RUNAWAY ROBOT

February 17, 2017

Prepared for: Victoria Kirst
Zach Maurer

Prepared by: Matthew Mau
Monica Yupa
Tom Kremer
Varun Ramesh

Executive Summary

The mobile gaming industry is booming as Americans continue to devote more and more time to their mobile devices. We plan to release Runaway Robot, a mobile game that appeals to as many American mobile users as possible. Runaway Robot will be a two dimensional side-scroller game where the character automatically moves across the level at a constant rate, and it is the player's job to avoid incoming obstacles by jumping, ducking, or using other gameplay mechanics. This genre, known as a "2D runner," is easy to learn and fast paced, allowing players to start gaming as soon as possible and in short spurts that easily fit into their busy schedules. Runaway Robot will also have multiple levels, each with different settings and unique gameplay mechanics, so that the player experience is varied and engaging. Some of these designs include a level on the moon where the altered gravity affects how the character dodges obstacles, or a level in a cave where a darker palette and lower lighting combine to keep the player on his or her toes. Lastly, we will implement a points system for each level to maximize replayability so that upon completing all the levels, a user still has motivation to continue playing. By using the Unity 2D platform for implementation, Photoshop for sprite design, and Caustic for music composition, our team can make Runaway Robot so that it provides a rich and engaging experience that any mobile user can enjoy in just seconds.

Description:

Runaway Robot will be a 2D side-scrolling runner game where the user must dodge or destroy incoming obstacles in a fast-paced playstyle. However, to create the fullest experience possible that can be consumed in short spurts of gameplay, we will implement a variety of levels that each have different settings and unique gameplay mechanics. In this way, the user can become more immersed in the game world and be

excited by new and interesting strategies to progress through the game without needing to invest much time.

We plan on creating four different levels, each with their own settings and extra mechanics to spice up the standard 2D runner gameplay. These will include:

- A standard level on flat ground to introduce the player to the game's pace and standard mechanics
- A level on uneven ground that makes the player plan a strategy in a the up-down direction through the use of ramps, dips, and bumps
- A level on the moon where gravity is weakened, changing the established jump timing and trajectory and including new obstacles, such as meteors crashing down
- A level underwater where jumping will be replaced with a swimming mechanic, with many underwater obstacles to avoid
- A level in a dark cave that forces the player to react more quickly to incoming obstacles given the limited vision

The implementation of all of these levels will create a new experience for the user in each level by establishing an expansive game world and varied strategies. Furthermore, the way we plan on building Runaway Robot will allow us to easily build new levels to keep up with user demand with new updates or level packages.

Lastly, we will design original artwork and music for Runaway Robot to put an exclamation point on the uniqueness of the game. Many of the most popular games share the same, animated 3D graphics to the point that it is difficult to identify a game by watching someone play it. By creating our own sprites and musical scores, we will be able to tailor the aesthetic and ambience to exactly what we believe our targeted audience will enjoy most.

Need:

Mobile gaming is a distinct niche in the booming mobile industry. At over 8 billion and growing, there are more mobile devices than people in the entire world. [1] Users continue to integrate mobile services with into their everyday lives, from placing phone calls and surfing the web to checking stocks and buying lunch. Nearly everything today must be built with mobile devices in mind, and entertainment is no exception. This makes it one of the fastest growing industries, valued at over 40.6 billion dollars compared to the 35.8 billion and 6.6 billion dollars earned by console and computer gaming, respectively.[2]

Mobile gaming has already surpassed computer and console gaming and will likely continue to grow to satiate the market demand for quick entertainment. Most mobile

[1] GSMA Intelligence, Mobile Connections, 2017 ↗
[2] SuperData, Market Brief, Year in Review 2016, ↗

