                     Fall 2021 Principles of Software Engineering

                                             FAU CEN 4010

**The Vaccine Strikes Back**

Group 23

                                                 Milestone 1

                                                    9/28/21

                                              Revision History

**Executive Summary**

The impact that COVID-19 has brought upon the world is undeniably horrendous. There have been approximately 4.55 million deaths, and the death toll is still rising. Multiple vaccines have been put out, and as of September 1st, 2021 only 39.6% of the world's population has received a vaccination. Currently, 3 major vaccines are available: Pfizer, Moderna, and J&J.

We came up with our idea of our game “The Vaccine Strikes Back” not only to have a bit of fun in these tough times, but to try and help spread awareness of how the vaccine can potentially help stop the spread of the virus. Our game will be similar to how the game “Space Invaders” plays, but with a COVID-19 theme. Basically you will control a vaccine needle(i.e. the spaceship in “Space Invaders”) with the vaccine inside of it. This will be used as ammunition to destroy moving and falling harmful covid cells inside the body. If a harmful covid cell reaches the bottom of the screen or touches the vaccine needle, you will lose points. There will also be some cells that are too strong to destroy, which is where the in-game shop will come in. You will be able to buy power-ups and other items to aid the fight through the in-game shop. As you play the game, you will also be able to replenish ammo from vaccine droplets that will also fall from the top of the screen periodically. Our plan for the in-game shop is for the power-up items to be things that are known to be effective in fighting covid . There will be in-game descriptions for each item to help educate people about what they actually do. In conclusion, we came up with the design of “The Vaccine Strikes Back” to not only have a fun experience, but to also learn more about COVID-19 as well.

**Competitive Analysis**

There are a few different competitor games which have been released with similar gameplay to the one in which we are creating. One of these is Space Invaders, a top down arcade classic released in 1978 where you played as a spaceship defending from an alien attack. Another example is Galaga which was released a few years after Space Invaders in 1981 with added features such as being able to take over an enemy spaceship and play as them. Another game like these which introduced a new mechanic was Asteroids. In Asteroids, you controlled a spaceship which had free movement across the screen instead of a fixed position and shot asteroids out of the sky. The table below summarizes the features included in other games and the differences between those and the one we are creating:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Features | Space Invaders | Asteroids | Galaga | The Vaccine Strikes Back |
| Fixed Spaceship | X |  | X | X |
| Currency/Shop |  |  |  | X |
| Endless | X | X | X | X |
| Varying enemies | X |  | X | X |
| Powerups |  |  | X | X |
| UI/Menu |  |  |  | X |

**Space Invaders**: Space Invaders involves controlling a spaceship located at the bottom of the screen. The spaceship can only move horizontally and shoots vertically based on its position at the bottom. A key difference between “Space Invaders” and “The Vaccine Strikes Back” is the ability to access a shop and UI to buy power ups within the game.

**Asteroids:** Asteroids use a unique control mechanism to control the spaceship to blow up asteroids. Unlike our game, Asteroids allows control of the spaceship on any part of the screen, losing the restriction of staying at the bottom of the screen. This opens up the field that the player interacts with.

**Galaga:** Galaga offers many of the same features found in our game including a powerup and different types of enemies. In Galaga, if you destroy a boss ship you can gain the boss ship as an upgrade to be attached to your ship, doubling your damage against enemies. A key difference here is instead of dropping upgrades from enemies, enemies will drop ammunition for our ship to use. The shop will be the primary place to find upgrades for our ship.

**The Vaccine Strikes Back:** The Vaccine Strikes Back is meant to fulfill all of the features of the previous competitors and add even more to this classic game. It is also meant to be a fun and educational game which can provide a learning experience unlike the previous games. The item descriptions will allow people to learn about real life parts in the creation of the vaccine and the menu and shop added into the game allows more control and freedom over the functions of the ship. We choose to keep a fixed spaceship design to allow a finer area where we can control what happens in the player space. This allows for a higher quality game which requires more skill than luck and controls which are simple for anyone to learn.

**Data Definition**

**Overview, scenarios, and use cases**

**Use Cases**

**List of Non-Functional Requirements**

**High-Level System Architecture**

1. **mySQL Database** - mySQL is the database we will be using to handle the data in our project. Users will be adding to the database through actions on the website and we, the developers, will be managing the data on our side.
2. **Browser Compatibility** - Our game will be a web-based application that will work on all major browsers.
3. **Visual Studio Code(IDE)** - Visual Studio Code is a code editor that we will be using to create the code for our web game application. The following languages will be used in our project:

                    a.) **Javascript** - Javascript will be the language used for the backend of the game to make it very interactive and enjoyable for the user.

                    b.) **HTML(HyperText Mark-Up Language)** - HTML will be the language used for the frontend to ensure that the UI(User Interface) is visually appealing and enjoyable for the user. HTML will allow the browser to display the game.

1. **fau.edu Lamp Server** -The FAU lamp server is what we will be using to host our project.

1. **P5.Play** - P5.Play is a Javascript library for the creation of games. This is what we will be using for all of our animations, interactions, collision detections, etc.

1. **Google Firebase** - We will be using Firebase to handle user authentication for our project. We will not be able to see user passwords, and encryption is handled on Google’s end. This seemed like the best option for our type of project.

**Team Members and Roles**

**Checklist**