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Building of Mira's Ghost Cleansing Services

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Building of Mira's Ghost Cleansing Services

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Abstract

In this thesis, I built a PC game called Mira's Cleansing Services. It is a sidescroller game that follows the story of a female exorcist for-hire who is also a high school student. Using ABC Scrum, a modified version of Scrum for game development, I developed the game using Game Maker. Additionally, I created all the art and music in different software. Because of time constraints and because I was working alone, I only developed the first level of the game. However, I plan to continue developing the game after this semester to eventually complete and publish it. My ultimate goal is to enter the game development industry. Game development has become a large and growing field over the past few years because of how video games are becoming a mainstream form of entertainment.

Building of Mira's Ghost Cleansing Services

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Introduction

Video games have gone from being a niche hobby to a popular form of entertainment in the last few years, and many people have been able to delve into the video game development scene. Video game development has many different creative aspects that go into such as art, music, writing, design, and coding. I touched upon all those in the development of my game, Mira's Ghost Cleansing Services-- an adventure sidescroller that follows the story of an exorcist high schooler called Mira. I used a development process that I had previously learned in my capstone software engineering known as Scrum to organize myself and keep up with deadlines. The version of Scrum that I followed was known as ABC Scrum, a modified version scrum developed specifically for game development where the ABC stands for the sprint cycles "Alpha", "Beta", and "Completion".

I chose to create a game because building games is my passion and I love playing games and learning about game development. I can use the work that I created in this thesis as a way to show potential employers what I can do. This game will help me build my portfolio of games as an aspiring game developer and also allow me to gain more experience in game making since this game will just be my second one. My first game was an app called Tranquillitea where players had to drag ingredient combinations into a teapot in order to create a tea and unlock information about it. I had worked in a team to develop it in two months in my capstone software engineering course.

The intended audience of the game is teenagers to young adults, as I believed the story could appeal to adolescents who are dealing with some emotional issues or who simply want to play a game where the main character is someone their age. The controls are classic for sidescroller as the character can only move side to side and jump, similar to other sidescrollers,

such as *Super Mario Brothers*, which would allow people who do not have experience with games to pick it up with some practice.

History

Video games have been around since the 1960s but those early games were not very successful or even widely available until “Pong” (see fig 1) came along in the 1970s^[10]. After that, video games became a new form of entertainment and the first console, known as the Atari 2600, was released in 1977 by Atari^[11]. Nintendo followed up by releasing their Nintendo Entertainment system in 1985 which solidified the home video game playing experience. A few



Fig. 1 Pong

years later in 1989, Nintendo would release the first ever handheld console -- the Gameboy-- which allowed people to play games on the go^[11]. After this, many new game consoles would be released by Nintendo, Sega, and Sony. Nintendo especially goes on to release many handheld game consoles including the Gameboy Advance, the Gameboy Advance SP, the

Nintendo DS family, and eventually the most recent Nintendo Switch.

As of 2016, the mobile game market revenue has surpassed that of traditional console and PC gaming and is expected to continue rising^[7]. This has forced companies like Nintendo and Sega to release games for mobile. One of Nintendo’s most famous mobile games is *Pokemon Go*, and Nintendo still provides updates to that game as well continually publishes new mobile games (see fig 2).



Fig. 2 Pokemon Go

Some experts argue that video game history is more than just the evolution of gaming consoles and platforms, however. John Paul Dyson, the director of the museum International Center for the History of Electronic Games, claims that “video games emerged, and continue to emerge, from older forms of play” such as how early computer games were “re-creations of older games and sports or variations on them”^[3]. Games evolve from taking previously successful aspects from past generations of games. There exists a genre where a player can control a character that is not themselves known as “Role-Playing Game”, or RPG, that encompasses many games published today. *Final Fantasy* was one of the earliest examples of a widely popular RPG that was first published in 1987 and it’s gameplay aspects are still used in the present, such as “Leveling Up”, getting stronger equipment, and fighting monsters in the goal of saving the world. Developers take the best aspects or aspects they liked of previous games including, but not limited to, *Final Fantasy* and make their own games which give rise to other gameplay genres such as sidescrollers, first-person shooters, rhythm, visual novel, etc.

