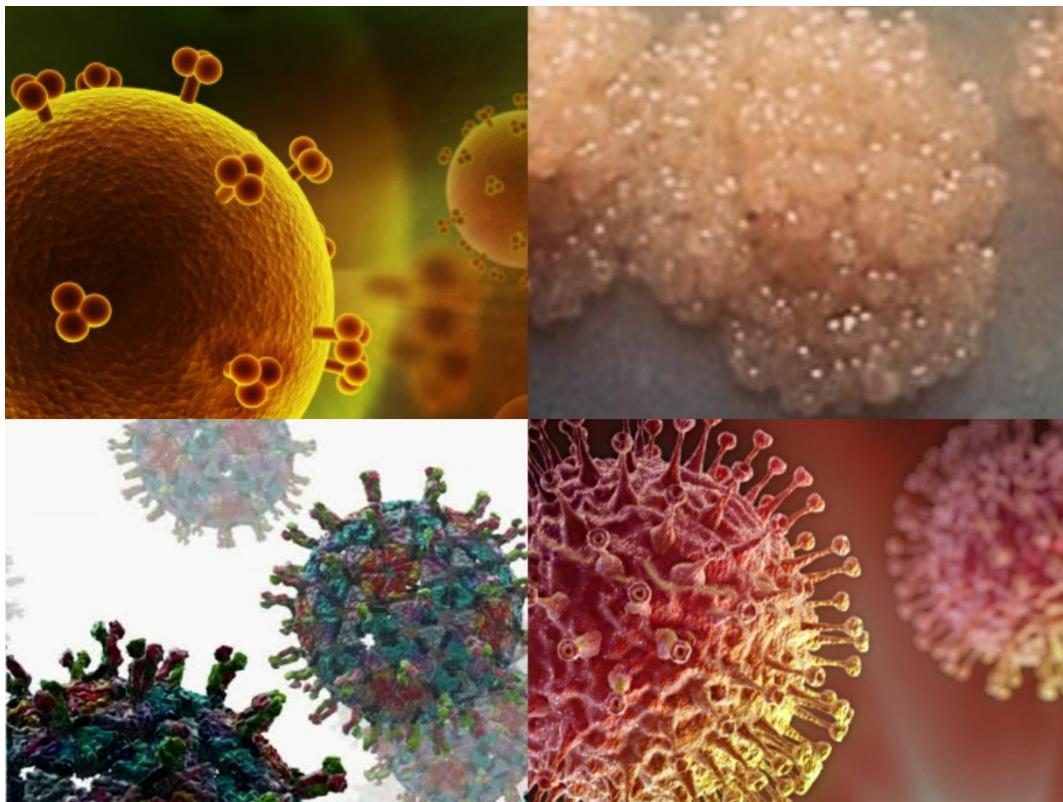
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1 DESIGN HISTORY

When	What
15 March 2018 to 26 March 2018	<p>First draft of:</p> <ul style="list-style-type: none"> - World environment - Player characters - Enemies <p>Understanding:</p> <ul style="list-style-type: none"> - Platforms capabilities - Target audience <p>First draft of:</p> <ul style="list-style-type: none"> - Gameplay core mechanics - Reward system
D0: CONCEPT MILESTONE	
27 March 2018 to 6 April 2018	<p>First draft of:</p> <ul style="list-style-type: none"> - Network modules - Player's HUD - Game's menus - Character customization - SFX and music concept <p>First implementation of:</p> <ul style="list-style-type: none"> - Gameplay core mechanics - Enemies - World level - Rewarding system
D1: GDD 1.0 MILESTONE	
7 April 2018 to 7 May 2018	<p>First draft of:</p> <ul style="list-style-type: none"> - NPCs behaviour - In-game market <p>Implementation of:</p> <ul style="list-style-type: none"> - Network modules - Player's HUD - Game's menus - Character customization <p>Changes made:</p> <ul style="list-style-type: none"> - Restricted the platforms pool to Android mobile platform and networking sub-modules to Google Play services <p>Definition of:</p> <ul style="list-style-type: none"> - Game modes flowchart - Personas according to our target audience

	D2: GDD 2.0 + GTD 1.0 MILESTONE
8 May 2018 to 30 May 2018	<p>Implementation of:</p> <ul style="list-style-type: none"> - NPC's decision tree - C# classes to handle the multiplayer packages' exchange - Roadblocks in the gameplay <p>Definition of:</p> <ul style="list-style-type: none"> - Develop costs evaluation <p>Change made:</p> <ul style="list-style-type: none"> - NPC's behaviour due to a few tests - Player's playability - PCs' and NPCs' stats <p>First draft of:</p> <ul style="list-style-type: none"> - Our final boss (the princess)
D3: GTD 2.0 MILESTONE	
31 May 2018 to 15 June 2018	<p>Implementation of:</p> <ul style="list-style-type: none"> - Other roadblock and gatekeeper - All sound effects <p>Change made:</p> <ul style="list-style-type: none"> - Introduction of hordes - New GUI <p>Definition of:</p> <ul style="list-style-type: none"> - SFX and music concept
D4: GDD + GTD + storyboard (FINAL) MILESTONE	

2 VISION STATEMENT

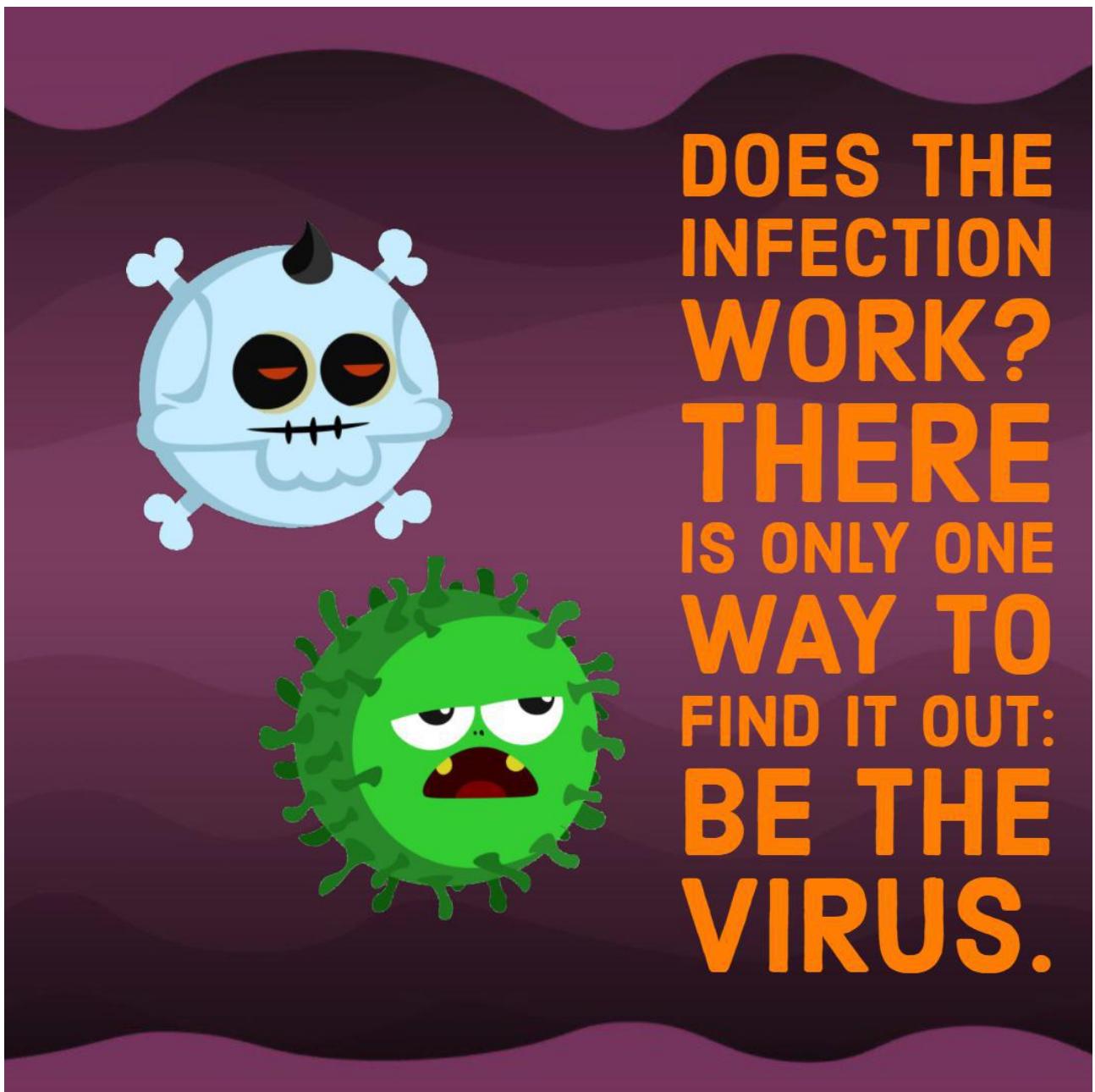


VISION STATEMENT

Virulent Addiction is a 2D Fighting / Beat'em up game in which the player controls a virus in order to infect and kill the host creature. The player will chose a type of virus featured by its special ability and election organs (e.g.: a rinovirus will affect the respiratory tract) and deciding if facing the defenses alone or with a team of other 3 players (at most). Then the player will engage an heartbreaker battle against the host's immune system, facing carbon dioxide roadblocks, white globes, pills, vaccines and finally, The Princess, the last rampart between the victory or the defeat.

See Chapter 8.1 for more details

2.1 Game Logline



2.2 Gameplay Synopsis

Virulent Addiction is 2D Fighting / Beat'em up game developed for mobile platforms running Android, playable in singleplayer or multiplayer (2 – 4) mode.

The player can choose a type of virus related to its specific election organs (from skeleti, respiratorium, digestive, nervous) and featured by a special ability (e.g.: nervous viruses has the electric discharge ability). Once the player has chosen the virus, he/she can play in singleplayer

or multiplayer mode (the latter only if the player has performed at least one singleplayer play), controlling the virus in a PCG environment that represent a specific host's body part (e.g.: an artery for the cardiovascular system, rather than a bronchiole for the respiratory system).

