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# Flappy Vaders

## Game Design Document

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# 1. Overview

## 1.1 Game Description

Flappy Vaders is a retro styled endless scrolling casual game with a simple game mechanic.

Fly your spaceship as far as you can through enemy territory, avoiding obstacles and enemy fire, while collecting coins to purchase upgrades and powerups for your ship.

## 1.2 Target Platforms

Flappy Vaders is a game targeted for mobile devices and will be released on the Google Play Store initially.

It will target Android devices running Android 4.1 (Jelly bean) and upwards.

## 1.3 Target Audience

Flappy Vaders caters to people who are fans of casual and retro styled mobile games.

## 1.4 Monetisation

Flappy Vaders is a free to play game. It will show a full screen advert at the end of each turn. The player will be able to remove the adverts for a small fee. The player can also purchase in game currency to buy upgrades and powerups using real world money.

## 2. Game Styling

### 2.1. Graphics

Flappy Vaders will be very retro in its visual stylings. Graphics are based on a resolution of 144 x 108 pixels. This size is 1/10<sup>th</sup> the size of a standard HD screen, but in 4:3. This should give the game a retro pixelated look.

The graphics will be created using the 256-colour palette of the Sega Master System (pictured below)



To further add to the retro feel. The display will also have scanlines overlaid and a black curved outline at the edges to give the feel of viewing the game on an old CRT style TV.

The graphics will be cartoony, using a solid black outline.



The above image is a concept art rendition of a section of the game screen.

### 2.2 Sound and Music

The sound and music for Flappy Vaders should also be inspired by 80s gaming technology.

The aim is to have a game soundtrack which speeds up slightly the longer the player plays the game for.

# 3. Game Mechanics

## 3.1 Player Movement

The player character falls at a constant rate. Tapping the screen will give the player an upward velocity which decreases over time until they are falling again.

The player cannot tap the screen to propel the player character upwards again until the player character is falling.

Exact values for speeds, thrust etc. can be determined during development.

## 3.2 Parallax Background

The games background will be made up from several layers which scroll in parallax.

There will be a front layer, then any specific game scenery, then a couple of layers to represent depth (e.g. slight hills, then mountains in the distance)

As the game progresses, then the speed at which the player is flying through the level increases, which is reflected using the parallax background.

## 3.3 Zones

As the player flies through the level, they encounter different zones.

Each zone is around 4 to 6 screens long and has its own mix of coins to collect, and obstacles and enemies to avoid.

Each zone can have its own set of graphics as background, and obstacles for the player.

The list of zones below is suggestion only and further development/modification is expected to this list once the development has progressed further.

### 3.3.1 Pipes

Just obstacles, a throwback to the original Flappy Bird game.

### 3.3.2 Coins

A few obstacles and some coins to collect. Coins appear in set patterns which are randomly chosen from a list of pre-defined patterns.

### 3.3.3 Cannons

Obstacles and ground cannons which fire diagonally upwards toward the player.

### 3.3.4 Asteroids

Asteroids spawn off screen (-y) and descend at an angle of 225° (Downwards diagonally left) at the same horizontal speed of the level, with a constant downward speed.

### 3.3.5 Missiles

Missiles which fly from right to left, possibly using a laser targeting system to warn the player where the missiles will be flying (Like in Jet Pack Joyride, or Sky Force)

## 3.4 Scoring

The player earns points for each screen width\* which is successfully navigated.

The player also earns points for each coin which is collected. There is a separate value for the number of coins collected.

\* Screen width refers to the width the graphics are based on, not the device width, to make sure the game is not easier for people with narrower screens.

## 3.5 Player Death

The game ends when the player dies.

The player will die if the player character collides with any of the obstacles or enemy or gets shot down.

The player will also die if the ships y position gets too low on the screen.

## 3.6 Powerups/Upgrades

Power ups are split into two categories. Pickups, which are collected during the game, and Boosts, which are single use powerups which are purchased before the game.

### 3.6.1 Pickups

These power ups are activated by the player collecting an icon during game play. The icons float across the screen using a sin wave pattern. They require unlocking from the upgrade store before they will appear in game.

#### **Shield:**

The shield power up encloses the player in a protective bubble, preventing the player from crashing into other sprites. The top and bottom limits are enforced to stop the player passing through them, but the ship will not be destroyed while the shield is active. The duration of this powerup is affected by how many times it's been upgraded.

#### **Magnet:**

The magnet draws coins towards the players ship to make collecting coins easier. The higher the upgrade level, the larger the range of the magnet.

#### **Smart Bombs:**

The smart-bomb pickup will destroy all the enemy sprites (missiles, meteors etc.) but will not destroy buildings. The range and effectiveness of the bomb is determined by how upgraded it is.

#### **Score Multiplier:**

Increases the base score rate. Needs to be unlocked first with an initial purchase, and case be

upgraded a further 4 times to increase the value. Starts at 2x score, 4x score, 6x score, 8x score, and finally 10x score.

### 3.6.2 Boosts

Boosts are Single use abilities which are purchased before the game starts and are only active for the next game. They also need to be unlocked in the store and can be upgraded a further 4 times to increase their power.

#### **Head start:**

Whooshes the player at massively increased speed through the first couple of zones. Upgrade increases the distance travelled.

#### **Self-destruct**

The self-destruct causes the ship to detonate and progress a little extra distance. The size of power of the explosion is determined by the number of times it's been upgraded.

#### **Missile Jammer:**

Stops some of the missiles from attacking. Needs an initial purchase to unlock, and then can be upgraded a further 4 times. The number of missiles blocked increases with the upgrades.

Once fully upgraded it will block all missiles from appearing that game.