Games have allowed for new forms of storytelling and expression of ideas. Dyson adds that “video games were transforming the way people play, learn, and relate to each other”^[3]. Games can cover topics including history, human relationships, pet care and heavy topics such as murders, time paradoxes, and parallel universes. Although games allow for new ideas and transforming people’s thoughts, the video game industry as a whole has some shortcomings. The game industry is a male-dominated industry^[5]. Many games feature male protagonists while females are usually delegated roles of being the damsel in distress or a supporting character and are sometimes included just for their sexual appeal. Games currently are trying to push this boundary such as *Persona* and *Assassin’s Creed* by including the choice to have a female main character in some of their games, but a majority of the games feature male protagonists.

The rise of indie games over the last decade allows for anyone to get into game making and create games that challenge stereotypes, though. The massively popular and successful PC game *Undertale*, which released in 2015, features a nonbinary protagonist who faces monsters through the game but does not necessarily have to kill any of them. Indie developers have the ability to make any games that they, which means that games will feature more female protagonists, LGBTQ representation, and other topics not previously seen in games often.

The Game: Mira's Ghost Cleansing Services

"Mira's Ghost Cleansing Services" is the game that I worked on for the thesis and I intend to release it for PC. I wanted to create this game because I want to become a successful video game developer. I grew up playing games and believed that this was the path I wanted to take. Originally, I had planned the game to be for Android phones but I encountered an issue with the game export files in my initial development run of the game. Upon the export of the file, the game could not distinguish from the different touch inputs as a result of the game engine I was using.

The game is in the style of classic sidescrollers such as Kirby, Sonic, and Super Mario as it is the most achievable gameplay style to complete in the time I had to develop the game. Sidescroller is a gameplay style where the player controls a character by moving them side to side or occasionally up and down on a 2D plane in order to travel across the level. In the game, the player has to fight



Fig. 3 Mischief Makers

monsters and bosses like in the aforementioned games. My biggest inspiration, however, for this game were games like *Muramasa: The Demon Blade*, *Prinny: Can I Really Be The Hero?*, and *Mischief Makers* (see fig 3). These games have a vibrant visual style and the gameplay for each of the games are slightly different but very engaging and sometimes challenging.

The story revolves around a high school student, Mira, and her not so normal afterschool activities. She runs an exorcism service where she visits haunted locations by request to cleanse the area of evil ghosts. However, she does not want her classmates to find out about her paranormal adventures in fear that she will be teased or shunned so she tries her best to hide it from them. Her efforts to hide her exorcisms are in vain when eventually one classmate discovers the truth. The game continues as Mira tries to minimize the damage while also realizing that the ghosts and hauntings are becoming more violent and abundant for some reason.

Tools

A lot of different aspects go into the development of a game. These include --but are not limited to-- the art, code, music, story, design, and coding. As such, I had to find tools that would help me create the material to make my game look and play nice. The programs I used to help me make the game are Game Maker Studio 1.4, Paint Tool Sai, Photoshop CS6, Soundtrap, and BeepBox.

Game Maker is a game engine which means it is a software that helps make the game development process easier while it still involves coding and getting a hang of the program. Other famous game engines include Unity, Unreal Engine, and Cryengine but those are more powerful and are intended to make very high-quality games. While it is possible for individual developers to use those engines, those engines are usually used by studios or companies

which are made up of many people because of the scope of the games that can be created on them. I used Game Maker because it fits the scope of my project, I had some experience with it, and I had the licenses to export to different platforms such as HTML, PC, and Android on it.