When the game starts, the player will face several enemies, performing melee-combo attacks rather than using a long-range weapon or using his/her virus' special ability. Moreover, in the environment, roadblocks and gatekeepers will slow down the pace and, if the player is playing in multiplier mode, create a sort of checkpoint where the players have to pass all together.

Resources like in-game currency, powerups and medikits are scattered in the environment: each player can collect them moving through them.

Our gameplay is focused on the overturning of the beat'em up genre, introducing mechanics aimed at our type of target audience. A classic beat'em up game generally does not include a social component, leaving everything in the hands of a single player. Virulent Addiction leads to a real multiplayer experience, allowing in the first and middle game-level's sections the cooperation among the players in order to achieve their goals and progress in game; on the other hand, in the final section during the boss fight facing The Princess, cooperation gives way to death-match style fight among the players and the boss itself, returning to the real core of these games: being the only survivor. The last player standing, in fact, is the winner of the play.

Furthermore, in specific areas of the host's body, there is a sort of guild that includes all the viruses of a specific type, and acts like a base of friends / allies where the player can develop new mortal aesthetic features for his/her virus' body, improve its special ability and loot the chests obtained in the end of a play.

Otherwise the beat'em up core mechanics like smashing everything on the screen, the importance of realizing successful combos, understanding the enemies' pattern and the linearity of the gameplay, have been kept.

For more details see [Chap 5.2](#).

3 AUDIENCE, PLATFORM AND MARKETING

3.1 Target Audience – Psychographic taxonomy

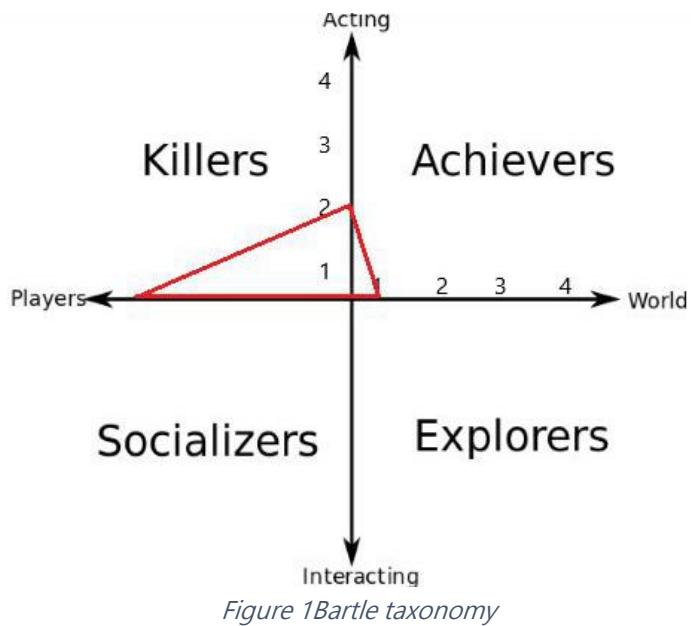


Figure 1Bartle taxonomy

We use the Bartle's taxonomy (see *Figure 1*) in order to describe our target audience, matching it with the following types of players.

- 3/4 Socializer

Since our game is mostly based on this type of audience, player social interaction is strongly encouraged. Even though the limitations of the platform, we have implemented some small but focused tricks, offering bonuses and quests only solvable playing with a friend, and each time a match with a stranger is finished, it is possible to add him to the friend list. There will be an emoji-based chat in order to interact with the other players in the match and in the dedicated players' guild.



- 2/4 Killer

Even if the shooting isn't our core mechanic, players' aggressive interaction is encouraged by several design choices. First of all, the resources are limited and players will often find themselves to fight for them; many power-ups are used to give

a temporary advantage over other players, thus a single player will become temporary overpowered. This will produce an adrenaline rush in the killer player that is strictly linked to his/her point increase, resulting in an enjoyable experience and a tangible gameplay reward. Finally, in the end section of the level, there will be a contortion of the game mechanics, forcing the players to fight each others.



- 1/4 Achiever

We haven't designed our game in order to be appealing to this type of audience, since the typical achiever wants the opportunity to show off their skill and hold elite status to others, and, with this mechanic, might despise a Socializer that want build a friendly connection to him/her.



- 0/4 Explorer

As for the Achievers audience type, and since the linearity of our game world, our game will not be appetizing to this type of audience.



3.2 Target Audience - Demographic taxonomy

3.2.1 Gender

Since the core of our game is a Action / Beat'em up , we can expect to attract mainly male players, who are the majority of the player for this genre.

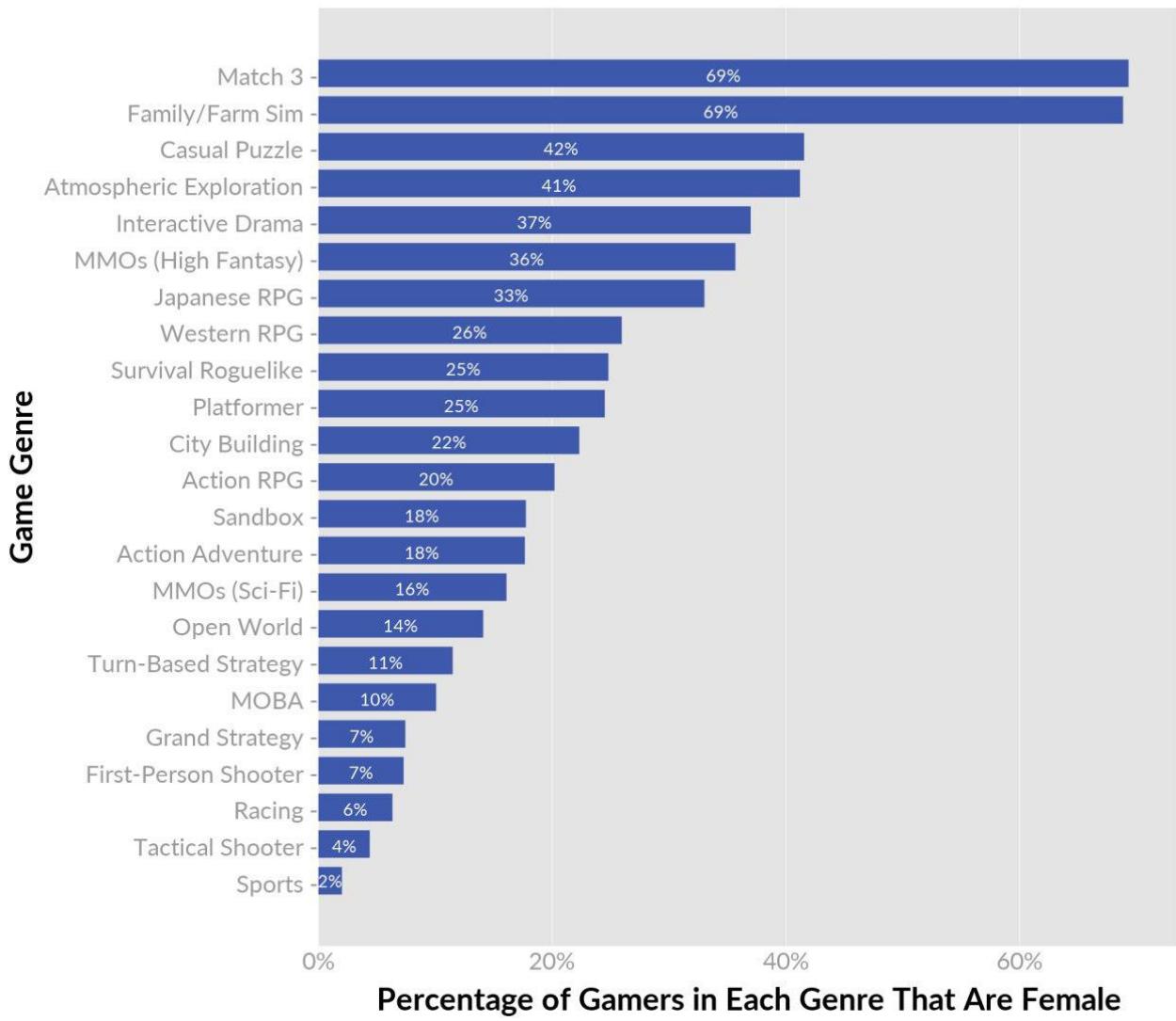


Figura 1According to www.statista.com

3.2.2 Age

We restricted the core of our target audience to the players who are teenagers (13-17) and young adults (18-24).

- Teenagers, who are starting to develop their personal taste, can find our visual choice much more intriguing. Analysing the context where our gameplay takes place, we do believe that this game can be a powerful way to socialize and play

together in school. Given the little time required for a match, it's perfect to make new friends and play together during the breaks from the lessons.

- Young adults and people beyond that age, whose taste has become well defined, can choose our game as a good way to satisfy their will of hardcore gaming. As a strong point for the aforementioned age ranges, our match length and chosen

