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Game and Level design

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ABSTRACT

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This thesis was written in the cooperation with the game development company called Super God Ltd. Super God Ltd. develops video games for mobile and PC platforms and was looking for students to design a possible future game project. Main goal of this thesis was to design a mobile game concept and create 20 prototype levels for the testing.

This thesis contains the basic concepts of game development and its stages with the concentration on mobile platform. It explains the most important parts of game development and applies to the case project where the main source of information was authors' imagination. Most parts of game design were covered to their full extent except several which are mostly decided by the Super God Ltd. The thesis also includes important numbers to showcase why the mobile platform was chosen for the development.

The result of this thesis is a complete game design document for the story driven tower-defense survival mobile game with 20 levels with detailed description for each of them. Development process consisted of cooperation between two authors and division of work into parts which were done individually by one or other author. The game design document and level descriptions were approved by the client company but the requirement to prototype those levels wasn't met due to the lack of skill and technical difficulties.

Keywords: game design, game development, mobile games, level design, game concepts

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1 INTRODUCTION

Video game industry has become a significant trend throughout the years and has been growing since then. It has become another form of entertainment which is now above the previous leader – Television and Media. There is countless amount of games produced on many platforms such as PC, large amount of various gaming consoles and mobile devices. Large communities of gamers have been formed from all these platforms and, even though it is expensive to develop games, it still tends to be profitable enough for such business as game industry to grow with each year.

It used to be that PC and gaming consoles lead the market with the amounts of revenue they generated and how many possibly they have but when the first smartphones appeared the situation changed drastically. New ways of game monetization appeared which are still proved useful and most profitable of all. Mobile games are designed specifically for smartphones and tablets, but recently they have started to appear on PCs and consoles. Free-To-Play and Freemium have become the main sources of income on mobile devices and are currently starting to be used on other platforms. The top charts of mobile games are being taken by free-to-play games (ThinkGaming 2019, cited 22.01.2019).

This thesis concentrates on mobile games as it was done for the game developer company Super God Ltd. It also includes the fundamental information about the video games and game development process in general, as a theory base of the creation of a prototype and game design for the game. The requirements were minimalistic and mostly consisted of creating a game design and about 20 levels in 2D for the startup event for game developers. The basic game mechanics should be more targeted on casual players rather than advanced ones. Otherwise, the game and level design can be done without any restrictions.

The thesis includes only the Pre-Production stage without the creation of an actual game but only prototypes of levels and general game design. The tools which were used are GDD (Game Design Document) and Map Editor. Also, all the information was gathered, researched and used as a theoretical basis for this thesis.

Chapter 2 of the thesis introduces main concepts of Mobile Games, Mobile Games Market and fundamental ideas to consider during the development of all the video games. The 3rd chapter

describes 3 phases of games development. Each of sections contains the most crucial parts of those phases.

After that, there is a pre-production phase of the chosen game project for Super God Ltd. It is divided into 2 parts: Game Design Concepts and Level Creation and Prototyping. The main focus in Game Design Concepts is on using the template of Game Design Document, to design the game from the ground up while in Level Creation is about creating a visual prototype of several in-game levels to show off the basic understanding of game mechanics and visuals.

The last parts of thesis are Conclusions and Discussion where all the work done will be summarized and then discussed about respectively.

2 MOBILE GAMES

This chapter consists of the basic general information about mobile games and important concepts which are used in the development of a successful mobile game. Those concepts are also used in the general video game development as the border between a mobile, console and PC game has become quite transparent.

The chapter has two sections which were chosen according to the information which is relevant for the market of mobile games today and what should be taken into the consideration when creating a mobile video game. The sections will contain mostly the description of the concepts but also some thinking will be done about them.

Mobile games started to appear after the release of a “Tetris” on MT-2000 in 1994 and after 3 years Nokia has released “Snake” together with their Nokia 6110 (PhoneArena 2014, cited 1.01.2019). These two pioneers of mobile video game market created the term a “Mobile game” and from now on all mobile games are the games that can be played on smartphones, tablets and all the other mobile devices. The popularity of such games was mostly created by the familiarity of the people with video games but the fact that mobile games can be played anywhere and at any time led mobile market to where it is now.

2.1 Market

Mobile games market is quite widespread as games that are played on mobile devices are accessible by everyone who has a smartphone or a tablet. Gaming in general has become much more popular throughout the years and now is placed at the top of all the entertainment categories in revenue generation (figure 1). And the number of gamers worldwide is already quite large to sustain its position for the years to come (figure 2).

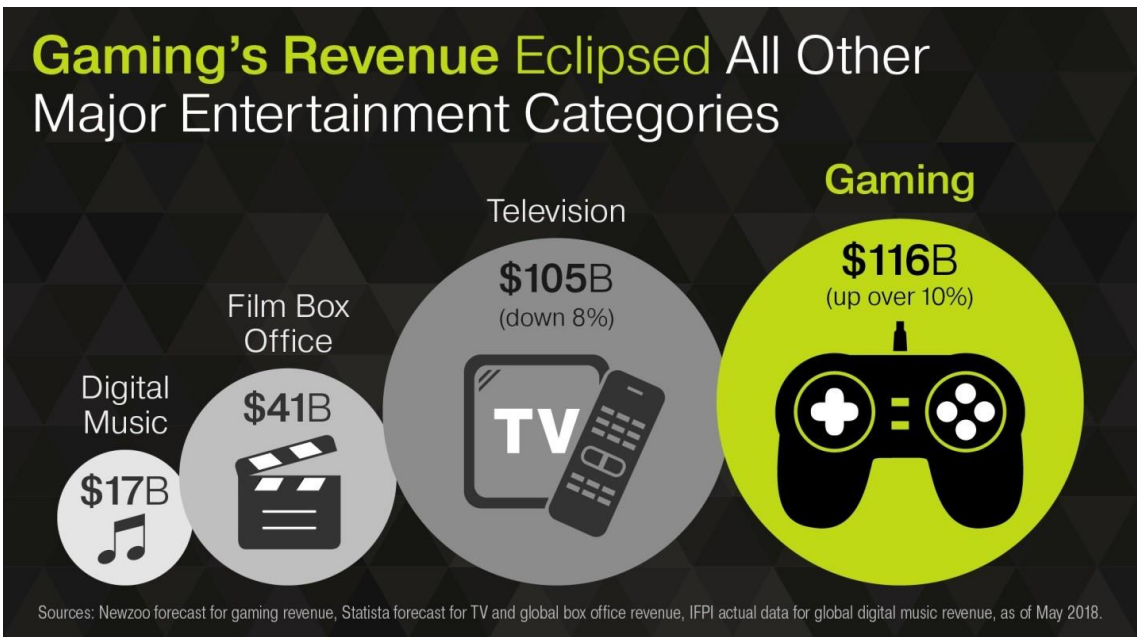


FIGURE 1. Gaming's Revenue in comparison to other entertainment categories (D'Argenio, A. May 2018, GameCrate, cited 2.01.2019)

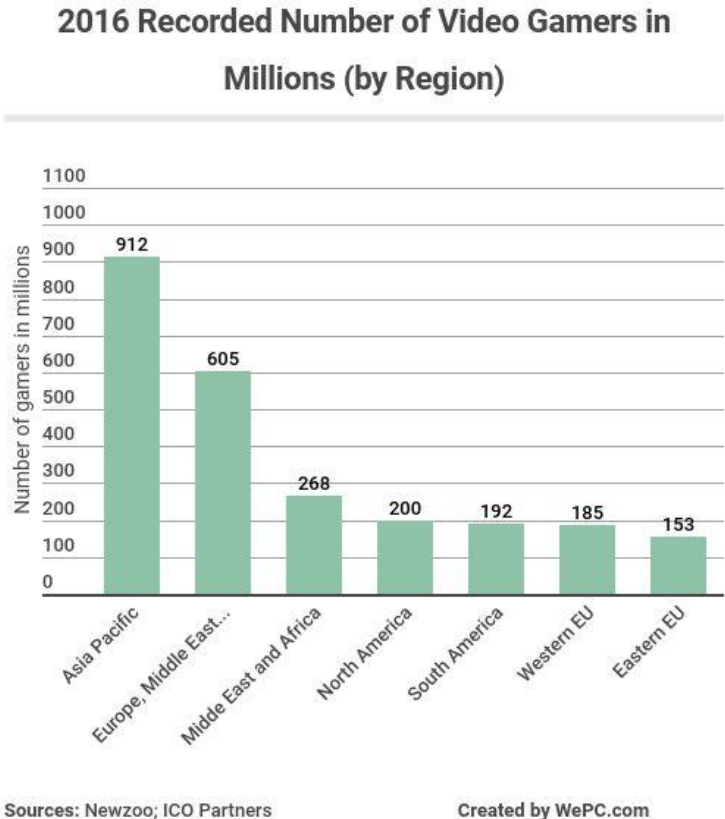


FIGURE 2. Number of Video Gamers Worldwide by region (WePC 2016, cited 2.01.2019)

Even now the mobile games market generates the largest part of the revenue from the whole amount and it is expected to grow further (figure 3). This is mostly because of the monetization models, additivity of mobile games and the same fact that it can be accessible anywhere nowadays.



FIGURE 3. Growth Expectations up to 2021 (Newzoo 2018, cited 3.01.2018)

The biggest amounts of revenue are coming from the Asia-Pacific region and the biggest mobile games consumer there is China. At the same time North American region with the US as a leader takes the second place of global games market (figure 4).