Paint Tool Sai and Photoshop are the programs I used to create the art, with a heavier emphasis on Paint Tool Sai. The art of the game is mostly pixel art and Paint Tool Sai had allowed me to create pixel art. While Photoshop also allowed me to make pixel art, Paint Tool Sai was not as heavy on my computer and it was more simple to use. I used Photoshop to edit any art that I had already created or I used it to type text onto pictures since my handwriting is not neat. I had not taken any serious art classes to teach me how to draw but I had practiced on my own and all the art that appears in the game was created just by me.

Soundtrap is an online music making application. It offers free trials and a variety of instruments to choose from. To me, making the music of the game was the most difficult part of the whole process because I have the most trouble making even a decent sounding tune. However, I had fiddled around with the program before so it saved me the burden of trying to learn how to use a new program before making anything on it. Likewise, BeepBox is an online music making program that is completely free with no sign up needed and it is also a program that I've used before.

Game Development Process Research

In order to start making the game, I had to think of a method I can use to help organize myself and keep deadlines. In my software engineering class, I had previously used the “Scrum” process in order to create an app. Scrum is “a framework for developing, delivering, and sustaining products” ^[9]. In other words, it is a way to help a development team stay on task, meet deadlines, and work responsibly. However, Scrum is more easily applied to software

development that is not necessarily game development. At the start of development, I tried using the original Scrum methods to help organize myself but I found it to be a little cumbersome and it felt as though I was having to follow a strict mold that was not well suited for game development because game development does not have clear cut out phases. Unlike Scrum, a game developer often has to go back to phases of the development constantly to change, remove, or add a new feature and fix issues. Luckily, I found a modified version of Scrum designed specifically for game development.

In regular Scrum, team members are delegated roles such as Scrum Master or Product Owner and development cycles are developed in 30-day sprints.^[9] Scrum for game development follows a similar style but with a few notable differences, especially in the development cycles. In Scrum for game development, sprints are not called “Sprint 1” or “Sprint 2,” but instead “Alpha Sprint,” Beta Sprint,” and “Completion Sprint” ^[6]. In the Alpha Sprint, the team is striving to release a game with a completed concept and basic functionality ^[6]. The alpha version of the game still has some work to be done. The Beta Sprint strives to release a more finished product that contains all of the main features of the game while the last sprint, the Completion sprint, strives to release the final, bug-free version of the game^[6]. Like regular Scrum, Scrum for game development also has Scrum artifacts. Scrum artifacts are the important documents that allow for all team members to have the same understanding of the project at hand as well as have access to key information ^[9]. Both versions of scrum make use of an artifact known as the “Product Backlog.” The product backlog is what lists all the requirements --in the form of user stories-- of the product or, in this case, game (see appendix).

Although the sprints for game development differ from those of the regular Scrum, the user stories do not seem to share that difference. User stories still follow the format of “As a <user role>, I want <goal> [so that <reason>]”^[2]. There is one little added definition, though. In

game development, sometimes user stories are so large that they have to be continued on to the next sprint. In these cases, the user story gets called an “epic” ^[2].

However, the game development process is one that is often time challenging and littered with problems^[8]. One of the biggest problems with game development is related to the project scope and the developers often underestimating the scope of their project^[8]. This leads to the game development process to become behind on schedule and confuse the team as new features are constantly being added in^[8]. Additionally, further scheduling problems and delays can arise due to underestimating how long a specific feature will take to develop^[8]. One of the more significant problems of game development can arise in the Design Phase^[8]. In the Design Phase, the team is supposed to plan out the entire game and its features which include the story, gameplay aspects, art direction and more. Without clear documentation and planning, the team may end up spending time on programming a feature that they will not use.

Sometimes, though, a game development team cannot do anything against some problems they encounter. One such problem is rendering and compiling times^[1]. Rendering is used in 3D games and it is when the computer generates the 3D objects that the player sees in-game. Rendering is known to take multiple hours in animated movies and games similarly take some time to initially render objects in game engines. Code compiling is also another time-consuming process as some game codes can take upwards of 30 minutes or more to compile which adds up when a developer goes back to change one line of code only to then make it compile again^[1].