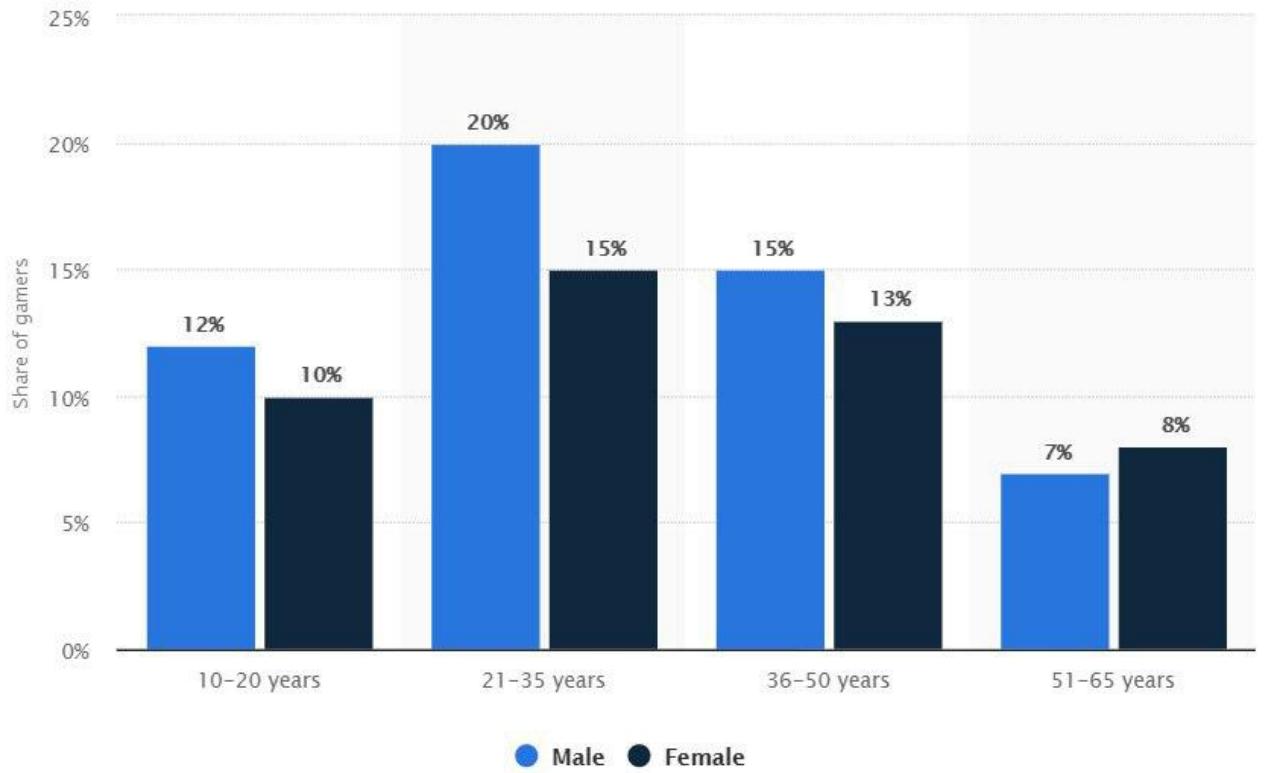


Figura 2 From www.statista.com

platform makes our game perfect for commuters. While this situation applies to teenagers too, these two age ranges can spend more money and we expect that they will provide a higher revenue.

Players behind the teen age could be interested in our game too since it does not require complex reasoning, but it is also known that kids tend to attach to a single genre during those years and change game quite often, jeopardizing our hardcore mechanics. Nevertheless, given our cartoon aesthetic choices, there is a possibility that they will be attracted by our game.

Moreover, from the previously gathered data for the age-audience analysis, we want to be appealing to the female players-base. In order to do that, we have implemented female virus style and some ad hoc event in the viruses' guilds promoting female players (e.g.: every Wednesday there will be the "Virus Fatale" that will provide a 10% experience bonus to all the female players).

3.2.3 Personas



Name: Andrea

Occupation: High school student

Age: 16

Goal: Andrea wants an easy mobile game to play with his friends during school and lazy afternoon.
digital experience

Criteria for selecting games.

- Easy to download and play
- Ability to compete against friends
- Strategic thinking needed but not a time sink

Frustrations with games

- Too hard to advance
- Friends become unresponsive

Backstory: Andrea has a quite introvert personality and he has some troubles to find new friends. He is a classic nerd and spends plenty of time and parent's money on video games. You could safely say they are one of his main hobbies and perhaps the focal point of his life, and he would totally agree. He has dozens of games downloaded on his computer and mobile devices, and he is always playing one or the other. He is a student but naturally aspires to work in the tech industry and perhaps game development himself. He has probably already sketched out the plot and begun to design and perhaps program his first titles. He might already know how to code as well. Andrea is not just a gamer, he's interested in the industry as a whole.



Name: Camilla

Occupation: Undergraduate

Age: 23

Goal: Camilla wants something easy to play with captivating and inspiring visual art that make the game feel unique.

Expertise: Camilla has a adequate digital knowledge and she is really intrigued with mobile games

Criteria for selecting games.

- Intriguing visual sound
- Possibility of customization
- Friends' choice

Frustrations with games

- Too hard to advance
- Fully understand the mechanics
- Rare in game reward
- Friends become

Backstory: Camilla loves all things rainbow coloured and cute, so naturally she is a fan of a somewhat easy to play and intuitive game that fits in with her aesthetic. She works retail or at a beauty salon but wants to have her own boutique someday. She is a young 24 good-looking woman with a boyfriend but does not see forever with him – but that's okay! She plays during breaks at work and occasionally while she's binge watching something on Netflix too. She loves talking about her favourite games and actively participates in some communities centred on online and mobile gaming.

3.3 Platform

Since the limitations of Google Play Services encountered during the development, we have decided to release our game on mobile platforms running Android. The limitations consist of the deprecation of the multiplayer calls related on the Apple iOS environment. Nevertheless, as depicted in *fig 1*, the Android based smartphone vaunts about the 76% of the market.

This choice matches correctly with the target of users considered. The reasons of our choice are firstly based on the accessibility of the product: everyone has a smartphone nowadays and

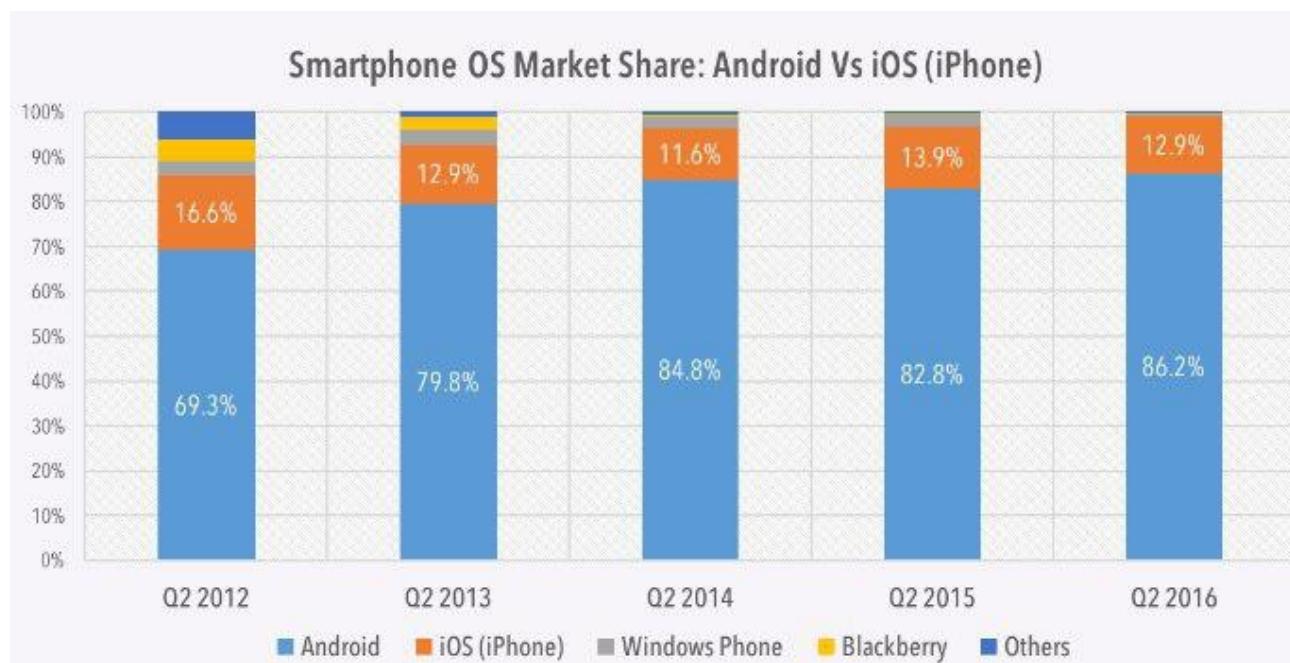


Figura 3 Smartphone market stats from www.TechPowerUp.com

can easily make use of a game; mobile games are also playable outside, without the limits of PC and console games, entertaining the player anywhere. The timer will influence the pace of the single match, limiting the duration of the gameplay: each level is designed to be played in few minutes in which the player faces other players online. We have also considered the necessity to make controls as simple as possible, using the gestures of the smartphone as input devices or to give tactile feedback, or limiting the information on the display and simplify the UI.

3.4 System Requirements

As described in the GTD Chapter CAPITOLO, we have estimated minimum hardware requirements of the smartphone/tablet with:

- CPU: Any quad-core processor with Armv7 instructions set or better (e.g. SnapDragon 400 series, MediaTek MT6580+, etc.)
- Network technology: compatible at least 3G connection
- RAM: At least 1.5Gb
- MS: At least 100Mb of free space

3.5 Top performers

In the Beat'em Up market, according to trusted web resources like SteamCharts and Steam Spy, the top selling games are:

3.5.1 Tekken Saga



Tekken Saga

Developer: BANDAI NAMCO

First release Tekken JP: December 9, 1994

Last release Tekken 7 WW: June 2, 2017

Genre: Fighting

Platform: PlayStation, XBOX, Nintendo, iOS, Android

Tekken Saga is a fighting game with 2D/3D graphics. It is playable in both one and two player (PvP) .The camera is stationary, and the controls are relative to the character. Tekken was one of the first fighting game at the time to use 3D animations. There are seven main instalments to the series and the latter has been adapted into three films and others media. Tekken counts 44.000.000 units sold.

3.5.2 Brawlhalla



Brawlhalla

Developer: BLUE MAMMOTH GAMES

Release WW: October 17, 2017

Genre: Fighting

Platform: Windows, MacOS and PlayStation4

Brawlhalla is a fighting game with 2D graphics. It's playable from 1 to 4 players in single player or multiplayer mode. The camera follows the player and the controls are relative to the character. In all of Brawlhalla's gamemodes, the goal is to knock one's opponent off the stage comparable to Smash Bros. The last player standing or the player with the most points wins the match. Brawlhalla counts about 50.000.000 downloads (about 10.000.000 on Steam).