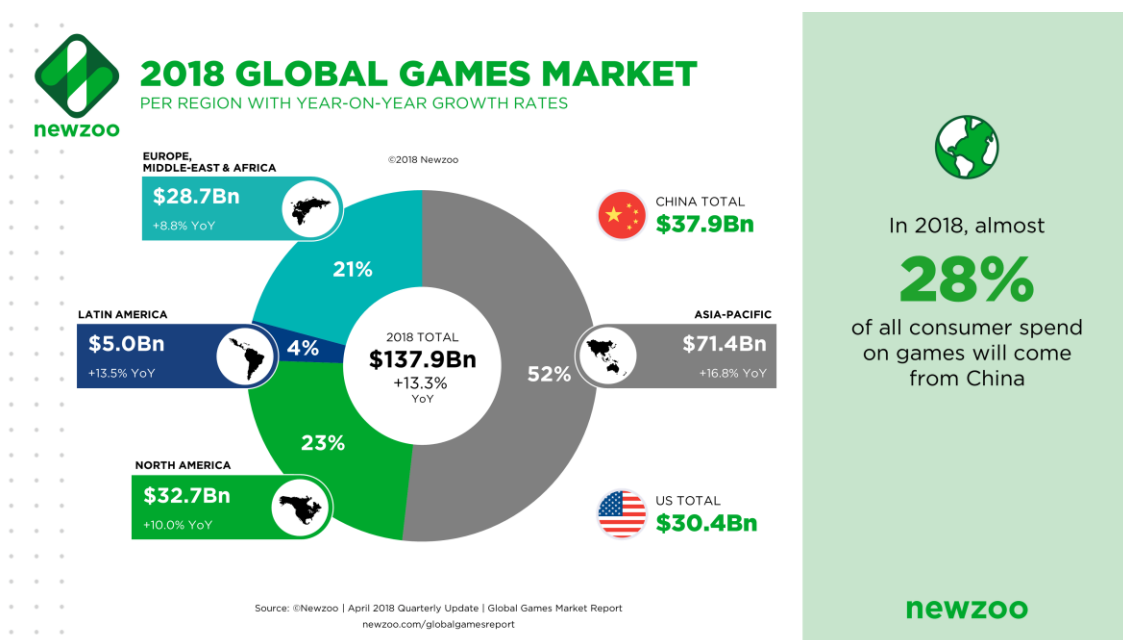
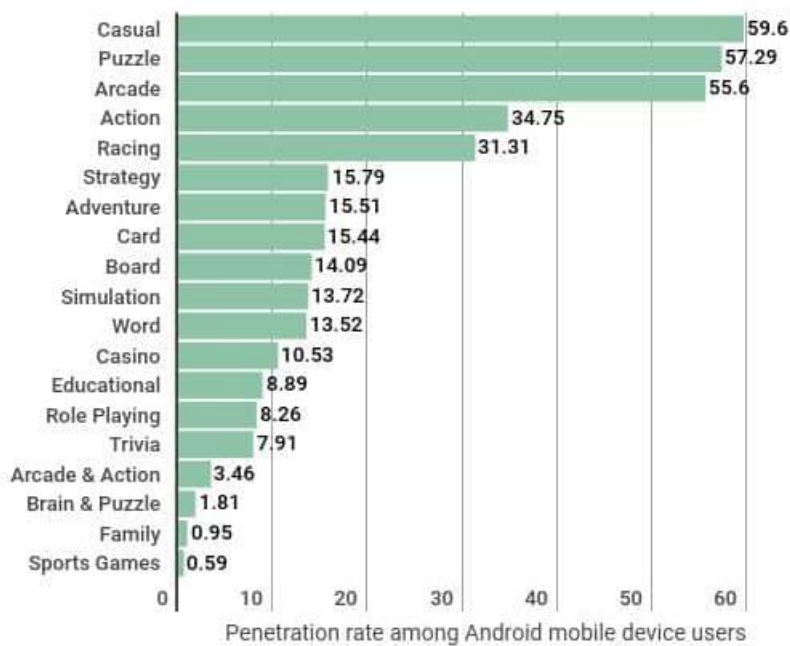


FIGURE 4. Global Games Market Share (Newzoo 2018, cited 2.01.2019)

Currently, the mobile market is being dominated by the clones of one certain genre of a game which was able to make a breakthrough. The most popular game genres in mobile gaming are Casual, Arcade, Puzzle and Action/Adventure which can be explained again by the fact that mobile games are portable and can be played in small sessions at any time anywhere and these genres usually do not require that much of your time to play them (figure 5 and figure 6).

Worldwide Market Reach of the Most Popular Android Gaming App (September 2017)



Source: Shared2you

Created by WePC.com

FIGURE 5. Most Popular Android Genres (WePC 2017, cited 3.01.2019)

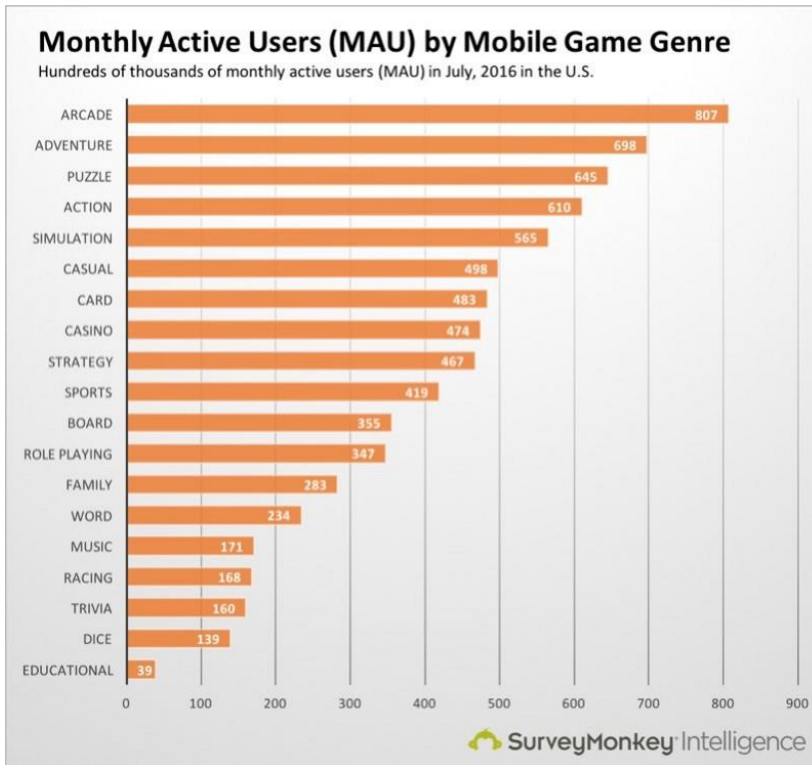


FIGURE 6. Most popular Mobile Games Genres in U.S (SurveyMonkey 2016, cited 4.01.2019)

As for now, the leaders of mobile platforms are Android OS and Apple iOS and both of them have their own app markets full of mobile games in different genres. Division of a market share between them is somewhat equal but currently Android with Google App Market generates more revenue than the Apple phones (figure 7). However, both platforms are mostly differentiated by the quality of the products in their respective app stores. Also, the availability for the masses due to the pricing influence the statistics and quality of products for the mobile platforms.

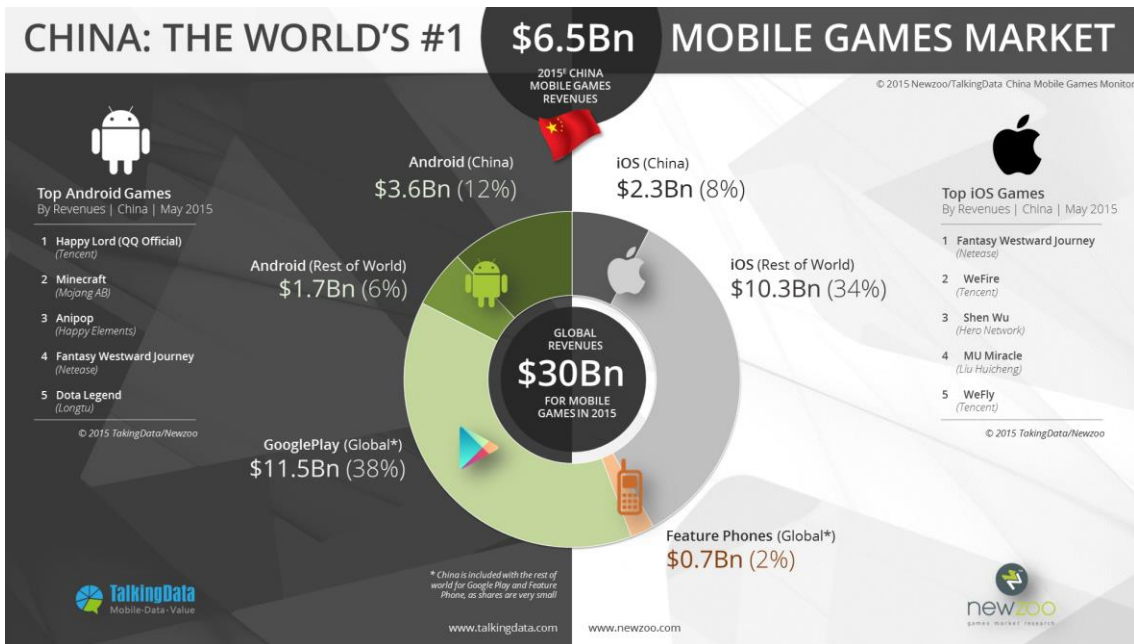


FIGURE 7. Mobile Games Market by Platform (Newzoo 2015, cited 4.01.2019)

It is predicted that in 2018 the mobile market generated 51% of the whole revenue share in video game industry which proves the points of how fast it is growing but it does not mean that people are starting to play less on other platforms, it means that there are just more people playing mobile games and are willing to pay for them (figure 8.)

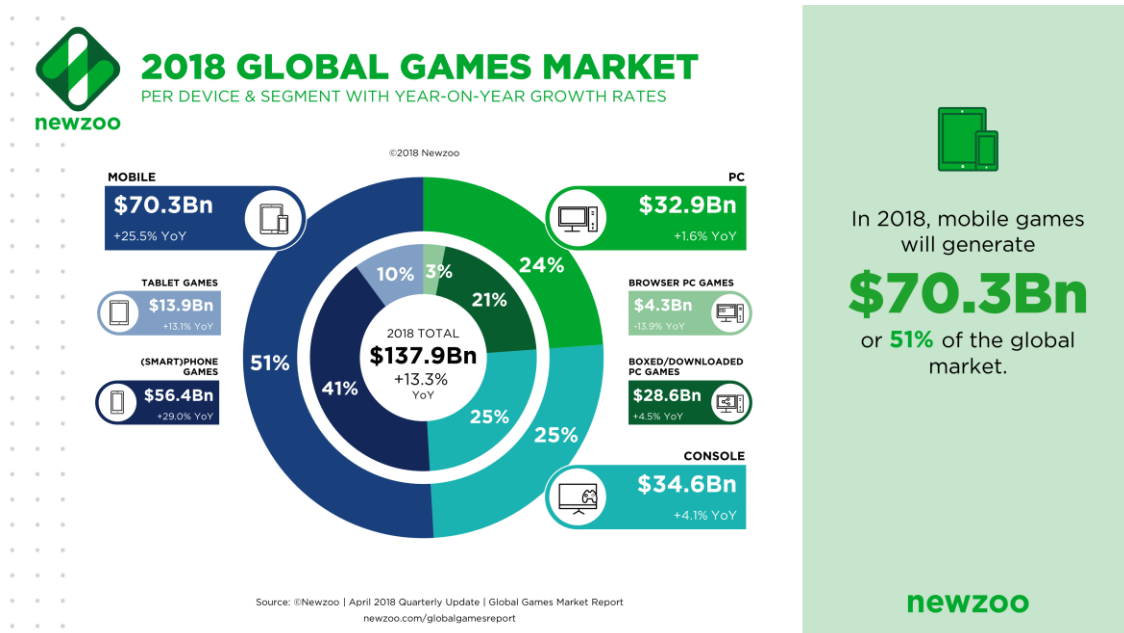


FIGURE 8. Global Games Market (Newzoo 2018, cited 2.01.2019.)

As it can be seen from all the statistics given it is quite obvious that mobile gaming is becoming more and more popular which can be debatable if it is a good trend or not mostly because for today it is about quality versus quantity.

2.2 Important Concepts of Mobile Games

Mobile games, just as the video games in general, have important concepts to consider when developing the game itself. Each of the concepts is connected to the other one and none of them can be neglected. To make a good video game it is important to always take into consideration how it was done in other projects.

In this section, only 5 of all the development concepts will be mentioned and because most of those concepts are the same as for creating general video games the information will be based on video game development in general. Some concepts have small differences and they will be stated in a comparison format.

The concepts are not in a certain order.

2.2.1 Genre

All the video games are defined by the game mechanics. There are a lot of various game genres which can have sub genres or a game can fit to the category with multiple game genres at once (Vince 2018, cited 02.01.2019). The game genre is chosen by the target audience to which the game is being made for.

Main game genres can be defined as:

- Action Games
- Action-Adventure Games
- Adventure Games
- Role-Playing Games
- Simulation Games
- Strategy Games
- Sports Games
- Puzzle Games
- Idle Games.