#### **Second Chance:**

Once purchased gives the player a chance to continue the game once they have crashed. It starts with a 1 in 5 chance of re-spawn and increases to 100% chance when fully upgraded.

## 3.7 Daily Bonus

To encourage player retention the game should include a daily prize system.

I decided to go with a scratch card style mini game, where the player is awarded one game card each day. I had found a code snippet in TGC forums (I think by Kevin Cross) which demonstrated the effect which I was looking for a solution to a different problem.

Prizes range from 50 coins to 950 coins depending on the randomly selected prize. 10 coins are awarded to the player if there are no matches.

The player can watch a rewarded video to earn an extra card, this should be limited to one card every 15 minutes.

Depending on how well the design side of things go, I would like to have the scratch cards have several different designs

## 3.8 Daily Missions

Again, to encourage the player to play more games, a system of daily missions should be used as well. Missions would be things like "Score 10,000 points", "Collect 10 coins", "avoid 15 missiles" etc. and specify one particular aspect of gameplay for the player to focus on.

The rewards for these should be coins or powerups. Once completed a mission should be removed from the list of daily missions.

There should be 3 to 5 daily missions. The missions will change every 24 hours, any remaining missions will be removed, and a new set will be created. There should also be a timer somewhere on screen showing the time till they reset.

The daily missions system should track how many times the mission has been completed, and once it has been completed enough times then the target value and the reward value should increase. There will be five levels of reward/difficulty for each mission.

### 3.9 Player Save Data

The players game progress (purchases, coins, inventory, trophy progress, etc.) will be stored in a data file on the local device.

The data in this file should be encrypted to prevent unauthorised modification.

This data needs to be loaded in at the beginning of the game and should be updated whenever relevant data is changed.



# 4. User Interface

## 4.1 UI Overview

The UI will be split over several distinct menu screens. It is important to plan these so that the player can get to each section with the minimum amount of button pressing.

Icons must be clear as to indicate their purpose and must follow the graphical styling of the rest of the game so as not to appear out of place.

Visual mock-ups of the User Interface layouts to be added later.

## 4.2 Main Menu

The main menu screen appears over a picture of the ship flying through space, with a parallax starfield behind it.

There needs to be buttons to allow the player to exit (Android only), Start a game, Enter the Store, and view the settings screen.

## 4.3 Game Screen

The game requires minimal UI elements. It needs to display the players current score, any currently active single use powerups or currently active pickups, which will be represented by their icon, and a pause button to allow the player to access the pause menu.

## 4.4 Pause Menu

The pause menu appears over the top of the game screen and offers options to resume or quit the game.

## 4.5 Game Over Screen

The game over screen displays a summary of the players performance over the game, as well as a button to return to the main menu.

## 4.6 Store Screen

The Store screen is where the player can purchase upgrades and powerups for their ship. It consists of a tabbed section which contains a list of scrolling items for purchase, a button to return to the menu, and a display of how much in game currency the player has available to spend.

The tabbed sections are for Upgrades, Power ups, In Game Currency, and Trophies.


## 4.7 Options Screen

The options screen contains whatever options are available to the player. This includes things like music and sound effect volume etc. It will also contain buttons to open the help and about texts, as well as a button to return to the main menu.

## 4.8 About Screen

Shows the game credits and shout outs in a auto scrolling text scroller, similar to TV credits. This needs to include all the Dev with Dave links.

## 4.9 Unread Notification

The game will use a  icon added to the right hand lower corner of the UI buttons to indicate that pressing it will reveal a new unlocked item, new daily missions or prizes, or other such things.

The icon can appear on the main menu button, and also on any of the upper six buttons on the Main Menu page. (Possibly the coins menu, to indicate that the rewarded videos are available again if they are limited)

## 4.10 GDPR Consent screen

This screen tells the player about the GDPR Policy and data usage.

It also gives the player the option to see targeted or non-targeted adverts, as well as providing the option to purchase advert removal.

It also links to the privacy policy on the website.

# 5. Trophies

## 5.1 Trophies Overview

Trophies will be unlocked by completing certain in game actions a specified number of times. Each trophy earned will be shown at the end of the game. This will then unlock the trophy on the trophy page of the store and set the tab indicator to indicate there is a new trophy. Tapping on the trophy in the trophy page will reward the player with in game currency. This can only be done once.

The amount of in game currency awarded depends on the difficulty of the trophy. There are three tiers of reward.

## 5.2 List of Trophies

Trophies currently are as follows...

- Travel x distance #1
- Travel x distance #2
- Collect x coins #1
- Collect x coins #2
- Play x games #1
- Play x games #2
- Watch credits to the end (Hidden)
- Unlock all upgrades
- Unlocks all pickups
- Come back to life (hidden)

The values and rewards for the actual missions will be determined during testing.

# 6. Media Required

## 6.1 Media Overview

This section is a list of all the assets required to construct this project. These are to be determined at a later date once the project is further along.

## 6.2 Graphics

## 6.3 Sound effects

## 6.4 Music

# 7. Monetisation

## 7.1 Adverts

Flappy Vaders will display a Google AdMob Interstitial advert at the end of each game.

The player will be able to remove these adverts by purchasing Advert removal through In App Purchase.

The Player will have the option to watch a Google AdMob rewarded advert in exchange for a small amount of in game currency. These are still available even if the player has purchased the in app purchase option to remove the adverts.

## 7.2 In Game Currency Purchase

The player will also have the option to purchase In Game Currency for real world money. There will be several amount options available.

The exact value of in game currency available for each price point as well as what each individual price point is, will be determined later.

The initial price point for in game currency purchase is £0.99. The largest coin pack will contain enough coins to unlock everything and buy a few boosts also.