Followers: 100,742

Peak concurrent players yesterday: 9,146

Peak on Twitch yesterday: 500 viewers, 49 channels

YouTube stats: 154,712 views and 2,206 comments for videos uploaded last week, over 50 new videos uploaded yesterday

Playtime in the last 2 weeks: 07:39 (average) 01:23 (median)

Playtime total: 17:45 (average) 02:10 (median)

Based on SteamSpy

3.5.3 Closer



Closer

Developer: NADDIC GAMES NK STUDIO

Release KOR: December 30, 2014

Genre: Action

Platform: Windows

Closer is an action game with 3D graphics. It is a solo/multiplayer game. The camera rotates with the player and the controls are relative to the character. This is a MORPG featuring hard hitting multi-hit combos. It is an episodic anime action RPG bursting with spectacular battles and steeped in an epic storyline. Choose your Closer, gather your friends or dive in solo, and use your amazing powers to protect Earth, in mankind's desperate battle against horrific monsters from another dimension!

Closer counts about 500.000 downloads on Steam

Followers: 24,318

Peak concurrent players yesterday: 882

YouTube stats: 41,204 views and 413 comments for videos uploaded last week, 28 new videos uploaded yesterday.

Playtime in the last 2 weeks: 08:54 (average) 01:32 (median)

Playtime total: 10:38 (average) 00:59 (median)

Based on SteamSpy stats

3.5.4 Lost Castle



Lost Castle

Developer: HUNTER STUDIO

Release: WW September 1, 2016

Game Mode: Singleplayer/Co-op

Genre: Action RPG/Beat'em up

Platform: Windows

Lost Castle is a RPG / Beat'em up game with a 2D graphics. It is playable from 1 to 4 players in single player or multiplayer mode. The camera follows the player and controls are absolute.

Lost castle is an enjoyable 2D side scrolling action RPG with a cute art style and with roguelike elements and randomized dungeons for up to four players.

Lost Castle counts about 1.000.000 downloads on Steam.

Followers: 86,934

Peak concurrent players yesterday: 846

Peak on Twitch yesterday: 18 viewers, 4 channels

YouTube stats: 1,620 views and 7 comments for videos uploaded last week, 1 new videos uploaded yesterday.

Playtime in the last 2 weeks: 02:37 (average) 03:27 (median)

Playtime total: 12:09 (average) 04:24 (median)

Based on SteamSpy stats

3.5.5 Castle Crashers



Castle Crashers

Developer: THE BEHEMOTH

Release NA: August 31, 2010

Genre: Beat'em up / Role-playing / Action

Platform: MacOS, Windows, XBOX and PlayStation3

Castle Crashers is a Beat'em up/action game with 2D graphics. It is playable from 1 to 4 players in single player or multiplayer mode. The camera follows the player and controls are absolute.

Castle Crashers is a side scrolling game that incorporate a small number if role-playing video game elements. Hack, slash, and smash your way to victory in this award winning 2D arcade adventure from The Behemoth!

Castle Crashers counts about 5.000.000 download on Steam

Followers: 95,521

Peak concurrent players yesterday: 357

Peak on Twitch yesterday: 20 viewers, 4 channels

YouTube stats: 3,218 views and 130 comments for videos uploaded last week, 7 new videos uploaded yesterday.

Playtime in the last 2 weeks: 01:12 (average) 00:45 (median)

Playtime total: 10:28 (average) 05:08 (median)

Based on SteamSpy stats

3.6 Feature comparison

TITLE	Virulent Addiction	Tekken Saga	Closers	Lost Castle	Castle Crashers	Brawlhalla
GENRE	Fighting / Beat'em up	Fighting	Action	RPG beat 'em up	Beat 'em up, role-playing, action	Fighting
GRAPHICS	2D	2D/3D	3D	2D	2D	2D
PLATFORM	Mobile (Android)	Microsoft Windows, PlayStation, Xbox, Nintendo	Microsoft Windows	Microsoft Windows	Xbox 360, PlayStation 3, Microsoft Windows, OS X, Xbox One	Microsoft Windows, macOS, PlayStation 4
NUMBER OF PLAYERS	1 – 4	1 – 2	1	1 – 4	1 – 4	1 – 4
GAME MODE	Single-player / multi-player / cooperative	Single-player / multi-player	Multi-player	Single-player / multi-player	Single-player / multi-player	Single-player / multi-player
CAMERA	Follows the player	Stationary	Rotates with the player	Follows the player	Follows the player	Follows the player
CONTROLS	Absolute	Relative to the character	Relative to the character	Absolute	Absolute	Relative to the character

Our game is different from the other ones because the classic beat'em up games embraced only the fighting mechanics excluding the social component, or limit it to a PvP experience (Tekken Saga, Mortal Kombat, etc.). In the other hand, we aren't creating only a fascinating and coloured social game, but we have wrapped around the beat'em up mechanics several cooperative elements (like the first part of the game, the guilds, the emoji-chat, etc.). Moreover, our gameplay isn't limited by a static beat'em up mechanics, in fact we can highly customize our characters attaching to it some new appendages, discovering new weapons and power ups and unlocking new, endearing scenario, evolving continuously the user experience. Furthermore, anyone can play with the minimum possible amount of taps: open the app, tap on play casual and you're playing right away with people all over the world. The market offers many mobile games that are online or real-time, but very few of them offer both features at the same time. One of the reasons is technical: lag is incredibly difficult to handle, especially on mobile network. Reducing lag as much as possible is one of the most challenging tasks that our team is facing and we are confident to bring positive results applying the Google Play Services techniques.

4. LEGAL ANALYSIS

The "Virulent Addiction" name is free from copyright. The resources and assets used in the game are produced by our team of developers and/or are available with a free license.

About legal analyses and disclaimers, there shouldn't be any problems concerning the geographic location, since the most destructive plagues took place centuries ago, thus there aren't recent references that can affect sensitive players.

Furthermore, we have forecast a PEGI (Pan European Game Information) rate of 7: Virulent Addiction is not definitely a violent game, but it has some contents related to the Doctor V like occasional foul language and the cruelty towards the creature generated by the Creature'O'Matic (even though it is a fictional creature), that makes the PEGI 3 rate impossible to obtain.

5. GAMEPLAY

5.1 Overview

Our gameplay is composed by:

- A cooperative PvE part in the first and middle section of the level which forces the players to help each other in order to pass specific gatekeepers, defeat complex enemies and to combine their skills to unlock special rewards. Furthermore, we have decided to implement the possibility to reanimate the other players within a limited time.
- A PvP part, in the final section of the level, will occur. This is composed by a very intricate gameplay, since the friendly fire is deactivated and the players are forced to think of who they want to defeat. In fact, every body organs has its Princess, acting like a final boss, thus the players have to decide which creature has the highest priority, killing first the other teammates or focusing on the Princess. Once the Princess and the other players are defeated the one who survive is the winner.

5.2 Gameplay description

5.2.1 Sign in and initial phase

First of all, in order to play the game, the player has to own an internet connection.

When the player opens the game, for the first time, on a mobile platform you have to log into your Google Play Games account in order to benefit from its services. Then the player has to choose his/her virus genre (see *Figure 1*): in specific areas of the

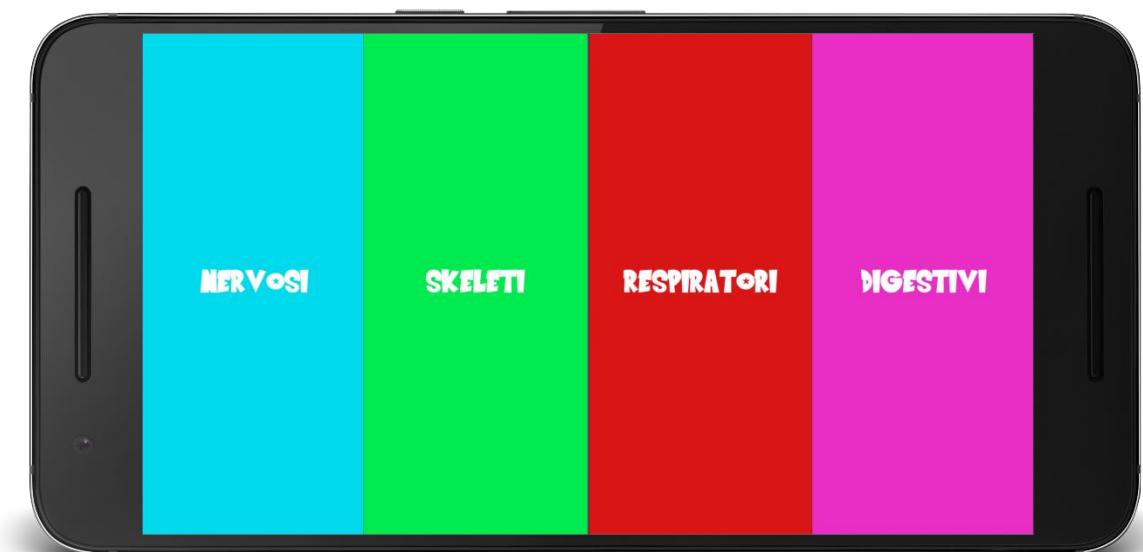


Figure 1: Guild selection

creature's body, there is a sort of guild that includes all the viruses of that specific type, creating a base of friends / allies where the players can develop new mortal features for their body, special abilities and develop new weapons and items. Once the player has selected the faction, he/she cannot modify it.

5.2.2 Main menu

Once the player has logged into Google Play Services, he/she can choose between two game modes (see *Figure 2*):

- **Single player mode:** is a sort of test-abilities area in which the player plays a scenario that has a reduced amount of enemies and obstacles. There are not gatekeepers and, in the final stage, the princess is considerably less powerful, allowing the player to complete the scenario without the help provided by other players. This mode is focused about training the player to achieve better in-game performance: test his weapons, the skill that have just unlocked, a series of combo and so on. This game mode has to be played at least ones, since there will be a popup-based tutorial that it will explain the gameplay mechanics.
- **Multiplayer mode (2-4):** players can decide to create a new match or search an existing one. Once the game starts, no one can enter in your lobby until the end of the match. This is the most substantial part of the game since the fully gameplay mechanics are available. This game mode is unavailable until the player has played at least once the single player mode, learning the gameplay core mechanics by the popup-based tutorial.



Figure 2 All-One mode

5.2.3 Gameplay

(Since the multiplayer mode is the one that allows fully gameplay mechanics, in this paragraph we describe only this part. The single player mode, besides the presence of other players and enemies stats balancing, has the same gameplay core mechanics)

Once the game starts, the player is spawned (see *Figure 3*) into the creature generated by the Doctor V's Creature'OMatic.