These genres are the foundation for the many sub genres which can be used successfully with all of the mentioned above but it is important to decide on a certain one so it would be easier to decide on game mechanics and basic flow of the gameplay.

There are also game genres that can be separated into an individual category by the author's personal experience and knowledge such as:

- MMO (Massively Multiplayer Online Games)
- Programming Games
- Board Games
- Trivia Games

Not all those genres work or is possible to use in Mobile Game markets. As it was mentioned in previous chapter mobile games usually played in sessions which means that the game genres must be light for the players to not to be overloaded with the information or game mechanics of the game they are playing. Even though, some PC just as mobile games are being ported to one another by some developers but in case of mobile games, one of their advantages is that their gameplay is usually simple which makes them easily portable while PC games tend to have genre mechanics heavy games and not all of them can be ported according to the thesis authors' knowledge.

In this thesis case the main concentration is on Action-Adventure with Tower Defense and Arcade elements. Action-Adventure genre consists of such gameplay where the game uses two game mechanics of both action and adventure which means that there are obstacles or quests that must be conquered by using logic and action. It does not purely challenge the reflexes of a player but always keeps the player busy with something happening on the mobile screen with a story driven adventure. The game can be considered an Arcade because of the future simple gameplay with the Tower Defense and Tower Offense features where a player will have to battle hordes of enemies by either in defense or offense. As a great example of such concept the game called "CastleStorm" can be noted.

2.2.2 Entertainment

First video games were created with the fun and entertainment in mind. Some games bring people such as friends, families and complete strangers together forming a community or even a fan base

of a game. For example, coach-party genre of games is not as popular between developers as it was before but still fun and entertaining for people of all ages. It does not matter what kind of genres you prefer or what games you play because usually all the games with the possibility are fun to play for everyone because they bring interaction and connectivity (Rich Taylor 2014, cited 5.01.2019).

In any genres of games there must be at least some entertainment, otherwise, people will not be playing it. Most of the PC and Console games usually require much more immersion and skills to play certain games but there are some that can be enjoyable even if you are a casual player. Mobile games on the other hand are usually simple and don't need people to be concentrated too much. This leads to the definition of what makes games fun for individual people according to the thesis authors' experience.

There are categories of what causes players to have fun in games:

- Extremely Hard
- Hard
- Normal
- Easy
- Trivial

By breaking down each category it should be mentioned that there are a lot of players and each of them enjoy games in their own manner.

Extremely Hard games are usually the ones that rely on skills and on how determinant the player is in his completion of a task\quest\adventure. Such games cannot be completed by using your own luck and are based on the mechanic called Trial-and-Error where player is rewarded greatly for completing difficult tasks and punished heavily for their mistakes. These kinds of games produce entertainment from the feeling of accomplishment and player's determination. Example of such game is "Dark Souls" series (IGN 2016, cited 15.01.2019).

Hard and Normal can be united into one category as there is only one difference between them and it is a core gameplay of a game. It is not possible to assign certain genres to how difficult the games are as it is quite possible that action games can be easy or hard to play depending on the developer's decisions. Most of the PC, Console and some of the mobile games are in this category

and this is the most common one. These games require some skill but can be completed on luck or casually.

Easy games make up a large amount of the whole Mobile market and take some part on the other platforms. These games do not require player's skill be the first requirement but more of the pattern recognition and basic logical thinking. One of the good examples to this is "Candy Crush Saga" but there are quite many other games in completely different genres that fit this category. Usually, they are played to skip some time or to complete the story part of the game.

Trivial games are always played to skip time when people have nothing to do. Just as the category name suggests, it is usually consisting of games in Trivia genre where players try to answer questions for which they receive rewards\points. An example is "QuizUp" or games in "Hidden Object" genre.

In case of this thesis the game will have normal or hard entertainment as it will have too many aspects to consider about the game to be Easy or Trivial.

2.2.3 Game Mechanics\Game Loops

One of the most important parts of any game is its gameplay, or, in other words, gameplay loops. There is a big difference in game loops for mobile games and games for other platforms as mobile games are usually much simpler in their gameplay. The core gameplay loop consists of basic actions players can take at any point in the game which makes up the cycle that can be repeated by the player to do main actions (Lovato, N. 2017, cited 7.01.2019). (figure 9). This core loop defines if the game is fun to play or not.

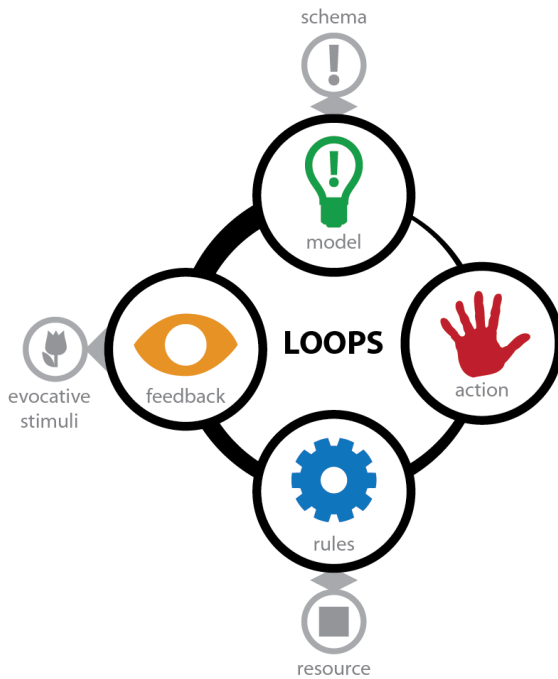


FIGURE 9. A schematic representation of game loops (GameAnalytics 13 Jul 2017, cited 7.01.2019)

Core loops builds upon itself throughout the progression made by the player, so the final picture of the whole gameplay loop looks like a tree with different branches for each of the actions player is able to do in the game but it is important to keep clearly defined and simple core loop. It may change many times during the further designing process, but it is important to concentrate on main mechanics that the player will constantly get back to every time after certain action. So, the game developers should concentrate on polishing the fundamental loop of actions rather than quantity of possibilities which are optional or not important.

The game designed in this thesis will not have a wide gameplay loop in the beginning, but it may be opened up by adding more mechanics to it later as it will be done in a way to be able to continue it on the go. Game's core loop will be described in the next chapters more broadly. Mainly, the player will have to follow the cycle of progressing through levels by shooting enemies and receiving rewards for completion of main and additional tasks.

2.2.4 Target audience

Target audience is the demographics and interests of the majority of its players (Carroll 2017, cited 10.01.2019). The target audience is one of the factors why developers even make games. Without

the appropriate research of the future player who may be interested in the game it is almost impossible to make a successful marketing campaign or to develop beneficial game title.

As it was mentioned in the previous section, target audience is in close dependency with basic gameplay. It is important to design the game that fits the chosen audience, otherwise, there is a big probability that only a tiny amount of all the players the company aimed to will be enjoying the game. It is better to do a successful game with simple mechanics which will be popular among the strong fan base rather than creating a masterpiece which will be ignored or will not satisfy the players and then eventually forgotten.

Target audience of the designed game will be mobile users of the western market. Mostly because Asian market and most importantly, China, has laws that probably will require some changes in the game design of the mentioned game (Wong, F. 2018, cited 19.01.2019). The players of this game will be the ones who can play in short or long sessions each day to complete at least 1-2 levels to progress further in the story.

2.2.5 Monetization Method

This is the part that also connected to the Target Audience. It is crucial to choose the right monetization method of a game on the pre-production stage as it will decide how the game will develop after the release and how the developer will get revenue from the made product. The choice of the method depends on the standings of the game company and they relate to their players. Some of the methods are being abused by large corporation turning players into payers (Hogan 2018, cited 15.01.2019).

Currently, there are 3 possible popular methods of monetization for all the platforms and 1 more for console and PC only:

- Premium
- Subscription (PC\Console only)
- Freemium
- Free-To-Play

There is a pattern of those methods that shows which of them work better for which platform and it is necessary to choose the correct content of the game to monetize considering the game genre, mechanics and overall length of the game (Morel 2012, cited 20.01.2019).

Premium

The most common and usual way of distributing the game. Players pay a certain amount of money for a full game and play it until they complete it or switch to another one. It has become a popular trend for developers to make DLCs (Downloadable Content) which add more features to the game after the launch, but for which players also might have to pay if they want to have it. Ordinarily, DLCs increase the story content of the game and cost almost a half of the original game itself or even the same price or they can be just cosmetic items and in this case they cost less. Recently it has become popular to create “Loot Boxes” in multiplayer games with Premium method of distribution. At first these “Loot Boxes” consisted only of cosmetic items such as costumes, weapons, faces and everything else that can be changed on the character without affecting the gameplay itself, but soon enough it has caused a heavy backlash when some companies started to include whole parts of the game like additional characters behind the “paywall” which is more common for Freemium games.

Subscription

The method used only in MMOs (Massively Multiplayer Online Games) which asks the player to pay monthly for the game to be able to play it. Usually by paying monthly subscription players receive all the in-game content for free but there are some exclusions just as with DLCs in Premium model.

Freemium

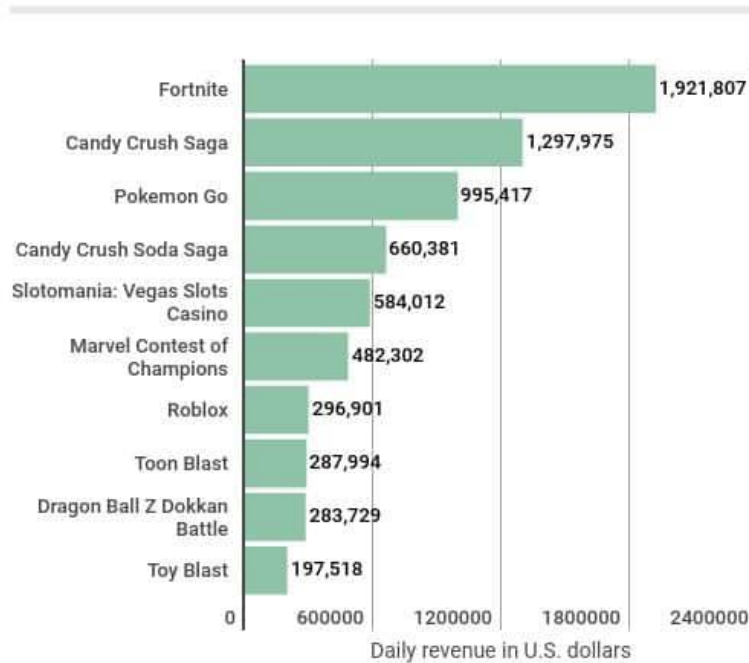
The model which combines Free-To-Play and Premium together. It is essentially a free game but with the in-game purchases. In short, the core of the game is free for everyone but if the player wants to open rest of the game or to get some premium features then they have to pay to the developer. Freemium model is gaining more and more popularity on all the three platforms lately. It is the great model which is usually implemented poorly as the idea behind the freemium model is that a free game has higher rates of downloads rather than premium one. While players will be using the game for free, the overall amount of in-game purchases will exceed what could be made by keeping the game in premium model (Nations, D. Lifewire 20 Mar 2017, cited 20.01.2019). Another way of gaining revenue in such model is advertisement which can be turned off if the player will pay.

Free-To-Play

The model is no longer as popular as it used to be before Freemium but the main point of such model is to give to players only a portion of a game for free and then making the game either harder so to proceed further some checkpoints players will have to pay for in-game items or to demand payment to continue playing straightaway.