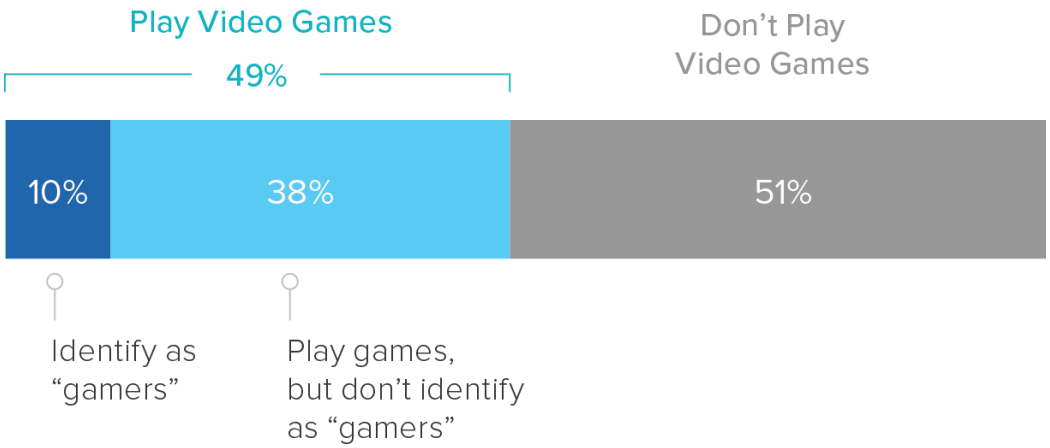
games take anywhere from a few minutes to a few seconds to play, satisfying users' needs to fill up every bit of their time throughout the day. As a result of these play patterns, the lifecycle of the average mobile game is typically quite short, usually taking as little as 20 weeks to reach 90% of estimated market potential.[3]

2D runner games have been underrepresented among the top selling mobile games, which is unusual considering that the genre can combine fast-paced gameplay and creative design so that players get enjoyment almost immediately. We suspect that this is most likely due to the domino effect of game developer strategies: when one type of game becomes successful, many other companies use it as an inspiration for similar games, resulting in a rather slow-moving evolution of game styles. We believe that Runaway Robot can take advantage of the untapped 2D runner genre and provide a new experience for mobile gamers.

Audience:

As a fast growing industry, the audience for mobile gaming continues to grow to include nearly everyone with access to a mobile device. Before 2008, mobile software development served only a small niche of users but with the launch of Apple's App Store and its ensuing competitors, mobile gaming has grown to encompass nearly all users and most mobile devices carry some kind of game by default.

Our main target audience is the group of casual mobile gamers, defined as those who don't identify themselves as "gamers". This group of mobile users takes up approximately 38% of all mobile users, as illustrated below:



Verto Analytics, The Average Mobile Game Day, 2016, ↗

We want to appeal to this group of mobile users specifically because of how large the market is. Users who don't consider themselves gamers spend less time per day and per

[3] App Annie, Mobile Games Lifecycle Shortening, 2016, ↗

session playing games than the heavy or core gamers,[4] so a game that takes less time to learn to play and can go from home screen to gameplay in seconds best aligns with this largest group of mobile game players' use cases.

Demographically, there isn't a specific user we are designing for. Audience composition for mobile games varies depending on the game's barrier to entry, time required, subject matter, and art style. It is not, as one might expect, dominated by males or by younger audiences,[5] most likely because many people already have smartphones, regardless of age or gender. Without this extra cost of obtaining a gaming system, the statistics of mobile gamers closely mirrors the statistic of general mobile users. For this reason, to maximize audience appeal, we hope to design a game that does not lean too far in its appeal to a certain demographic. The subject matter, art style, and music should be just as appealing to an 18 year old male as they are to a 55+ year old female.

Competing Products:

Most other top mobile games such as Pokemon Go and Game of War: Fire Age have additional barriers to entry for gamers that do not focus on the most basic elements of gameplay. For example, Pokemon Go requires players to physically interact with the environment around them and Game of War: Fire Age has an additional storyline that players need to understand to play. To appeal to a general audience of players, including those that do not self-identify as gamers, we want to focus on the most essential parts of gameplay (e.g. challenges and controls). Building Runaway Robot as a 2D runner will allow us to create a type of mobile game that users can quickly pick up and enjoy.

There are some competitor runners on the market, including Subway Surfer and Minion Rush. Although these games are very popular, we think that there is still room for new runners that add new gameplay twists. We will not be focusing on a storyline or environments that could potentially distract from gameplay. Rather, we will present users with fresh new challenges and controls. Moreover, we can allow users to customize certain aspects of the game ranging from music to building their own characters and sprites, which is not widely seen in other competitors.

High Level Technical Design:

We will be using the Unity game development environment, specifically using Unity 2D, for the core mechanics and technicalities of the game's implementation. We will then use Photoshop for sprite design and Caustic for writing musical scores, which will both be imported into the code written in Unity.