Figure 3 Example of Gameplay

Since the creature has to simulate human's organs, the game's environment displayed on screen will be an artery, intestine, brain's dendron and bone's marrow. Obviously the environment will be filled up with many obstacles and gatekeepers slowing and make the pacing harder and forcing the player to cooperate with each other.

Each player's virus has a marker identifier above its body coloured basing the respective player entry position in the lobby (see Fig 5).

In an environment, the player can move through an invisible dynamic touchpad that it is placed in a restricted portion of the device's screen located on the bottom left corner, which allows to the player's movements in any direction. Instead of beat'em up classics, there is no jump actions since the viruses are injected into the creature's body, thus the player flutters like in a fluid. So we have implemented a dash button that is influenced

by the player speed or virus special ability and it can push him/her towards several meters (for more details, see below [Chap 5.4.1](#)).

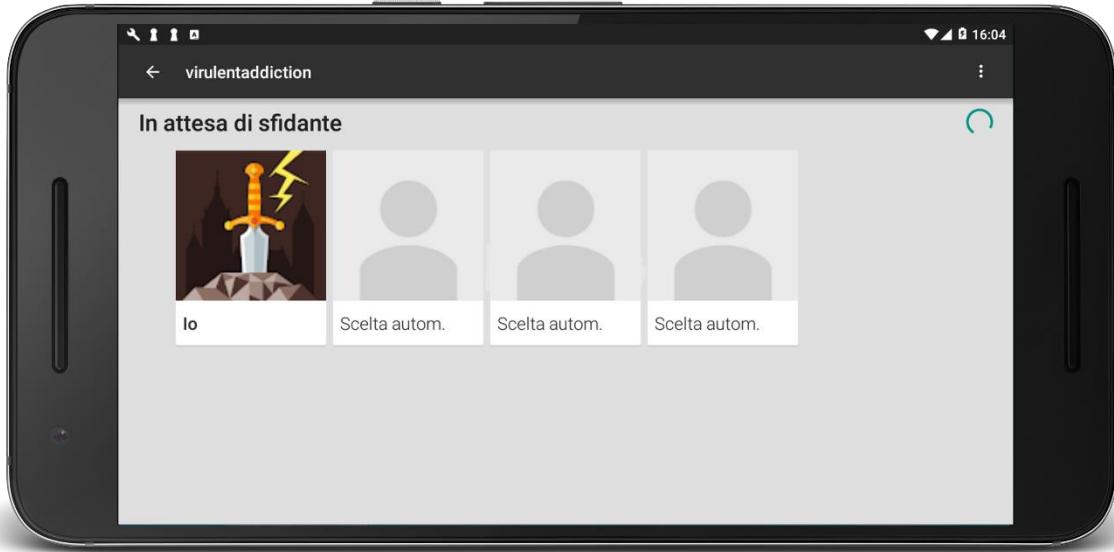


Figure 4 Google Play lobby

Moreover, tens of red globules will spawn in every section of the game, but the last. These are fundamental to keep the player alive, since each virus has its own half-life: incorporating red globules will raise your HPs, which are drained from the beginning of the level.

Furthermore, the creature's immune system will release specific defences. In our game, these are the enemies to defeat, in fact, they try to stop the players with white globules, antibiotics, pills, vaccines and, in the end, The Princess related to the specific organ environment. Each enemy is characterized by its movements and type of attack (for more details, see [Chap 6.2.2](#)).

In the other hand, each player can performs:

- Melee weapon attack: there will be four types of combos accordingly to the tap-sequence performed by the player
- Long-range weapon attack: this attack has a recharging time accordingly the player stats. The projectile fired by the weapon, hits every enemies throughout its trajectory.

- Special ability: has for the long-range weapon attack, the usage of the special ability is limited by a recharging time. This attack characterizes the type of virus chosen from the beginning of the game.
- Dash: this is not an offensive attack but allows the player to perform a thrust, avoiding enemies attacks, or the forth melee combo.

(for more details, see [Chap 6.2.1](#)).

The length of the environment depends on its type. For example, an intestine scenario will be longer than a brain scenario but the brain ones will be more concentrated in terms of enemies and obstacles.

(for more details, see [Chap 9](#))

5.2.4 Final phase

At the end of the level, there is a cliff-hanger: the friendly fire is activated, so a player can kill another one, the HP drain effect is disable and The Princess will spawn. The Princess acts like a final boss and every organ has its own with her special set of attacks. In this way, the gameplay is tricky: the player has to decide very quickly which his current target is, tearing apart the cooperative component introducing a real death-match. The finale mechanics make The Princess undefeatable by only one player so is up to the player's choice defeat firstly his most dangerous teammate or cooperate with some or all of them in order to weak The Princess.

5.2.5 Scoring / winning and defeating conditions

In the Single player mode, the winning condition is defeat the Princess, lowering her life points to 0.

In the Multiplayer mode, the winner is the player who survive after the fight against the other players and The Princess.

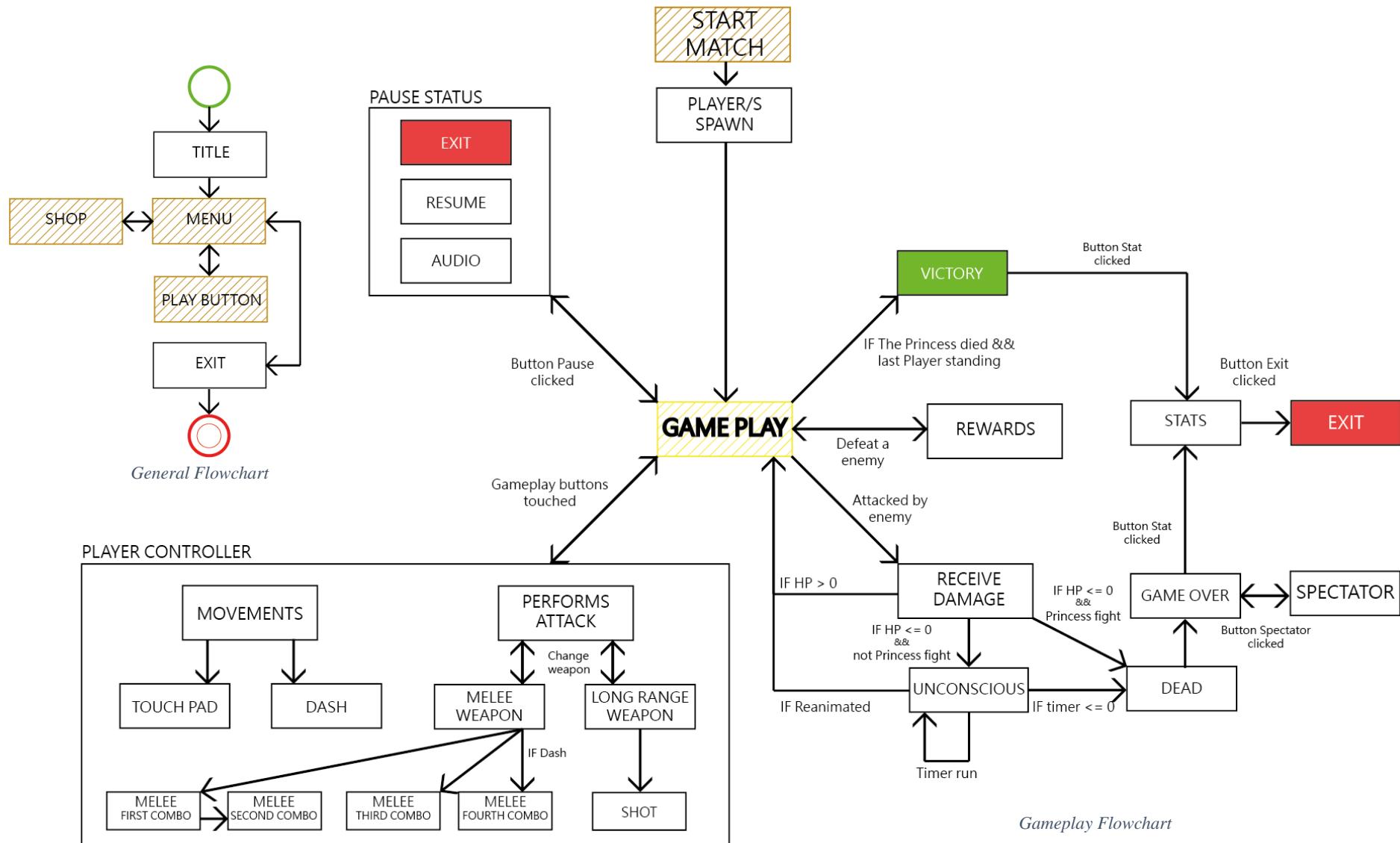
The player scores every time he/she defeats an enemy. The corresponding XP and coins amount is balanced by the enemy's threat level.

Moreover, in the last view after The Princess is defeated, the scoreboard shows the total amount of XP and coins gained by the player. This amount is influenced by:

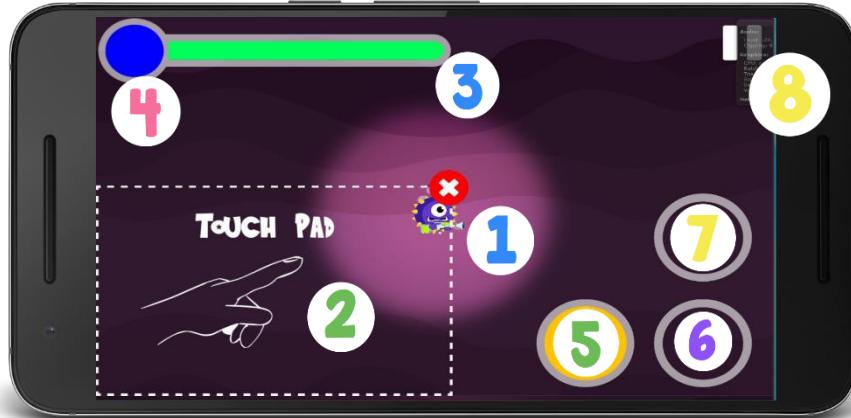
- red globs incorporated (1 XP and 1 coin each)
- combo kills done (2 XP and 1 coin each)
- assists done (5 XP and 3 coins each)
- successful strikes (5 XP and 5 coins every 15 strikes)
- meters travelled avoiding any attacks (5 XP and 5 coins every 30 meters)
- team mate reanimated (10 XP and 10 coins each)

Each player, at the end of the level, will see a view listing the other players that have just played in which everyone has to assign a positive or a negative vote to each other and the mean of votes assigned to a that specific player will attributes to him a positive or a negative reward. Ending this final phase will lead him to the multiplayer mode view.