The best model for the game in this thesis would be Freemium as it was proven many times that the correctly implemented Freemium generates the largest amounts of revenue from games (figure 10). Inclusion of cosmetic items and advertisements would already bring revenue on a Mobile Market in this case.

The List of iPhone's Top Grossing Mobile Gaming Apps in the United States in U.S. dollars, ranked by daily revenue (as of January 2018)



Source: Think Gaming

Created by WePC.com

FIGURE 10. Daily Revenue of Popular Freemium Games (WePC 2018, cited 20.01.2019)

3 THE PHASES OF GAME DEVELOPMENT

This chapter describes the work itself that goes into development of a new game. The process of game development can be described in three main phases: pre-production, production and post-production phase (figure 11). Pre-production phase consists of everything that happens before programming and designing of the game, such as creation of the idea and prototyping. Production phase is about the programming, design and asset work that gives the game its form, and post-production phase consists of the testing, launching and maintenance periods of the game. (Saimi 2018, cited 1.3.2019).

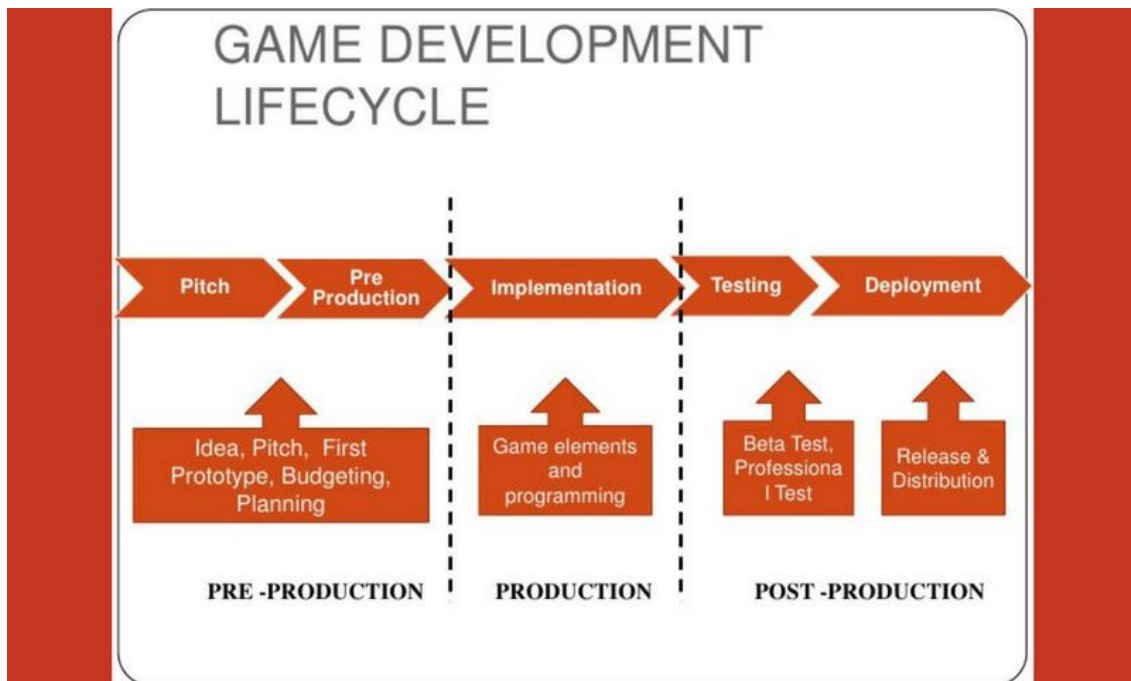


FIGURE 11. Game Development Lifecycle (Saimi 2018, cited 1.3.2019)

Game development used to be less complicated and less demanding. Advancements in graphics and sounds, living game characters and emotionally ever-bar-lifting stories mean that the process of creating a game demands more skill than before, leading to a need for hiring specialized team members for certain roles in a team, which in turn increases costs of developing a game (Chandler 2013, preface). It is not impossible to make games alone, though, and sometimes such games get surprising amounts of popularity, with games such as Undertale, Stardew Valley and Papers, Please being prime examples (Heller & Roberts 2017, cited 20.3.2019), but most of these one-developer games cannot compete for same amounts of audience and customers as ones with larger teams of game designers and programmers.

3.1 Pre-Production

The process of creating a game begins from an idea for a game. This is practically true for every game, be it a high-budget title or a small-scale project, but the ideas themselves vary greatly as do the reasons for developing a game. Some games attempt to invent new experiences, some aim to improve existing ones, and some are made to make money. Pre-production is the phase where these ideas are refined, and a game is being designed. In this phase a game design document is created, and developers start to work with the concept and prototypes for their game.

Depending on the game being designed, the developers have varying amounts of freedom towards designing it. A game designed from ground up is limited only by its developers' imagination, while a game based on certain franchise or a simulation that attempts to recreate a real-world event have certain limitations on the game design. For example, a licensed game based on a sport, such as hockey, needs to comply with the rules of the actual sport, although it is possible to include additional features and teams to improve game experience. (Edwards 2006, cited 22.2.2019.)

It is in this phase when the developers attempt to gain approval of a publisher towards the game. Approved projects are funded and get visibility and advertisement, but if the publisher doesn't find the game profitable or doesn't approve it for some other reason developers have to either scrap the project and begin anew or try to find another publisher willing to approve their game. Indie games are developed and released without publishers, but these games tend to get far less attention due to the lack of visibility and marketing. This can be countered with a good marketing strategy and effective usage of social media.

Prototypes are essential tools to validate the game idea before starting to build an actual game. They allow the team to evaluate their project and identify what works and what doesn't by emulating the player's actions during the game. These prototypes are often used to pitch the game for a publisher. The prototyping process may also come up with unexpected results, which can be used to improve the project or create new ideas for new games. (Macklin & Sharp 2016, chapter 10.)

3.2 Production

The game enters a Production phase as the developers begin to write code and start designing the game's art, levels and sounds, and finishes as they prepare to release the game. This phase can be divided in two subphases: creation phase and optimization phase.

The creation phase involves the developers being arranged to begin working on one of the three production cycles that are part of this phase. The design cycle consists of the basics that form a gaming experience, such as features, gameplay, user interface and playtesting, the art cycle covers the creation of art for the game and assets such as characters and environment, and the engineering cycle incorporates the coding of the features, debugging and build upkeep. Each of these cycles prioritize to attempt to achieve the best possible result, but a key for a good game is in balancing these goals. (Chandler 2013, chapter 12.)

Upon finishing the creation stage the game needs to be optimized to balance both the design and code parts of the game. Optimization can be prioritized towards a certain goal, for example improving the graphics at the cost of game running at lesser frame rate or vice versa. It is also very important especially for mobile game developers to realize that there are lots of different devices each with different capabilities to run a game. A technically demanding game will alienate users of mobile devices with less processing power due to how it runs on their device. (Edwards 2006, cited 22.2.2019.)

3.3 Post-Production

When the production phase ends with a feature-complete game, developers prepare it to be played by their testers to ensure the game functions as intended. This version, called Alpha, features the main functions of the game while implementing some minor functions along the way. Developers will then use the information from the Alpha tests to make final adjustments to the game. The resulting version of the game is called the Beta, and it represents finished game the closest. This version is often released for public for testing the game and to find the more well-hidden bugs before the release. Nowadays it is common practice - especially on computers - to release the game as Early-Access, meaning that customers can play a development version of a game before the full release, and developers get more information about bugs and glitches and can fix them, and possible ideas for new functions and improvements.

After the game has been released it enters the Maintenance phase. In this phase the developers await response from consumers who have played the game in case of unforeseen factors, such as bugs and glitches or game mechanics that don't work as intended and prepare to work on a patch to fix them to improve the game experience. In addition, maintenance periods, scheduled shut-downs of servers that regulate the game or allow for online play, can be used - especially in online multiplayer games – to prepare the game for coming updates. (Wiltshire 2018, cited 26.2.2019).

4 PRE-PRODUCTION OF “CORRUPTED JOHN”

This chapter of the thesis is about the case project. As it was mentioned before, the thesis will not cover the whole process of the development of the game but only the Pre-Production Stage.

The chapter is divided into two parts. In the first part there is a complete description of a game design for the game with the mentioning of necessary features. It grasps the main points of the pre-production stage of game development and includes some additional information. As a base for the first section, the combination of several game design document templates were used. Some points as Competition, Monetization, User Interface and Tools should not be considered 100% correct and will depend on the Super God Ltd decision.

Second section is the possible prototype of 20 levels for the game so it could be showed to the audience and then continued or not according to their feedback. The levels are created to be played for at least couple of minutes to get the player interested so they would play the game on the next day. The graphics are used from the original idea of Super God Ltd and there are no problems with the copyright in this case.

It is important to note that all the concepts of game design and level prototypes are not final but only in pre-testing stage. The final product may possibly be different depending on Super God Ltd specifics.

4.1 Game Design Concept and Features

This section contains both brief and full versions of the game design. The brief version introduces the reader to the main information about the game while the full one is a more detailed variation and covers up a lot of different concepts. The foundation for all the ideas documented are based on the previous information about the game from Super God Ltd. This case project consists of mostly author’s ideas which were developed upon the original features.

4.1.1 Brief Game Description

Working title - **“Corrupted John”**.

Current Status – In design process and paper prototyping.

Concept Statement – The game is about the adventures of John whose heart, body and soul were taken from him by rulers of the Void, Earth and Light realms. It is a quick pick-up game where player can control only John in his quest. The basic gameplay is the combination of Tower Defense, Arcade, Action-Adventure with Logical Puzzles. The thing that makes the game fun is the variety of gameplay easily playable in short sessions with the follow up story for the character.

4.1.2 Game World and Story

Background and story

The story is about the John “The Eagle Eye”. He was the greatest archer Earth Realm ever saw. It begins with the revolt of commoners under the leadership of Londorf to overthrow the current emperor of the Earth Realm. John being the best archer of the realm was serving the current emperor, Dailif “The Insane”, as a member of his Royal Guard but was unhappy with how the emperor was dealing with all the problems of the Empire, resulting to Dailif getting his nickname. Dailif was always suspicious of the Void and Light and their true intentions on humanity so he decided to strengthen his army with methods what were quite strict and sometimes cruel.

After several years of Londorf revolt, the whole Empire was divided into two camps. The ones who fought for Dailif and the other for Londorf. John decided to join the Londorf’s side and left the court during one of the nights. With such a great archer on his side, Londorf managed to win many battles and finally began sieging the Emperor’s citadel itself. Dailif, seeing that he has no way to win this civil war decided to stop the further bloodshed and surrendered. He invited Dailif to his citadel for feast with negotiations about peace. Londorf took John and several other men with him as bodyguards.

When they entered the citadel, they saw sick and starving soldiers who were tired of this war so they didn’t expect any aggression. During the feast the Emperor surrendered and made Londorf the new Emperor of the Earth Realm. When everyone in the feast hall started to cheer and drink for the ending of civil war, one of the Londorf’s men fell on the floor completely cold and drained.

This incident was seen as an attempt to poison the guest so Londorf instantly took out his sword and landed a fatal blow on the Dailif killing him without any remorse.