The final phase in any game development process or software development process is the testing. Game developers allow testers to play the game before release to find any issues. One of the most commonly tested aspects of the games are the user experiences and the technical aspects ^[4]. Game developers want to see if the game is fun and engaging and that it

gets a positive response from a player. They also want to find any glitches, bugs, spelling mistakes, or crashes. It is not unusual to find some game developers go back and add large features into games after testing ^[4].

Developing Mira's Ghost Cleansing Services

My game development process always starts with a very basic premise. I would usually think of a few words or a phrase that catches the feel or plot of the game. In this case, the words that came to my mind were "female ghost hunter." I had always been interested After I have that little idea, I can move on to the main character's design. I moved on to designing Mira in Paint Tool Sai. I chose the name Mira because I believed that a short name but feminine name would suit the main character. I wanted to make a female protagonist because girls are underrepresented in many mainstream and popular video games. While I was drawing, I was thinking of the story of the game and the basic plot while asking myself what would the character be doing. Once I had Mira's basic design down, I was able to move on to planning the game.

When thinking of the gameplay, I had to ask myself what type of game did I want to play. However, I also needed to ask myself what type of game did I want to make that would be challenging but also rewarding to develop. I could have decided to do a puzzle game or a top-down role-playing game, but I decided to go with a sidescroller because it is a classic video game style that has a lot of versatility. I could add as many elements as I wanted while still keeping the core sidescroller gameplay aspects.

With my story, tools, and planning ready, I was able to start making the game. I originally started making the game using regular Scrum, so I created a product backlog with some of the requirements I could think of. For my first iteration of Scrum, I had gone through almost

complete game development cycle when I was still attempting to create the game for mobile devices. I had to stop that development because Game Maker games cannot support multiple

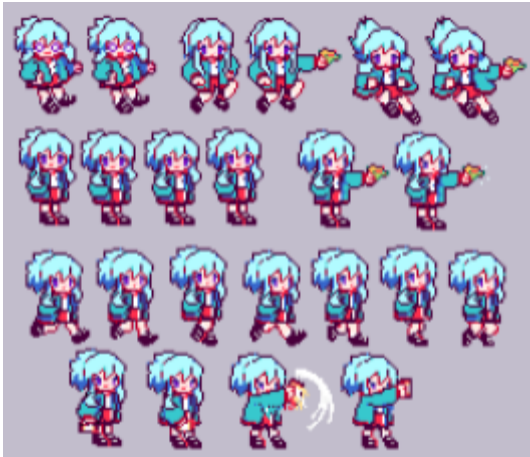


Fig. 5 Mira Sprite Sheet

touch inputs on a screen. While it is possible to program games to accept multiple touch inputs, the games on Game Maker cannot distinguish between a touch being a tap, hold, or swipe. As a result, the original mobile game was playable but it was very buggy and did not work as intended. However, I was able to use the art(see fig 5) and other assets that I had created and apply them to the computer version of the game which allows me to start Sprint Alpha with some work already done.

In Sprint Alpha, which lasted about a month, I revamped the menu button and worked on the core gameplay aspects of the game such as the Player's control of Mira and the collision detection Mira and enemies. The city map remained the same but I added a hovering select icon to simulate as if Mira were walking through the city. For this section of the cycle, I was trying to get down the basic functionality of the game so that I would be able to run and test the game in the next sprint since it would be much more difficult to test the game if I did not have a basic framework. Game Maker has the option to run and test the game straight from the engine so that developers can play their games as they program. I used this function innumerable amount of times.



Fig. 6 Main Menu

Sprint Beta lasted 20 days. It was the sprint where I focused on polishing the game and switching out placeholder art and functions with newer art and appropriate controls. For example, Mira's health points bar used to just be sloppy hearts until I replaced them with the final bar. I switched out the first level's backgrounds and fixed a few bugs relating Mira's directional controls. As I encountered bugs during development, I tried to fix them up right away if I could so that I did not forget about them. Sometimes, however, I could not figure out a



Fig.7 Level 1

solution right away. Whenever I became stuck and frustrated, I would take a break. My mind would be fresh when I would go back to work on the game. The monsters for the first level (see fig 7) were particularly troublesome to develop and I found myself putting hours into trying to get the enemy movements and animations correct. Programming the monsters was one of the aspects that took me the longest

to develop for the game.