---

[4] Verto Analytics, The Average Mobile Game Day, 2016, ↗
[5] Verto Analytics, Mobile Gamer Demographics, 2016, ↗

The game will be split into multiple “scenes,” each of which either represents a menu or a level. Each scene will contain a list of game objects and their spawn locations, allowing the level to be generated progressively just outside of the player’s view so that the mobile device’s hardware is not overloaded when dealing with possibly hundreds of objects. This approach minimizes the processing power needed for smooth gameplay.

High Level Approach:

Runner games present an interesting dynamic that can be heavily utilized in mobile gaming, meaning that we can make a game that is better suited for mobile use than through any other medium. Mobile games are rarely played in long segments, regardless of whether the user is a serious or casual player. A typical session is, on average, between three and six minutes long.[6] Thus, games that ask the user to be heavily engaged, whether through plot or other means, typically only appeal to a specific group. To attract as many users as possible, it makes the most sense to design a game that is easy to play immediately, without too much time spent on explanations, story, or tutorials. Furthermore, mobile games can take advantage of the smartphone’s large touchscreen.

Instead of overlaying buttons, we hope to design an interface for Runaway Robot that allows the gameworld to be fully shown and unobstructed to maximize the small amount of screen real estate. Doing this would require simple and intuitive mechanics so that any player can pick up the smartphone and almost immediately understand the goal and mechanics of the game without having to guess or ask. Luckily, these goals go hand-in-hand, since a game that maximizes screen real estate and has intuitive controls are both eye appealing and quickly enjoyable.

Runner games lend themselves to this style extremely well. They are typically very simple: the character runs from left to right in a two dimensional side-scroller fashion, and has to jump, duck, or perform other actions to avoid obstacles, with the goal being to reach as far as possible or to complete the course. This genre does not emphasize plot, since the enjoyment isn’t from a fulfilling story but rather through fun and frantic gameplay. Not having buttons overlaid on the screen would allow the user to see and enjoy the graphics of the game while also, more practically, giving a clear view of the obstacles ahead for the character.

In this way, we are not simply building a game and arbitrarily building it for mobile, but rather we plan to take advantage of mobile platform capabilities, mobile gaming use cases, and runner game traits.

---

[6] Verto Analytics, The Average Mobile Game Day, 2016, ↗

Resource Requirements:

We will need to playtest Runaway Robot at various phases during its development. In order to do this, we will need a fresh supply of people who haven't seen our game before and are picking it up for the first time.

To set our runner apart from our competitors, we will need more in-game art. Although free assets can be easy to obtain, we have no guarantees that other developers have not yet utilized them in their projects. We may first fill the void with simple computer-generated vector art of simple shapes and designs. However, private commissions from paid artists or our own customized artwork will be the end goal.

Once the game is complete, we may use a small amount of advertising money to get it into the hands of an initial playerbase. These initial players build hype for the game in its opening days into what we hope to be a train of success.

Potential Approaches:

We chose to make our game in Unity, which uses C#, instead of the other viable option, which is in LÖVE2D which uses Lua. There are a couple advantages to this approach - C# has static typing, Unity has a lot of documentation, and we have access to a scene editor. Although LÖVE2D works better with version control and has a library allowing for hot reload so we can write and test code in real time, it is a rather undocumented environment, which can lead to much slower debugging.

One big difference in approaches would be to either start building the mechanics and systems of our game before we decide on the visuals, sound, and story. Alternatively, we could design the presentation first and then code the mechanics with our style in mind. We will attempt a middle of the road approach, by first building an MVP of the mechanics, then starting to define an aesthetic and narrative. As the game evolves, we will then go back and change the mechanics or presentation so that both components fit together in the final product.

Assessment of Risks:

One major risk is the difficulty of obtaining art for our game. To sidestep this issue, we plan to use vector-based programmatic art that consists of simple shapes. While this may hurt our game's wider appeal, the art can be replaced in the future with something more visually appealing to the casual player, which Unity allows for quite easily.

Another risk is the genre choice itself. Since few other top selling mobile games have been 2D runners, it is obviously a risk to deviate from the more established game styles that have been shown to be successful in the past. We believe that the quick lifecycle of mobile game popularity will minimize this risk, but it is understandable why competitors might not have chosen to make something similar in the past.

Next Steps:

Our first step is to build an MVP of the core gameplay. This will include basic implementations of jumping mechanics, coin collection, and obstacle spawning. From there, we need to start designing levels and solidifying their mechanics and obstacles. Throughout the process we will be working through drafts of possible artwork and music so that once the level implementation is completed, we will be able to replace our placeholder sprites and sounds with our more appealing designs.