After coronation, Londorf received the title "Righteous" for his deeds and promoted John to be the leader of Royal Guard. Life was peaceful after all these years until recently, commoners started to disappear without a trace. Henceforth John was given a new task, to find out what caused such disappearances and why. During one of his usual patrols around the castle court he saw a secret wall door closing almost right in front of him in one of the castle walls. After inspecting it, he managed to find a way to open it. In the end of the long hall way he heard some voices behind a door. He opened the door and saw a figure who was talking to the rulers of Void and Light.

John's presence wasn't unnoticed, and the Lord of Shadow pointed at the door straight at the John. The figure turned around and his lifeless eyes John recognized Londorf himself. In one moment, there was darkness.

John was buried without public notice. Only one person, Skjagga the Necromancer, knew where his grave is. He was brought back to life, or at least the skeleton that was left from his former self. This is where his adventures start.

Plot

- The game is linear and follows one narrative where John has to retrieve his body, soul and heart back to bring justice and become himself again.
- His body is in the Earth Realm, Soul in the Void and Heart is in the Light.
- There is an additional secret narrative about the character who resurrected John.

4.1.3 Gameplay and Mechanics

Game Progression

- Game begins with the tutorial where players is taught about the basic mechanics of shooting. Levels of the tutorial will increase in difficulty successively but not becoming too hard.
- All three realms have 30 levels each and each 10th level has a boss. Last levels of each realm have the main boss of that realm.

- Levels vary in certain gameplay mechanics. Some require defending player's position from enemies closing in, others require logical solution to a certain puzzle, transitions between levels (f.ex. Player stands on a cart\boat while it moves forward and shoots arrows at enemies pursuing the player or attacking from the front.) and player attacking sequences (f.ex. Storming of a fort or a castle using their own troops).

Objectives

- The final goal of the game is for John to find all three of his parts: body, heart and soul.
- Players must complete all the objectives on the level to continue. Most of the time the main objective is to defeat all the enemies.
- There is a rating of 3 stars for each level. Conditions of getting 3 stars are varying and depend on the type of gameplay of a chosen level. If the player wants to receive the maximum reward, then they have to get all 3 stars.
- Additional quests can be completed during the certain level so they player could receive additional rewards.
- Players can replay levels as much as they want.

General Game Mechanics

Players cannot control their character's movement and only allowed to target their bow in a similar way it is done in games like "CastleStorm" (figure 12) and "Angry Birds" (figure 13).



FIGURE 12. CastleStorm Gameplay (Venter 5.10.2013, cited 28.01.2019)



FIGURE 13. Angry Birds Gameplay (Thurana 7.09.2011, cited 28.01.2019)

Players can also use abilities and different types of arrows to overcome obstacles and achieve goals.

Game Mechanics of each type of level

Levels in this game are divided to several types:

- Defense of a base
- Logical Puzzles
- Siege of a base
- Boss Battles (Mini Bosses)
- Realm Boss Battles (Main Bosses)
- Unlimited play
- Transition between some levels\Realms.

All the levels keep the general mechanics but add on to the gameplay with different features.

Defense of a base demands from the player to defend his position from the waves of enemies coming after each other. Main goal for the player is to not let the enemy breach the gates of player's base. Player is allowed to use most of the abilities that are available with the exception of some that are not suitable for such type of the level. Players are also able to build towers on the walls to

help in the defense. The basic gameplay is similar to games in tower defense genre as an approximate example - "CastleStorm" (figure 14).



FIGURE 14. CastleStorm VR Gameplay (Sammy Barker 1.08.2017, cited 28.01.2019)

Logical Puzzle levels will require some logical thinking from the players. Those will be mostly in the sense of "Angry Birds". Players will have to shoot arrows and using physics to accomplish a task. As examples of such levels there could be something similar to finding out how to lower a bridge to cross a river or to sabotage the enemy's provision\resources. In case of lowering the bridge, the player will have to cut the rope which will be placed on the other side of a gate wall. To accomplish this task, they will have to use different objects of the environment on the level. Players are not allowed to use abilities on such levels as it would cause rapid skipping through the levels, but it is possible to use hints with the sacrifice of points\stars or different consumables to help with the completion of a level.

Siege of the enemy base is the opposite of the defense. The player is able to use full range of abilities that are available but also the main emphasis of these levels is on the creation of player units. On the left side of the game view there is player's camp from where he\she can send units to attack the enemy, shoot enemy units with a bow and to use siege weapons as abilities to help player's minions to breach the gate and destroy the castle. It is important to note that the AI player (the enemy) is also creating units and able to use abilities so the end picture is Castle vs. Castle action.

Boss Battles combine all the levels above. They start from the defense, then small logical puzzle and in the end the besieging of the enemy. The enemy castle in this level has 3 layers of gates and after 3rd one the player's task changes from destroying the castle to defeating the enemy boss who slowly will be walking towards the player as a last charge.

Realm Boss Battles are unique in the end of the level. They are mostly the same as general Boss Battle levels but after defeating the enemy castle the main boss appears and attacks the player's sieging camp. The players have to use everything they learned during the previous levels but also find out the special mechanics of certain bosses. Players can just shoot the boss to defeat him but it can take a lot more time and micromanagement than using some environment. Main Bosses will have 3 stages of the battle and during each stage there is a certain mechanic that can be used to defeat them faster. During this phase of a level the player has 3 hearts as his health and also the health that their gate has.

As an example of such level and its mechanics there is a final stage of a battle against the Earth Realm Emperor: During the first stage, the Emperor has an armor on him and is spawning units to attack the player. When player defeats all his troops with their own units or using the bow the boss goes into vulnerability state when the player can either spam the shooting of arrows, use abilities or to shoot down catapult's shells\rocks flying above the boss to crack open his armor. After the armor was broken, the boss goes into stage 2 where he is also using his magic to attack the player but also protects himself with the magical field. Player has to deflect the fireballs with his arrows so they would fly back to destroy the shield and then shoot the boss, or he deflects fireballs into random ways and shoot the field with arrows instead. When some of the boss's health is depleted, he goes into stage 3 and turns in to a scary looking creature. Both boss and the player cannot call units anymore. The boss is always vulnerable and shoots void or light bolts into the player which he has to deflect with arrows to stay alive. After some time, he starts to cast the biggest magic he has at his disposal and the player can shoot him directly during this time. If the player doesn't kill the boss when he is casting this magic, then the boss finishes casting the magic and sends unavoidable ball of light and void into the player hurting him with 1 heart. After the boss is defeated, the level is finished.

Unlimited play -game mode is an additional gameplay feature available for players which is not connected to the main story. It combines defense of a base and defense of a base types of levels and is available to play infinite times. This game mode will be good for players who can't complete certain levels of the main story so they could play this mode and grind coins for upgrades. Style of

levels will depend on where the players are stuck in the story. For example, if players are still in Earth Realm then the battle will be in the Earth Realm style. If players completed Earth Realm and are in the Void Realm in the story, then the style will be chosen randomly between those two. Players can also choose the difficulty level and the Rewards will depend on it. The AI can use various abilities from the pool of all abilities available in the game.

Transition levels are additional level between each realm or level. Depending on what was the last level completed the player has to do the transition stage. It can be a boat for crossing the river, flying through the well of souls on the void ship with the skeleton captain to the Void Realm and going up to the skies in the pillar of light to the Light Realm. Player cannot move by himself by is standing on a boat\ship\levitating on this stage which moves with him. The player has 3 hearts of health and has to defend himself from the enemies attacking him from all sides of the screen.

Character Abilities

Player can use variety of abilities during the playthrough. These abilities will vary in availability in some level types to fit the needs of the level and balance out the gameplay so it wouldn't be too easy or too hard for the player to complete it. Each ability has cooldown after its use and it can be decreased by leveling them up when player is not playing any level and is in his camp\town\castle. Abilities are divided to several types:

- Active
- Hold and Release
- One tap

Active abilities are the ones that can be activated to improve certain characteristics, damage of a player or to active various types of arrows.

Hold and Release abilities consist of different interactive elements. The player needs to tap on ability's icon and then while holding the finger on the screen he must move it to the desired location and then release it after this action, the ability will be used where the player set it on.

Examples of abilities can be:

- "Sharpened Arrows". Player can use sharpened arrows for a limited time which deal critical damage on enemy troops. Can be used in every level type except Logical Puzzles. It is an active ability. Can be upgraded to last longer and deal more damage.

- “Arrow Storm”. Player sends the volley of arrows into the air covering a small area on the battlefield and damages all enemies that happen to be inside of that area. Can be used in every level type except Transitions and Logical Puzzles. Hold and Release Type. Can be upgraded to increase the area and to deal more damage.
- “Duty Calls”. Player uses his influence among his people and calls for a quick aid against enemies. This ability creates several basic warriors which power depends on the level of player’s warriors. Can be used in every level type except Transitions and Logic Puzzles. Can be upgraded to create more units.

Equipment

Player can upgrade a big variety of abilities, units, buildings and gear. After completing a level, the player receives a reward according to his score and how many stars he received. He can use the reward for upgrades to be able to complete next levels and to keep up with the enemy levels. Upgrades can be done several times and each upgrade level requires more coins than the previous one.

Each upgrade of abilities improves them by giving small additions to main focuses of those abilities. Upgrade of units changes their looks a little bit and gives improvement in health, armor and damage of those units also opening new types of units. Building’s upgrades decrease the amount of coins required for upgrades, improves the towers the player can build and opening new ones. By upgrading gear, the player develops his character.

Player equipment that can be upgraded includes:

- Bow. Can be upgraded to shoot faster and deal more damage.
- Arrows. Upgraded to increase the damage and flying speed of different types of arrows.
- Armor. Upgraded to improve the sustainability of the player by increasing his health during boss battles and transitions.
- Quiver. Can be upgraded to speed up the shooting of arrows and increasing the maximum amount of special arrows.

There are different types of arrows that can also be upgraded separately. Some of them are:

- Fire Arrows. Ignite enemies burning them for a limited time.
- Light Arrows. Deal more damage to Void units.

- Void Arrows. Deal more damage to Light units.
- Frost Arrows. Freezes enemies for a certain time.
- Stunning Arrows. Stuns enemies in place for a short time.
- Triple Arrows. Splits into 3 normal arrows during the flight.
- Explosive Arrows. Explodes when hitting the enemy. Pushes them back and damaging.
- Lightning Arrows. Hits the enemy with the lighting and also spreading it to other nearby enemies.

Some of the Buildings available for a player:

- Fletcher's Hut. The player can upgrade his bow, quiver and arrows here.
- Armory. Armor and units' weapons and armor are upgraded here.
- Barracks. Player's units are upgraded here.
- Masonry. Upgrades the health of a Gate and improves towers.
- Farmstead. Upgrades the amount of food that is produced for creating units on the battlefield.
- Marshal's headquarters. Upgrades abilities.
- Shipyard. Upgrades the ship during transition stages.

Additional Quests

If players would like to have more rewards and be able to get upgrades faster, they can complete additional quest/orders. They can be completed on any level according to the required level type of the order. These orders will reward players with additional coins and possibly cosmetics. They will vary in difficulty it will not be too easy for players to do them.

Examples of such quests:

- Kill 25 enemies of warrior type.
- Hold the center of battlefield for 2 minutes.
- Destroy enemy boss without letting him deal damage to your gates.

Losing

Players can lose the game if they fail to defend their main castle or themselves. When castle's or player's health reaches 0, the player fails the level and must start again from the beginning of the

level. The default health will be determined in the future design but as for now it is 100 for castle and 3 for the Player. It can be increased with the upgrades and buffs. Players can also lose Logical Puzzles if they will not be careful where they shoot and will be discovered by the enemies.