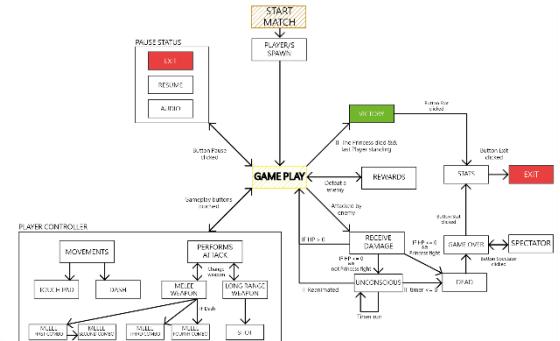
5.3 Gameplay and general Flowchart



5.4 Controls and Flowcharts



In game screenshot



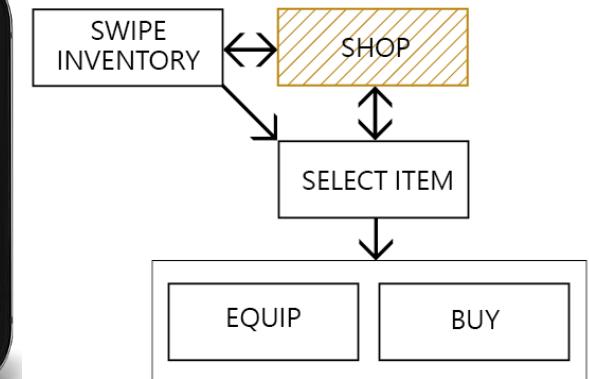
See Chap 5.3 for a bigger image

- 1) **VIRUS:** The playable character is always camera-centered.
- 2) **TOUCH PAD:** In the left-bottom corner of the device's screen, there is a zone dedicated to the PC's movements. The player has to simulate an analog stick, pointing the finger on this zone and, holding down, drag the up/down/left/right direction.
- 3) **HEALTH BAR:** This bar represent the virus' health. Every time the virus is hit, a quantity accordingly to the received damage, will be consumed. When this bar is depleted and the player has chosen the singleplayer mode, the virus is dead and the play is over. If the player has chosen the multiplayer mode, the virus can be reanimated by the others.
- 4) **COLOR MARK:** This circle is colored by the color assigned to the player during the lobby creation.
- 5) **LONG RANGE WEAPON ATTACK:** Tap this button will fire the long range weapon equipped at the moment. Every long range weapon in the game has a recharge rate of 2 seconds, preventing a constant fire by the player. The button will be fully colored when the charging time is depleted.
- 6) **DASH:** Tap this button will allow the player to dash straight to the current direction.
- 7) **MELEE ATTACK:** Tap this button will perform a melee attack by the player. Combos are achieved in three ways:
 1. 1 TAP: Basic attack
 2. 2 CONSECUTIVE TAP: Lunge attack
 3. HOLD TAP: Swirl attack
 4. DASH BUTTON + MELEE ATTACK: The virus will throw its melee weapon like a boomerang
- 8) **PAUSE:** Tap this button will pause the game.

5.4.1 Interfaces



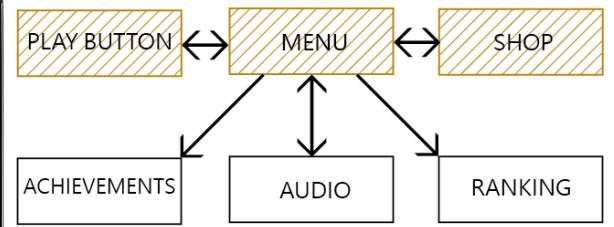
Market screenshot



Market flowchart



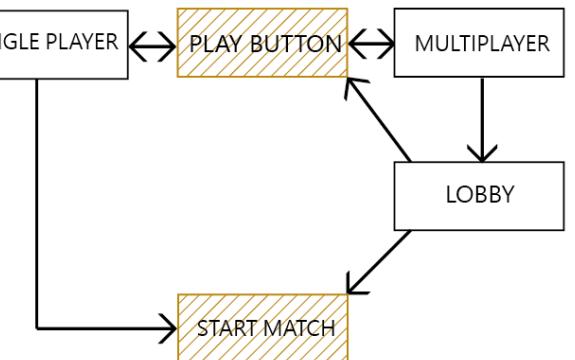
Main menu screenshot



Main menu flowchart



Figure 5 All-One mode



Play menu flowchart

5.4.2 Rules

In terms of attack, the players are limited by these rules: you cannot hit your friends until the final stage (no friendly fire) and the special attack has a recharging time.

The players' health point start to decrease from the beginning. In order to restore the player's HP the player has to incorporate red globules attacking them when they are closed to the player.

Players' movements are limited by the effect that the player can back away only for few meters and there is not a time limit to reach the end of the scenario. Moreover, there is not the collision between each player and enemies to enhance the player's movements. Once the player has chosen his guild, he cannot change it.

5.5 Modes and other features

As described in the previous chapter (see [Chap 5.2.2](#)), Virulent Addiction provides two game modes: single player and multi-player.

5.6 Levels

We have implemented the levels considering one random level for each organ: at loading time, the game generates through PCG (Procedural Contents Generation)s the level that has to be played combining randomly several blocks (background and ground) in order to provide a different experience every time the players joins or creates a match. The structure of a level, generally remembers a tube in which the player can flutter. The surfaces are not plane making the environment more believable and the size of it allows the player large movements (about 10 times the viruses size). The camera moves horizontally throughout the level following the player.

6. GAME CHARACTERS

6.1 Characters design

Virulent Addiction allows to the player the choice between four kinds of viruses, selecting one of them at the first time the player starts the game.



To make our game balanced all viruses have the same characteristics and attributes:

- Movement speed
- Attack speed
- Recharging time
- Attack damage

The feature that characterizes each virus is its special ability (for more details, see [Chapter 6.2.1](#)) Since the cartoon style of Virulent Addiction, we have designed each virus characterizing them with a humoristic view (e.g. the *Respiratorium* virus is featured with a snot pending from its nose, the *Skeletivirus* is designed with skeleton style).

Moreover, during the multiplayer section, each player's virus has a marker identifier above its body coloured basing the respective player entry position in the lobby, distinguished each virus from the others.

Regarding the enemies, we have kept the same humoristic view characterizing them basing on the type of cure provided (e.g. the vaccine is represented by a syringe; rather than the pills where, due to the occasional difficult to swallow them, are depicted as a common pill surrounded by spikes).

6.2 Types

6.2.1 PCs

(1) Human respiratory syncytial virus (**HRSV**):



An example of Respiratorium's virus

is a syncytial virus that causes respiratory tract infections. It is a major cause of lower respiratory tract infections and hospital visits during infancy and childhood.

(2) Koch mycobacterium:



An example of a Skeleti's virus

is a species of pathogenic bacteria in the family Mycobacteriaceae and the causative agent of tuberculosis. First discovered in 1882 by Robert Koch.

(3) Rotavirus:



An example of a Digestive's virus

is the most common cause of diarrhoeal disease among infants and young children. It is a genus of double-stranded RNA viruses in the family Reoviridae.

Zika Virus (ZIKV):



An example of a Nervous' virus

is a member of the virus family Flaviviridae. It is spread by daytime active Aedes mosquitoes. Its name comes from the Ziika Forest of Uganda, where the virus was first isolate.

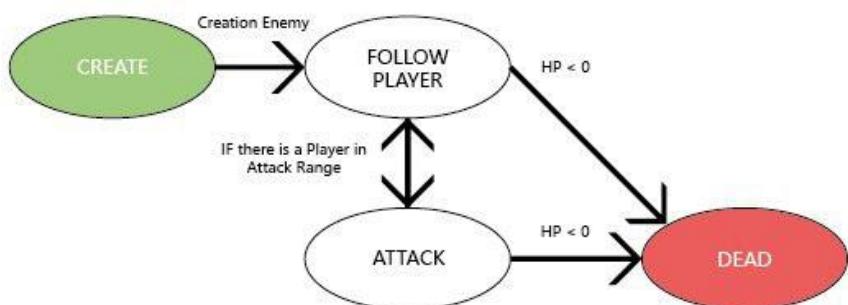
FEATURES		MELEE WEAPON		LONG RANGE WEAPON	
HP	30	1° ATTACK DAMAGE	15	DAMAGE	45
VELOCITY	8	2° ATTACK DAMAGE	30	CHARGING TIME	2 s
MASS	1	3° ATTACK DAMAGE	45	BULLET SPEED	1200
DASH FORCE	10000	4° ATTACK DAMAGE	45		
DASH TIME	0.5 s				

SPECIAL ABILITY			DAMAGE
<i>Respiratorium</i>	Cough	A cough that starts from the virus and goes in straight direction exploding when it encounters an opponent. The explosion will performed an area damage.	50 damage to every player in area
<i>Skeleti</i>	Adamantium skeleton	Once a Skeleti virus perform this special ability, its body become extremely resilient, damaging each opponent during the pace.	Cannot lose life and 50 damage point to every player you touch
<i>Digestive</i>	Fart	A fart starts from the virus providing a more powerful dash than the standard one making the virus like a ram, damaging every opponents encontured during the animation	3x faster dash then normal and 50 point damage to every player you touch
<i>Nervous</i>	Electric discharge	An electric discharge that starts from the virus expanding in a circle like shape, damaging every opponent that meets.	50 damage points to every player in area

6.2.2 NPCs

The enemies you can meet are several:

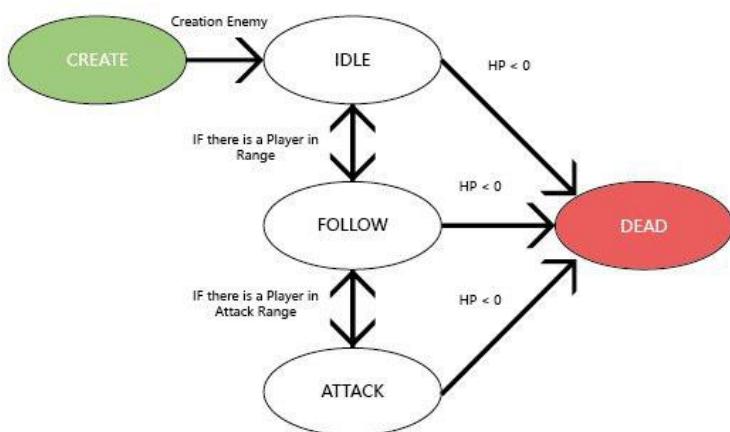
White globules:



They are the weakest type of enemies that a player can encounter. They are represented by stylized cop that flutters like the player through the level. Their attack consists in a melee bite.