In Sprint Completion, which lasted a week, I tweaked some features and aspects such as the music and sound effects. My goal was to make a more finished game free of bugs I had missed during development in order to make the game have a sleeker playing experience.

Reflection

This whole game development process has been frustrating but mostly rewarding. I have been able to learn more about how to program with Game Maker and I feel a lot more comfortable using the program than when I started and, as a result, am considering using Game

Maker more in the future to make computer games. However, I had run into a few problems developing the Android version of the game, especially problems involving the original mobile controls which took up a lot of my time. I do not necessarily believe that the problem was the code but more that Game Maker is not the most suitable program for game development for Android. If I were to try developing a game with similar controls, I would not be using Game Maker again but rather something like Unity since it is more powerful and has more functionality. However, Game Maker continues to release newer versions of the software with new features so it is worth looking into.

Conclusion

As much as I would have liked to develop the full game for this project, I settled on just developing that one level to the best of my abilities because it would have been very difficult to develop a game of that scope in such a short time period since game development often takes several months. Games are usually developed in teams as they have access to more resources such as having more people working on the game at the same time.

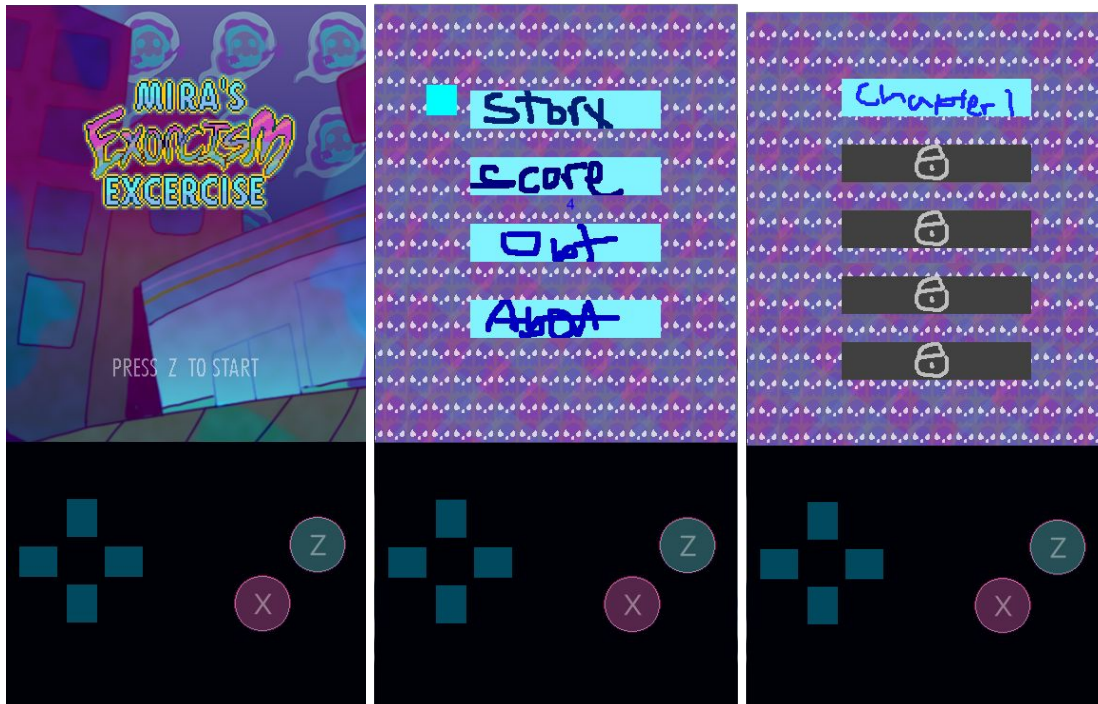
I will continue developing Mira's Ghost Cleansing Services. My next steps include adding all the exorcism levels of the game as well as school stages so that a player can explore Mira's school and learn more about the in-game lore. I would need to complete about 20 levels in order to complete the story. Additionally, I will add the score attack mode and a boss rush mode. Once the game is completely finished, I want to publish it on game sites such as Steam and itch.io.