Gameplay Loop

The core loop of this game is quite simple (figure 15). and based on it there is a more in-depth gameplay loop (figure 16). These are not final and can be expanded upon but were made to give basic understanding of the gameplay flow.

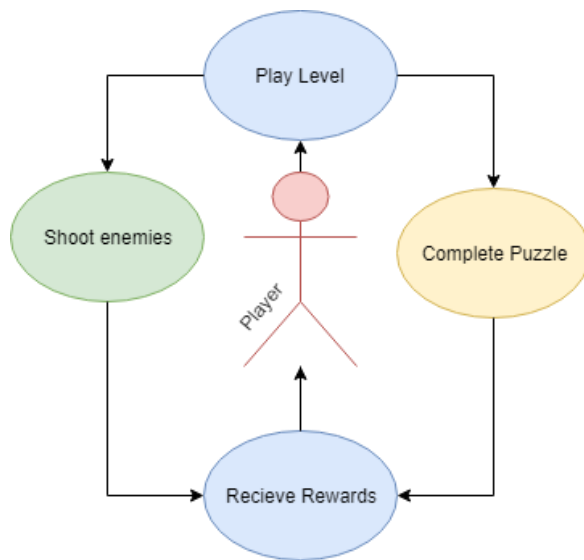


FIGURE 15. Core Loop

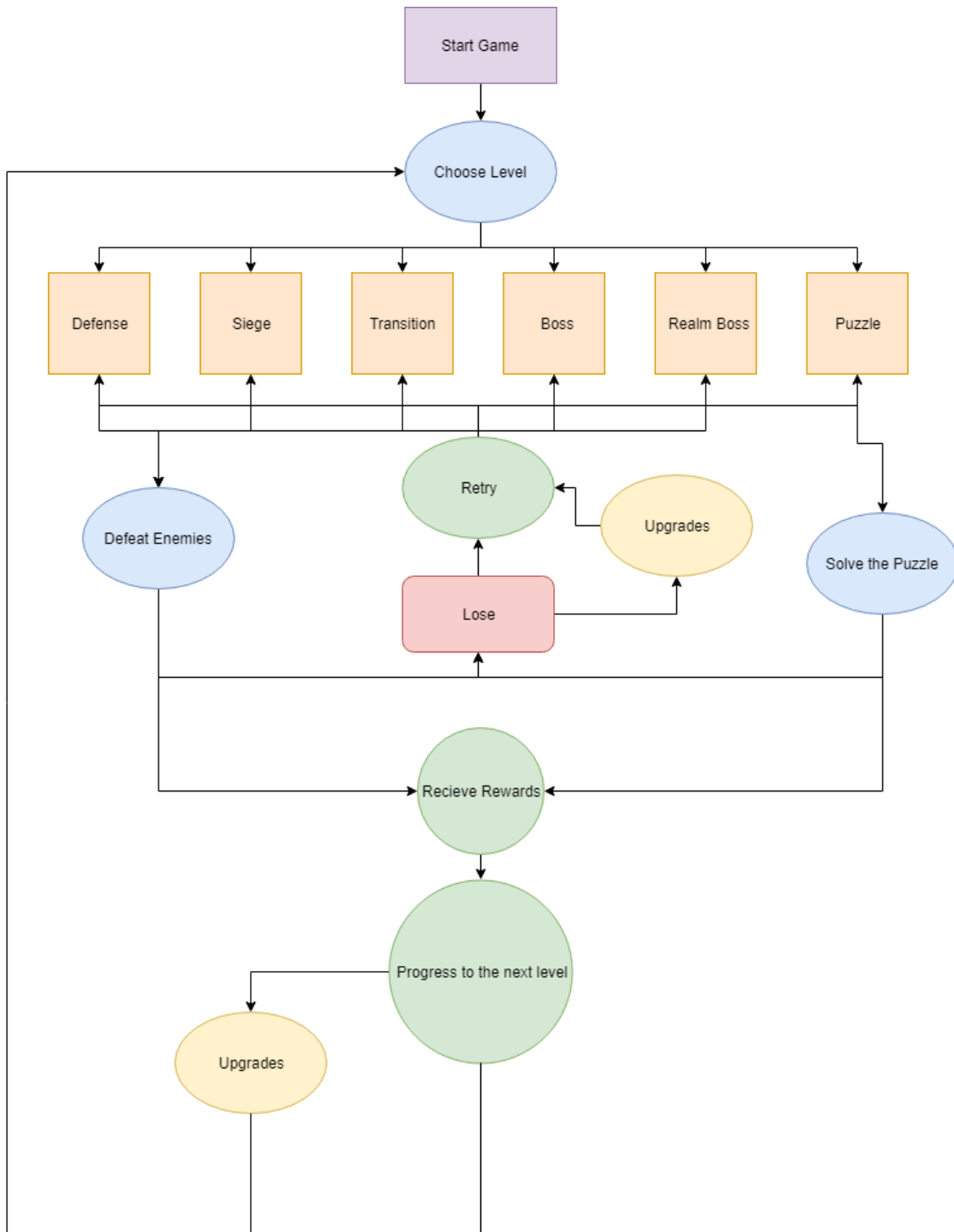


FIGURE 16. Gameplay Loop

4.1.4 Non-Player Characters

Non-player characters are not usable by the player. They consist of units spawnable by both the player and AI, bosses and some characters that are present to push the story forward. Also, there are several NPCs who act mostly as a background. For example, the blacksmith in the armory who sells upgrades to the player.

Each realm has unique looking units and buildings to fit the overall style of that realm. The player will be introduced with all types of units he can use during the progress in the Earth Realm. There will be 2 more classes of units in both Void Realm and Light Realm.

Units are divided to several main classes that are common between the player and AI:

- Warrior
- Archer
- Pikeman
- Horseman
- Assassin
- Mage

These classes work in the way of a cycle where one has some advantages towards the other (figure 17).

Each type of unit has their own special skills and styles of defeating the enemies.

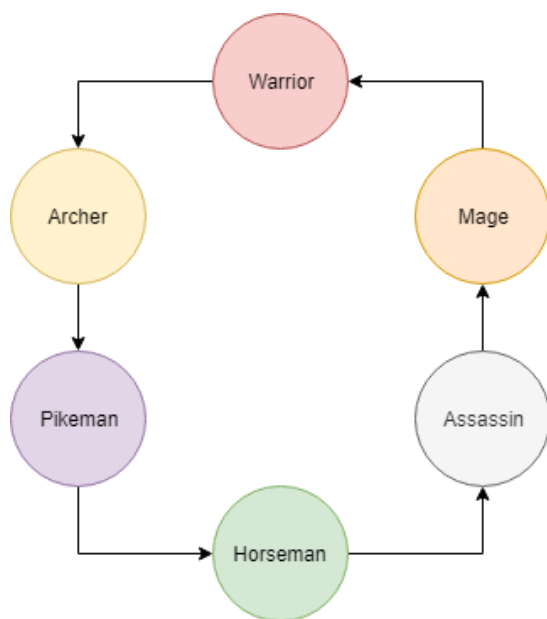


FIGURE 17. Cycle of Classes

Earth Realm

In this realm both AI and Player have the same looking units with the classes listed above. The player will be introduced to all the unit types before the first mini boss fight at level 10.

After defeating the main boss of the Realm, the player goes to the Void Realm by using the boat specifically designed to cross “The River of Souls”.

Void Realm

After several levels the players are introduced with the new classes of units:

- Inquisitor
- Paladin

In this case, AI has 2 other units which work differently to the player's ones:

- Shadow Priest
- Soul Ripper

All 4 classes look differently and also only good against each other making their own cycle of classes (figure 18).

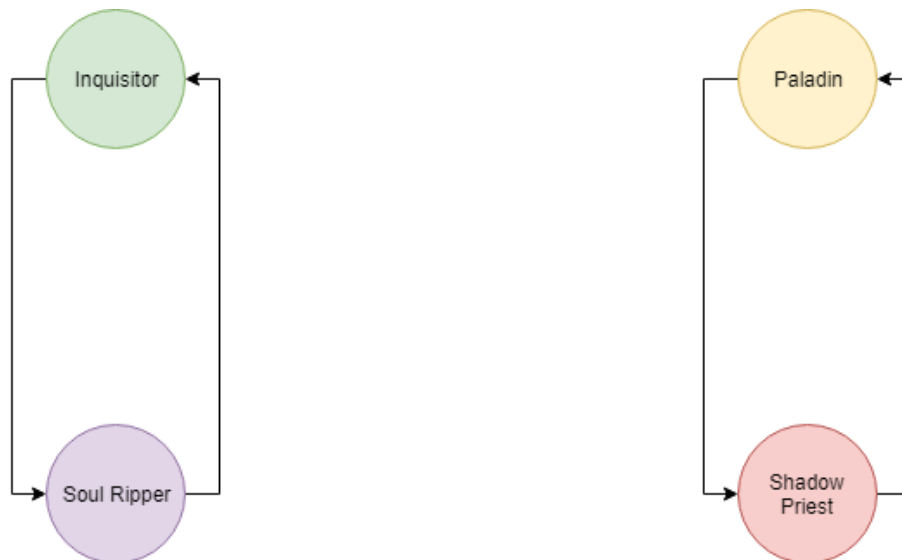


FIGURE 18. Void Realm Classes Cycle

It means that they are more useful against each other but still can be spawned against other classes but will be less useful.

After defeating the Void Boss players will transition to the Light Real by again using their boat upgraded into a flying ship to fly up into the skies.

Light Realm

Just as with the Void Realm, Light Realm introduces 2 more classes but also keeping the previous ones:

- Warlock
- Mirror Knight

Light Realm AI receives:

- Pyromancer
- Overseer

They also have their own cycles just as with the Void Realm Classes (figure 19).

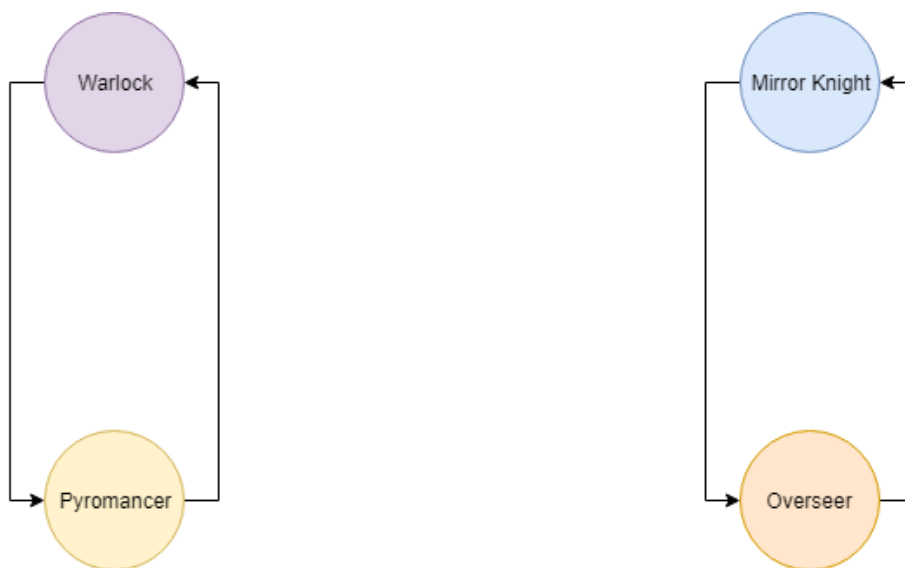


FIGURE 19. Light Realm Classes Cycle

When the last boss is defeated the story ends and the player has won the whole game.