HP	30
VELOCITY	8
MASS	1
TIME TO ATTACK (if in range)	0.3 s
DAMAGE	2.5

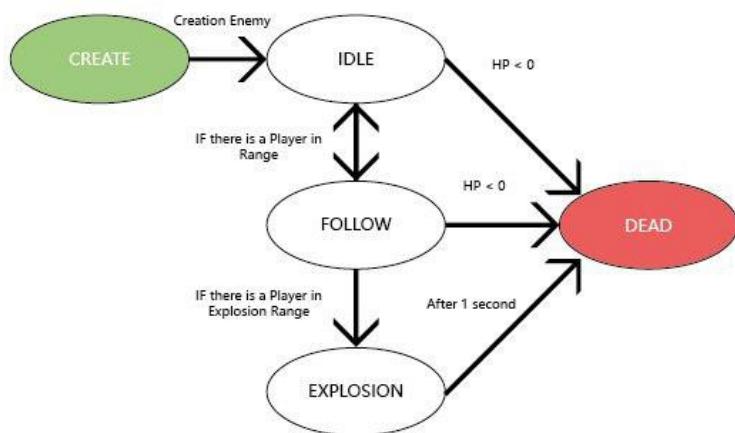
Antibiotics:



They are represented by a small bottle of pills, wearing a military helmet. Its mass doesn't allow to flutter quickly throw the environment. On its body there is a small window that, when it is opened, releases a surgery saw that it can lunge towards the player.

HP	30
VELOCITY	5
MASS	3
TIME TO ATTACK (if in range)	1 s
DAMAGE	10

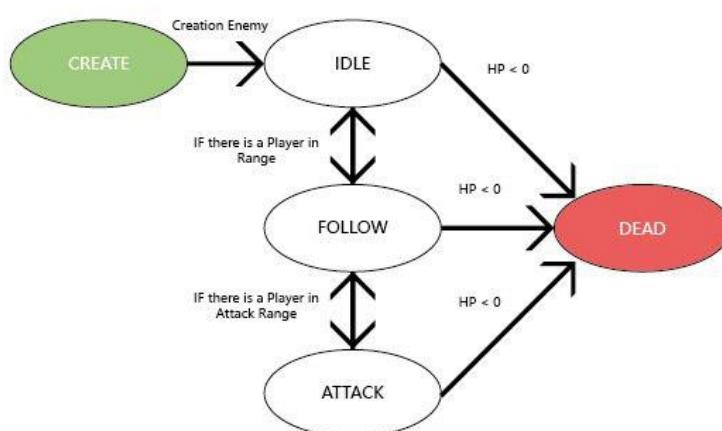
Pills:



They are at the same level of the antibiotics in terms of threat. A pill ridiculous mass provides an extreme speed to it, allowing a very fast slicing attack, bouncing throughout the scenario. They have a sort of special attack that makes them acting like a crazy splinter that can destroy some scenario's element creating traps.

HP	15
VELOCITY	7
MASS	2
TIME TO ATTACK (if in range)	0.5 s
DAMAGE	15

Vaccine:



They are represented by a stylized syringe. They have some of the peculiar stats of the previous enemies like a very high attack speed, noticeable strength combined with a long-range attack: a ray-cast starts from its central sting, searching for an opponent. Once the ray-cast encounters an opponent, the vaccine will lash towards its target.

HP	45
VELOCITY	10
MASS	3
TIME TO ATTACK (if in range)	1 s
DAMAGE	30

Final bosses (**The Princess**):

There is not only one Princess but, since there are several organs that can be infected, each of them has its own, thus they are different regarding its type of "realm".

(For further details see [Chap 8.2](#))

- **Digestive Princess:** She is represented by wearing a cloak of green acid goo. When she waves it, a toxic cloud is lunged towards the player's virus corroding them for a limited period of time.

- **Respiratorium Princess:**

She is represented by curl of air expanding it like a real lung, producing small tornados that slide throughout the scene



- **Skeleti Princess:** She is

represented by a skeleton body that she can use extracting a bone from it and throws like a boomerang that will damage every opponents throughout its trajectory.

- **Nervous Princess:**

She is represented by an intricate tangle of synapsis wrapping its body and subsequently its attacks are electric based



7. OTHERS GAMEPLAY ELEMENTS

7.1 Resources

(1) HP:



Be careful, when you have low HPs recharge those killing red globules

(2) EXP:



Use your EXP gained to unlock new contents and to taunt your friends

(3) Money:



Use money gained to buy new items, skins and weapon from the market.

(4) Weapon:



Use new special weapons found in game to help your friends to survive.

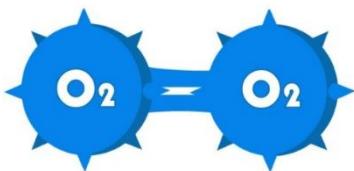
(5) Bullets



Bullets are a resource. Find them in game to shot with your long-range weapon

7.2 Roadblock

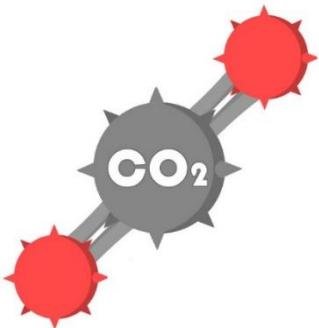
(1) Oxygen



The most common entities that you can encounter in your blood are two small Oxygen particles

DAMAGE	20
--------	----

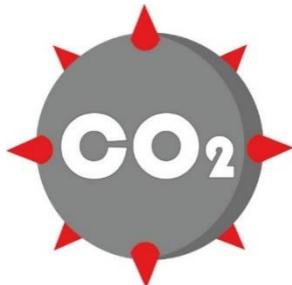
(2) Carbon dioxide



A normal three-particle system you can find in your blood easily named CO_2 .

DAMAGE	20
--------	----

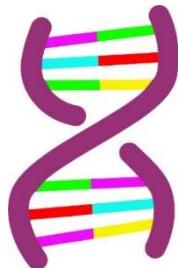
(3) Spike ball



A heavy CO_2 particle that smash the players

DAMAGE	50
--------	----

(4) DNA strand



A colourful DNA strand that slows the players' pace.

DAMAGE	-
--------	---

7.3 Gatekeeper

(1) Valve



In the level, players can find a valve to open cooperating with your teammates. Each player has to enter in a bubble of his colour at the same time of others.

8. STORY

8.1 Synopsis

Year 2077, Azimuth X planet. This belligerent world has one terrible mantra: exterminate another world's every week population in order to demonstrate its immense power. The High Commanders of the Ministry of the Worlds Destruction this week decide to exterminate the Earth's population, but, due to the funding cuts to the Massive Destruction Weapons, they order to the Chemical Alien Inc. Corporation, more specifically, to the highly advanced Virus Research Laboratory, to develop the most destructive virus mixture ever made. Doctor V, chief with no scruples of this section of the corporation, has all the necessary equipment in order to create a whole new terrifying plague, including his Creature'O'Matic, a special device that generates an alien creature ready to be infected with virus' samples and tests their effects on it.

8.2 Backstory

Doctor V has a very troubled past. His strongly shy nature and passion for terrible and deadly viruses led him to be almost a social outcast.

A series of very sad events have slowly, but inexorably, destroyed his benevolent intentions: jeered by everyone, excluded from every events and stressed by the parents' expectations, were a daily occurrences. Doctor V had no claims, he simply aspired to find a true friend or a person to pour all the love accumulated over the years.

The climax was when Helen, the girl he was madly in love with, refused her invitation to the prom very rudely. Doctor V returned home, crying, promising himself to destroy everything or anyone that could cause him even the slightest pain. What could completely fulfill his desire? His numerous viruses, or as Doctor V says, "his adorable pets". He left home and began to

specialize assiduously in bacteriological weapons at the Alien Chemical Inc., quickly climbing all the floors of the Virus Research Lab and becoming Chief Researcher.

His laboratory, in which no one is allowed to enter, is the demonstration of his evil will: poster of foreign populations with listed all their respective weaknesses, photos of the terrible effects of his infections and action figures representative of his beloved viruses. A strange and futuristic device placed in the middle of the room, called Creature'O'Matic, is one of his most advanced inventions, allowing a continuous production of fresh specimens ready to be infected with virus samples and test their effects on it. The episode related to Helen continues to haunt him every day and night. All his hatred was poured into the implementation of the Creature'O'Matic, specifying that the main defense of every newborn creature has to have the appearance of his beloved / hated Helen.

8.3 Narrative devices

The story is revealed by few cut scenes that introduces the player to the Virulent Addiction mood explaining the game environment settings and the story behind it.