This project has inspired me to push myself harder. It makes me excited at the prospect of creating more games. I plan to create more games using different engines and programming languages. I can create games touching upon many other topics and hopefully become a successful woman in the field like Pace alumni Nina Freeman.

Appendix

Link to game: <https://ashleyvargas.itch.io/mira?password=av>

Original Mobile Sprint 1 screenshots:



Original Product Backlog

PRODUCT BACKLOG

Name: Mira's Exorcism Exercise

Product Owner: Ashley Vargas

ID	Name	Creation Date	Description	Size	Priority	Dependencies	Notes	Sprint
US1	Mock control pad and buttons	9-18-2018	As a user, I want to be able to play on the phone as if it were handheld console such as a gameboy, as well as control the game character and the menu cursor.	Medium	High		This will take up a bottom portion of the phone screen. It will always be on screen as long as the app is in use.	1
US2	Title Screen/Start Screen	9-18-2018	As a user, I want to be introduced to the app and have an idea of the game before I start.	Small	High	Home Screen		1
US3	Main Menu	9-18-2018	As a user, I want to choose what I want to do in game and see what choices are available to me.	Medium	High	US2	The user can choose between the following: Story Mode, Score Attack, Options, and About.	1
US4	Story Mode Menu Screen	9-18-2018	As a user, I want to select what level of the game I will start from and get an idea of how many level I have to complete in a particular section of the story.	Large	High	US3	This screen will be in the style of a map.	1
US5	Score Attack Menu Screen	9-18-2018	As a user, I want to see the options I can take for the score attack mini game.	Medium	Medium	US3	The user can choose between the following: Timed or Life	1
US6	Options	9-18-2018	As a user, I want to be able to control and change some aspects if I need to.	Large	Low	US3	Options include: volume, and maybe some aesthetic changes.	
US7	About Screen	9-18-2018	As a user, I want to learn about the creator of the app and more information about the game.	Small	Medium	US3	Some information about the game, version, etc.	
US8	Character + Monster Sprites	9-18-2018	As a user, I want to have a fun, immersive experience and see the in-game world.	Large	High			A
US9	Level Map	9-18-2018	As a user, I want to select the level I want to play and also be able to revisit past levels.	Large	High	US4		A
US10	Autosave	9-18-2018	As a user, I don't want any of my progress to be lost.	Large	High			B
US11	Music	9-18-2018	As a user, I want some sort of music playing to make me feel more immersed in the game.	Medium	High			
US12	Sound Effects	9-18-2018	As a user, I want the game to sound interesting and not boring.	Small	High			
US13	Multi-Touch	9-18-2018	As a user, I want the app to still work even if I'm touching the screen in more than one place.	Medium	Medium		Game Maker by default doesn't register more than one touch at a time unless the app is programmed to.	1
US14	Score	9-18-2018	As a user, I want to be able to see my score on each level and have my highest score recorded for future reference.	Low	Low			B
US15	Speech Bubbles	9-18-2018	As a user, I want to learn about the story and characters through dialogue.	High	Medium			B
US16	In-Game Level	11-12-2018	As a user, I want an actual game to play where I control the main character and advance the story.	High	High			B
US17	Score Attack Level	11-12-2018	As a user, I want to also be able to play the game without necessarily advancing the story.	High	Medium			

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Fig. 3 666Gonzo666. "Screenshot of Mischief Maker." Moby Games, 24 June 2013, www.mobygames.com/game/n64/mischief-makers/screenshots/gameShotId,625453/.