Mini-Bosses

Mini-Bosses are the bosses that are present in every 10th and 20th level of each Realm. They act as generals of the Realm's armies and bodyguards of the main Boss. They have their own unique look and play important roles in the main story. The battles against mini bosses should be easier than main bosses but still hard enough for the player.

Main Bosses

Main Bosses are present in the 30th level of each Realm and has unique appearance and special game mode specifically for them. These are the hardest enemies to defeat and play main roles in the story.

4.1.5 Game Levels and Art Style

This section tries to explain the general looks of the game. Art style will be completely different, but the pictures should give the basic understanding of how the game will look like.

Earth Realm

This Realm will have the basic medieval fantasy atmosphere to fit the human like medieval style of life but bringing the unnatural constructions of the fantasy (figure 20.)



FIGURE 20. Medieval Village (Ahn, J. 2013, cited 01.02.2019)

Void Realm

Void Realm will have the dark style of the world with unnatural shapes and shapeshifting creatures. It will have the feeling of broken time and space with the mix of souls, ghosts and shadows (figure 21 and figure 22).



FIGURE 21. Void World World of Warcraft (Blizzard Entertainment, cited 02.02.2019)



FIGURE 22. Void World World of Warcraft (Blizzard Entertainment, cited 02.02.2019)

Light Realm

Light Realm is the opposite of the Void. Instead of darkness there is a very light atmosphere. It is built on a clean energy so there are a lot of unnatural to human nature structures and the overall appearance resembles “Godlike” feeling. Creatures are also made of energy and can shapeshift instead of consistent appearance (figure 23).



FIGURE 23. Silver City Diablo 3 (Blizzard Entertainment, cited 02.02.2019)

4.1.6 Technical Description

General Art Style

The game will be in a cartoonish/pixel art style in a 2D perspective.

Sound design

Each Realm will have specific background music suited to the overall theme of the Realm itself. Other than that, sound design will be decided by the Super God Ltd.

Platform

Main focus will be on a mobile market, but it is quite possible that the PC will be taken into consideration later.

Tools

Quite possibly that “GameMaker Studio” will be used as main engine for this game but it is completely up to Super God Ltd. For the map design we will be using Tiled MapEditor.

4.1.7 Marketing & Target Audience

Demographics

The main target group for this game are people from 15 and older who enjoy:

- Linear story driven 2D action-adventure
- Tower Defense\Survival

Monetization

This subsection will be decided by Super God Ltd. But in the authors' minds this game should have Freemium monetization model to get the most profit from the game and be able to improve it further.

4.1.8 Other Ideas

There are quite many possibilities for this game in the post-production stage:

- Introduction of Multiplayer
- Various cosmetics
- Continuation of the Story (Example, Death Realm and introduction of the new enemy)

4.2 Level Design

This section tells about level design in general and the work done towards the thesis game's level design.

Level design is an integral part of game development and an important factor in forming an engaging gaming experience. One of the reasons games are played, as well as movies are watched and books are read, is their ability to allow the player to 'escape' the real life and to immerse themselves into the game they are playing. If the level fails to accomplish this, the whole game can suffer greatly as a result (GameDesigning.org 2018, cited 27.3.2019.)

4.2.1 Realm 0 – 'Tutorial 'Realm''

This 'realm' is purely for teaching players the basics of the game. As the game has such a large amount of different gameplay mechanics which all cannot be taught in a single level, more than one level is required to get players acquainted with the game. This realm also serves to tell the player the story about the main character. During the whole game Skjagga will serve as a guide to a player, explaining mechanics and being a sort of story teller.

Tutorial 'realm' is part of the Earth Realm, henceforth it features the Earth Realm's atmosphere as described in chapter 4.1.5, although from a bit more rural point of view.

- **LEVEL 0-1 – 'Basics Tutorial'**

This level teaches the player how to shoot with their bows. As this is the players' first time with the game's controls the level requirements are very easy to fulfill.

The level consists of target practice for the player character John, a small trial to remember their skills at archery. John is given targets to shoot at, topples towers and cuts ropes with his bow. Before he gets to try out special arrows and the siege weaponry, John and Skjagga come under attack by Dummy the Scarred, and are forced to retreat to their castle, ending the level.

Dummy is a graveyard watcher but also a mayor of nearby village who received his nickname for being not the smartest tool in a shed and got to his position just because he has relatives in the high-ups. He saw Skjagga and followed him all day to the John's graveyard. After seeing

that John was resurrected by a skeleton, he ran back to the village and raised a good number of peasants and came back.

- **LEVEL 0-2 – ‘First Defense’**

This level features the first Base Defense of the game. The player is guided with the features of this mode and faces a few enemy units to get acquainted with both their and John’s skills and advantages.

After completing their retreat, John prepares to help with defense of a camp against Dummy the Scarred and his attacking force. Enemy attack begins with two warrior-type enemies, in this case starting level warrior peasants, coming in turns to be shot at with normal arrows. Next enemy is an upgraded warrior-peasant with a better weaponry and armor including a basic low-quality iron sword with a shield and a leather armor, and player is given their first special arrow, the Frost Arrow, to slow them down and finish them off with normal arrows. Next up is a group of three warriors, against whom the player is instructed to use the Arrow Storm to defeat them. The final enemy that arrives during this training phase of the fight is an archer, who fires at the camp’s gate, leading to Skjagga explaining that when the gates or walls are destroyed the player is defeated.

After the ‘tutorial phase’, Dummy sends in most of his attacking force consisting of five warriors, one three-warrior group, two horsemen and two archers in turns. These units, instead of the previous units that stop in the battlefield to serve as training targets, attack the gates as they would in the rest of the Defense levels, apart from being easier to defeat thanks to lesser health and them coming in turns. After defeating each enemy Dummy declares a retreat and the level is won.

- **LEVEL 0-3 – ‘First Puzzle’**

This level introduces the first puzzle of the game.

Determined to counter-attack Dummy’s castle before he can muster stronger forces, leader of the camp leads John to an old vault that contains the siege equipment required for the attack, and around which the camp is built. The door is locked, however, and the player needs to find a key hidden by a fellow famous archer, Alexander, to open it.

Alexander was the closest friend of John. After Dailif was defeated he disappeared without a trace. John tried to find him but all he could find was his bow, broken in half and left in the cellars of the Earth Realm Emperor's palace.

Level starts after the characters try to find a key by eyesight, but to no avail. A wind starts to blow, which attempts to grab onto the several sheets of fabric covering structures under them. This also reveals the ropes they are fastened into, which look just like the ropes that were cut in the first training level. It's in this moment that player is taught about their ability Eagle Eye, which reveals puzzle-relevant points of interest but lessens the reward gained from completion of the level. Ropes are highlighted with this ability and cutting them will release the sheets to reveal the structures underneath, which are very crudely built and almost falling apart, and the key hanging from a thin rope some four meters above John. Rope is too thin to cut, so he needs to bring down the structure by shooting a heavy arrow at a weak wooden beam. Structure comes down one floor at a time, each floor demanding a slightly more accurate shot, until the key becomes reachable and level is complete.

- **LEVEL 0-4 – 'First Siege'**

Player is challenged to a Castle Vs Castle battle for a first time. As with the Base Defense, the player is guided through the gameplay process. They also get to try out basic units and learn about their effectiveness.

Level begins with John's allies and Dummy the Scarred deploying their siege machines into full castles and ask John to take station on an archer tower near the wall to provide cover fire and direct the offense. Dummy threatens John's crew before leaving to prepare for battle.

Player learns how to deploy allied units from their castle and use John's abilities to take down enemy units to help his allies advance to enemy castle and damage it. Player gets to use different units and gets to know their strengths and weaknesses. After the pre-determined units have been defeated, the enemy castle starts to spawn units and use abilities like in normal levels but has less health than normal and spawns less units due to this level being a tutorial level.

Upon destruction of enemy castle Dummy, after threatening to bring in the Earth Realm's Emperor's armies by using his contacts in the high-ups, retreats once more in his war wagon. John's crew acknowledges that they are no match for the great army, but thanks to Skjagga's

knowledge of the area, they figure out a plan to ambush Dummy by using a shortcut through a nearby cave before he escapes. The level ends upon entering the cave.

- **LEVEL 0-5 – ‘First Boss: Dummy the Scarred’s War Wagon’**

This level is the first boss battle of the game. It resembles a mini-boss level more than a realm boss. Being the last tutorial level, it is also more reminiscent of the difficulty of the rest of the game, but still slightly easier than normal levels.

After getting caught between roadblock and John’s allies, Dummy the Scarred unpacks his war wagon to reveal a large ballista and points it at the roadblock. Battle’s win condition is to cause enough damage to the ballista so it destroys itself via misfire before it can open the way for Dummy to escape.

Level resembles a Siege level, in that the player sends their units to break down the ballista, a bit like breaking down castle’s gates. Dummy’s wagon, unlike the normal enemy castles in Siege mode, doesn’t spawn units, but it will fire upon player’s units and use abilities like a normal castle. For this reason, some of the player’s unit-destroying abilities, like the Arrow Storm, are disabled. Player has a time limit under which to destroy the ballista, but the amount of time is quite plentiful.

After successfully reducing the ballista’s health to zero, Dummy tries to hurry the shot, resulting in the ballista destroying itself and leaving Dummy without escape. John imprisons him, and the level ends.

4.2.2 Realm 1 – ‘Earth Realm’

- **LEVEL 1-1 – ‘Puzzle: Bad Dog’**

Taking place in the end of the realm, this level is the fifth-to-last level of the realm.

John and his crew, after the disappointing yet very lore-revealing raid to the imperial palace and much searching across the realm, have finally determined the holding place of his body in the great fortress of Pathwood, the capital of Earth Realm. Castle consists of both outer and

inner walls and is heavily reinforced, so they cannot attack it head-on. Instead, John volunteers to infiltrate the castle to cause havoc and distract the enemy before his crew attacks the outer walls. Before that, however, he needs to get through the courtyard guarded by three dogs, each of which needs to be distracted before he can access the inner walls. The level is separated in three parts, one for each dog to distract.

- **LEVEL 1-2 – ‘Puzzle: Guerrilla Skeleton’**

After having successfully entered the fortress, John prepares to halt the enemy forces to give his companions an edge in their assault. Yard between inner and outer walls of the castle is littered with explosives, weak structures and other hazards John can use to cause as much damage to the enemy as possible. Alternatively, he can use his newly-acquired Explosive Arrows for the first time.

The level’s puzzle element is in maximizing the damage dealt to the advancing enemy units. Unit deployment starts with basic level units, eventually progressing to higher-level units. Lower level units fall easiest with normal arrows, but Explosive Arrows need to be used to push back stronger units, and the Freeze/Stun Arrows to group the enemy units near the level hazards. Success of the level depends on player’s capability to eliminate every unit before they can get to the other end of the screen. Level is failed if enough units make it to the end and is won when all the enemy units are expended without surpassing the limit of units-let-through.

After the level is won, John is found out but makes his escape through a use of a zipline arrow stolen from the same storage as the Explosive Arrows. Meanwhile, John’s crew breaks down the outer walls, and John joins the assault on the inner wall, ending the level.