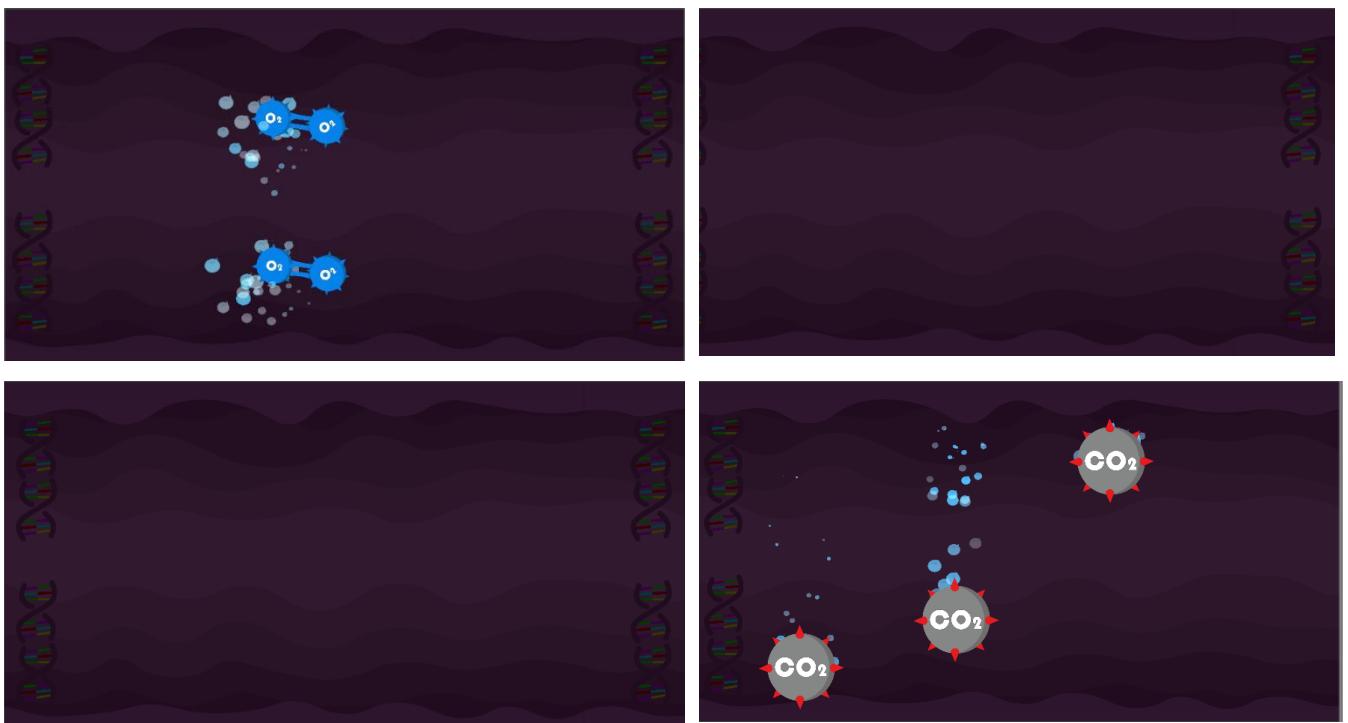
9. The Game World

The world created by our game is the creature's interiors like artery, intestine, brain's Dendron and bone's marrow, providing a different scenario every time (see above "Levels" 5.5). Every levels is composed by 2 gatekeepers that force the players to wait and cooperate with each other in order to pass it. Furthermore, once the path is filled with roadblocks and traps, like physical roughness, a blob of mucus that sticks every player in range, a cough performed by the creature that push back all, infected section of the environment that fall down and muscular spasms that constrain the environment layout. The surfaces aren't plane making the environment more believable and the scale of it allows the player large movements (about 10 times the viruses size).

To simulate the fluttering throw a fluid the mass of the viruses is 1 (unity scale) and the physic influence is set to 0.2.

To emphasize the visual experience, the environment is wrapped with gaudy colours texture making the scenario more appealing for example the veins scenario is colour with red shades and sparkling filaments, rather than the lungs scenario where are blue and light blue textures filled up with lighter bunches that mimic the alveolar sacs and bronchioles.

The audio sector is made up dynamic music that keeps pressing the player during the whole level, dynamic audio effects that can be muffed or raised up according to the environment scenario. For example, in a tight vein the sound of the fluid sliding overcome the others, rather than in a brain scenario some electric discharges referable to the synapsis, will occur.



10. Media List

ASSETS

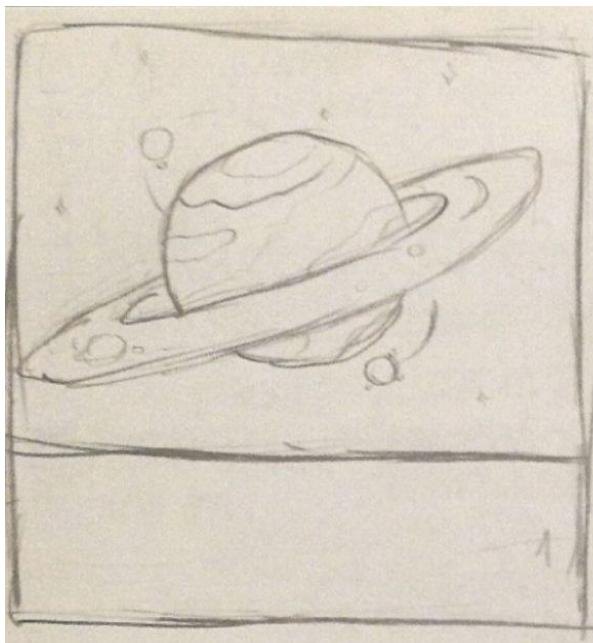
- Resources
 - o GamePlay
 - Effects
 - Explosions
 - Bullet
 - Overlay
 - Players
 - Local_Player
 - Guest_Player
 - Enemies
 - Antibiotic
 - Pill
 - Red_Globule
 - Vaccine
 - White_Globule
 - RoadBlocks
 - RoadBlock_1
 - RoadBlock_2
 - RoadBlock_3
 - Weapons
 - Long_Range
 - Melee
 - o Menu
 - Buttons
 - Labels
 - IMG
 - o Prefabs
 - All Prefabs
- Graphics
 - o HUD
 - Font
 - GamePlay
 - Icons

- Backgrounds
 - Layers
- Menu
 - Icons
 - Backgrounds
 - Layers
- Social
 - Banners
 - Logo
- Animations
 - HUD
 - Buttons
 - Panel_Menu
 - Panel>Loading
 - GamePlay
 - Players
 - Local_Player
 - Guest_Player
 - Enemies
 - Antibiotic
 - Pill
 - Red_Globule
 - Vaccine
 - White_Globule
 - RoadBlocks
 - RoadBlock_1
 - RoadBlock_2
 - RoadBlock_3
- Scripts
 - GamePlay
 - AI
 - Cache
 - Camera
 - Controllers
 - Effects
 - Enemies

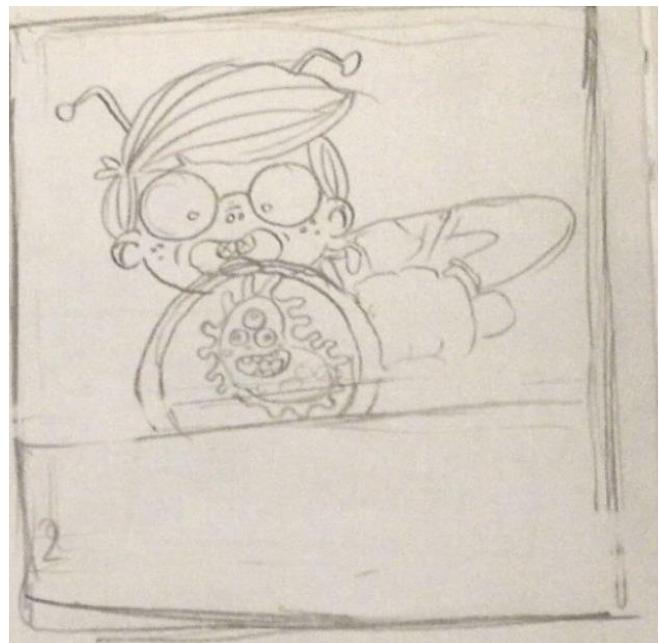
- Antibiotic
 - Behaviour
 - Controller
 - Pill
 - Red_Globule
 - Vaccine
 - White_Globule
 - Environments
 - Menu
 - Players
 - Local_Player
 - Guest_Player
 - RoadBlocks
 - Google_Play
 - Packages
 - Network
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 - Weapons_Manager
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- Google_Play_Games
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- OurUtils
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 - Android
 - IOS
 - Native
- Plugins
 - Android
- Plugins
 - Android
- Materials
- Physics Materials

11. Trailer Storyboard



Once upon a time, on the alien planet Azimuth X, a sweet little baby had a well-defined aspiration: become a world-renowned researcher of viruses.



Unfortunately, his strong passion for terrible and deadly viruses, led him to be almost a social outcast: jeered by everyone and excluded from every events.



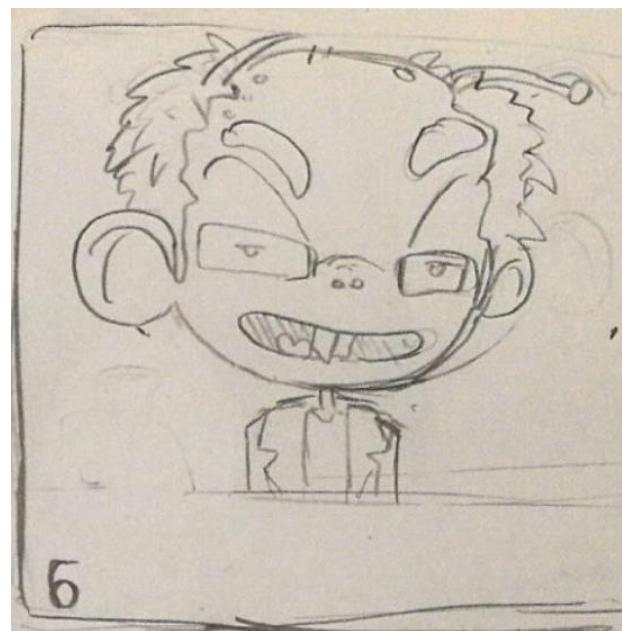
The climax of this malaise was when he asked Helen, the girl he had madly in love with, to accompany him to the prom, but she cruelly refused.



The boy returned home, crying, promising himself to destroy everything or anyone that could cause him even the slightest pain.



He left home and began to specialize assiduously in bacteriological weapons at the Alien Chemical Inc., becoming Chief Researcher under the pseudonym of Doctor V.



In the middle of his laboratory, there is a futuristic device called Creature'O'Matic, allowing a continuous production of fresh specimens ready to be infected.



Does the infection work? There's only one way to find it out: be the virus!