- **LEVEL 1-3 – ‘Siege: Break the Gates’**

With the castle’s defenders in disorder thanks to John’s successful sabotage and the defending soldiers struggling to deploy and repel the attack, John and his crew prepare to attack the inner walls. This level features mostly medium-level units and an occasional high-level unit, and a quite sturdy enemy castle fitting for the last ‘standard’ level. The example of such level can be seen in figure 24.



FIGURE 24. The example map of a siege level

After destroying the castle, the remaining enemy forces are forced to retreat inside the fortress. John and Skjagga lead the offense forwards, and the level ends.

- **LEVEL 1-4 – ‘Mini-boss: General Ulif’**

Skjagga leads the crew inside the keep, but John starts to feel that something is off, for their advance is surprisingly easy as they hardly face resistance. His suspicions are confirmed as the keep’s doors are locked behind them and they are surrounded in the keep’s hall by elite units, most of them assassins. One of assassins steps forward, introducing himself as General Ulif.

Ulif is the closest friend, the general of the whole Earth Realm and a personal advisor of Londorf. He was taking the same position in the past when Dailif was still ruling the Empire. He was one of many traitors who betrayed Dailif. With the help of Ulif, many soldiers joined the army of Londorf during the war. Ulif is not a simple traitor. He is smart, unpredictable, opportunistic and cunning. This all together creates the best spy or assassin but unfortunately, not the best general, something that he himself acknowledges as well.

Ulif declares that Londorf will be beyond John’s grasp as long as he lives, and blends to the group of elite assassins who then vanish to the shadows. The level then starts.

Level resembles a Defense type level in that the John must defend himself and his allies against the Ulif’s troops. Enemy units consist of medium and high-level units deployed for as long as Ulif has health left. In addition, a group of four assassins is deployed regularly. Ulif is hidden among this group, and when he’s hit three times, the group disperses and Ulif takes damage. Other assassins function similarly to Ulif and can take three hits before being

defeated. All the while attack will intensify, so the player needs to defeat Ulif before the enemy units overwhelm them.

After successfully reducing Ulif's health to zero, he collapses on the floor, and his units retreat to reinforce Londorf. He warns John that Londorf will be his and his friends' doom and passes out due to his wounds. John begins to give chase to the retreating troops, ending the level.

- **LEVEL 1-5 – 'Earth Realm's Realm Boss: Emperor Londorf the Righteous'**

The fight itself is described in chapter 4.1.3.

4.2.3 Realm 2 – 'Void Realm'

- **LEVEL 2-1 – 'Transition between Realms: Welcome to the Shadowlands'**

After defeating the Emperor, John got back his body showing everyone that he was an actual John and proving that Londorf was corrupt. Being reinforced by the new recruits and having the support of the large army of the Earth Realm, he begins his preparations to travel across the dark shadowy waters into the Void.

After his ship was upgraded to handle the untamed waters, he took off to the Void Realm, but they were expected to arrive as the Lord of the Void, Kruu'Tix, already heard about the defeat of Londorf. As they entered the void realm John's ship as attack by different dark creatures which represented a great danger to his crew and plans in general.

John has to use his bow to defend the ship and his crew from the enemy units. He has to reach the shores before his ship will be destroyed.

- **LEVEL 2-2 – 'Defense of the Base: Unexpected meeting'**

John and his crew successfully reached the shores and started building their camp. John and Skjagga started to plan their next move and were trying to find out where John's heart is located but they knew something was off as it was too quiet considering that Lord of the Shadow already knew about John's invasion.

In this exact moment, loud echoed sound of horns signaled about the attack on the John's camp. This shore was an ambush all along and they didn't have enough time to prepare for the defense. John has to defend his camp to beat back the enemy's onslaught.

John will have to defeat several waves of enemies different in difficulty and sizes. Only this way he will be able to reinforce his standing in the Void lands. After the defeat of the enemy forces, the Lord of the Shadow appears calling out John to meet with his personal bodyguard on the battlefield to be worthy enough to meet him personally, of course John will be able to find a way to him.

- **LEVEL 2-3 – ‘Puzzle: Shapeshifting Labyrinth’**

Now John knows what to do but how to get there is another hard question. Void Realm is an infinite place of empty space and shapeshifting structures and it would take centuries to find the right place to go but there should be a way to find a right path to their goal faster.

John will have to solve a puzzle where he must use the light, mirrors, portals and his bow to change the shapes of walls to make an open path as the void reacts to the light as a guide through the darkness.

After opening the way to the capital of the Void Realm, Throne of the Darkness, a massive pillar looking structure which always moving, he sees the large enemy base representing the whole void army ready for an attack.

- **LEVEL 2-4 – ‘Void Realm’s General: Lar’tharox’**

John uses his siege machine to deploy a castle and start an assault to the enemy’s positions. This is a main base of the bodyguard and a general of the Kruu’tix, Lar’tharox. It is important to win this battle for John to reach the ruler of the Void Realm and claim his heart back. It won’t be an easy fight as the enemy forces are quite strong and have skilled soldiers.

John has to use his upgraded castle defenses and units to attack the enemy castle, breach the castle’s walls and destroy the main barracks to defeat the enemy. When the castle will fall, the enemy general will personally start attacking John. He has to defeat him before he manages to destroy John’s castle.

After the general’s defeat, John finds a Void key with the inscription of “The who wields this key is able to see through the madness of the Void” and there is nothing else standing between John and the capital city anymore.

- **LEVEL 2-5 – ‘Void Realm’s Realm Boss: Kruu’tix, Lord of the Shadow’**

Throne of Darkness has the large outer wall with no gate in it. This is where John uses the key, he got to open a path to the capital city. After entering through the wall, he hears the voice of the Lord of the Shadow, welcoming him and saying that this is the last time they meet.

John builds up his castle again and has to defeat waves of enemies coming from the inside of the Pillar (main building in the center of the city). After that, he will have to lay siege and attack the Pillar with his forces destroying 3 gates and reaching the Heart of the Void. After destroying it the Kruu’tix appears and attacks John.

He will have to defeat him in personal battle using his bow. Kruu’tix has 3 phases and during each of them becomes more dangerous by overflowing with the power of the Void from the Heart.

After John defeats Kruu’tix he receives back his heart increasing his reflexes and overall power and now his way lies to the Light Realm.

4.2.4 Realm 3 – ‘Light Realm’

- **LEVEL 3-1 – ‘Transition between Realms: To the Skies!’**

John knew that his soul was imprisoned by the creatures of the light as an example of purity. His way lies to the skies but for that he needs a much better ship than before.

Upgraded with silk wings and steam engines John and his crew embarks on their last journey. Journey to finally take his revenge and do justice. In the light realm, everything what light touches is connected into one web. Nothing can be hidden from the all-seeing Queen of the Mirrors, Lashandra.

Just as they entered the clouds, the queen felt it and started the massive storm taking all the light away from the crew. Massive waves of light soldiers rushed in to defend their borders and prevent John from reaching his goal.

John, again, has to fight his way through the waves of enemies and keep his ship safe until the end of the route. In this level, the ship is also could be damaged by the lightning and includes the special mechanic. As all the light was taken to prevent John from easily finding his way to the right place, all the light realm soldiers are being hidden in the darkness when approaching the ship. They can be seen by controlling the special lamp at the front of the ship or during the lightning strike. Ship can also avoid lighting by moving it forwards or backwards (depending on where the warning symbol for lightning strike is).

- **LEVEL 3-2 – ‘Puzzle: Crystal Dimension’**

After several unsuccessful attacks on the John’s crew, the Queen decides to lead them into her trap – The Crystal Dimension. The place where there is no end to light and all the paths are infinite. John has to find out how to get out of this trap and continue his journey.

John has to use his shadow arrow to make crystals project the beams of darkness from each other instead of light and move them in a correct position. This way it will be possible to follow a path to the exit.

- **LEVEL 3-3 – ‘Defense of the Base: Breaking Through’**

Finally finding a way out of an infinite trap made of crystals John and his crew are being attacked by a massive army of light soldiers. They have to turn their ship into a fortress to withstand the attackers’ assault.

John has to survive for several large and hard waves of enemies and prevent the enemy from destroying ship’s core.

- **LEVEL 3-4 – ‘Light Realm’s General: Lotoris’**

After John survives the enemy assault on their ship, they see The City of Thousands Pillars coming at them through the clouds. Now it is the time for the last battle between armies. John will have to fight Lotoris, the leader of Light’s army and get to the Tree of Pillars which acts as a core for the city’s life.

After breaking through the several defenses John has to destroy Lotoris’s headquarters to be able to fight him in person and progress further.

- **LEVEL 3-5 – ‘Light Realm’s Realm Boss: Lashandra, Queen of the Mirrors’**

When Lotoris is defeated, pillar branches of the Pillar Tree open up the way to the core for John. There is only one last battle left. Fighting Lashandra won't be easy as she was called a Queen of Mirrors not for nothing.

The whole fight between John and Lashandra is happening in the hall full of mirrors. She uses them to create illusions like the projections of herself, evil copies of John and reflect John's attacks. After her defeat John receives back his Soul making the whole city to collapse but giving some time to escape.

5 CONCLUSIONS

The aim of this thesis was to design a mobile game for the client company called Super God Ltd. The only requirements for the work were the creation of first 20 levels as possible prototypes and staying with the basic idea for the game from the company. Otherwise, authors had a complete freedom in the creation of the foundation for the game using some of the already given ideas.

The final work is represented in a large theoretical part about the game development and its concepts, complete Game Design Document and 20 levels that were only planned and explained but not created due to the lack of basic skills and some technical difficulties. Also, thesis includes a basic paper prototype showing an approximate representation of a game and its ideas. It is most definitely not the final prototype and quite possibly will be changed in the future by Super God Ltd.

All the work done before the paper prototype was shown and approved by the Super God Ltd. Client was mostly interested in the game and level design that was created and was pleased with the results of work. Quite possibly this thesis will be taken into heavy consideration for their game and it will be successful with the skillful team the company has at its disposal.

6 DISCUSSION

Author 1 (Nikolai Kalinin):

My overall impression from work varies. On the one hand we did whole theoretical and half of the practical part quite well but on the other hand we couldn't make the prototypes of all 20 levels as it was asked to do. Our main problem was that we lack the skill of creating levels and should have started doing them earlier, but we spend more time on the other parts of the thesis. Even though, I think that we succeeded in our work due to the fact that Super God has a good team to create particular art style and build levels by the given description. Either way, the whole work can be changed and only parts of it can be used in the future.

As a final say, I think I can mention that I improved my knowledge in the game design and understood better how hard it actually is to create levels with the limited time and resources. It is a common knowledge that you have to design a game you would play yourself and in this case I'm sure this can be a great project with a lot of potential and future possibilities.

Author 2 (Aleksi Rundelin):

Working with this project and ideating the game and all the levels with Nikolai was an interesting experience, although I feel that with more work on my part, we could have made most of these levels into prototypes. In addition, the great part of this thesis was done separately, which in my mind hampered the design process.

Level design is a time-consuming job, which is something I didn't expect in the beginning, and figured out too late. However, if I am to return to level-making, I'll know to no longer underestimate the time required to design them. In addition, I would also encourage face-to-face style of working, as at least I feel like I would achieve better when working in a group and both getting and giving feedback of the done work and ideas. All in all, all the articles I read and the thesis process mean that I definitely have gained experience and knowledge from doing this thesis. If this game is to be made a reality, I'm more than interested to see what aspects of our thesis are taken into account during the production process of the game.

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