The Importance of Storytelling as a Reward System in Single Player Video Games

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Abstract:

Storytelling is arguably one of the most prevalent forms of rewards that players are being rewarded with in single player video games; however trends have shown that the completion rates of these types of video games are abnormally low for what one would expect when billions are spent making them.

The purpose of this thesis project is to access and utilize the theoretical tools that video game developers use as a part of their production process, in order to attain a greater understanding of how narrative driven video games are made and where they might be lacking in terms of overall design. Two different testing methodologies will be used in order to find a potential answer to the study's problem statement, which consists of a prototype created specifically to deal with the question at hand and an online questionnaire that attempts to do the same.

Based on the interpretation of the data that was collected, it is possible to conclude that story content is in fact one of the most dominant tools that can be used to keep players motivated and engaged while playing single player video games, to the point where they are willing to do something they don't really care about in order to experience the story.

CONTENTS

1. PREFACE

The following document that you are about to read is a byproduct of a master thesis study that was done in association with Medialogy, a Master's course that is offered through AAU CPH located in Denmark. The project is connected to the *Games Specialization* branch that is associated with the overall program and was written during the spring semester of 2021, where my primary educational focus was related to that of game- and narrative design in association with video games.

The chosen subject matter and themes that are a part of this project stems from a strong desire to understand the underlying concepts that makes video games compelling tools for inciting motivation and engagement within the people who play them, as well as the narrative rewards that can be found within the different genres.

I would like to thank my supervisor Henrik Schønau-Fog for his guidance throughout this journey and I would also like to thank all of the individuals whose research was used to create the project, as well as the people who partook in the tests, without whose work and participation I would not have been able to write this thesis.

1.1 READING GUIDE

The theory portion of the document has been broken down into the following elements:

1. **Narrative Design**
   a. Establishing a framework to be used for narrative production in video games.
2. **Video Game Design**
   a. This section looks at modern dame design tools and academic design approaches related to the subject matter.
   b. Motivation and engagement in video games.

1.2 EXTERNAL LINKS

All of the content related to the project that is not available within this document will be accessible through the following links:

Project Files
The video game project files, with all of the code included can be found here:
https://drive.google.com/drive/folders/1qlYeJuNj2Jfcj079B8668zjm44BaXmzM?usp=sharing

Project Video
A video that shows gameplay from the video game prototype associated with the project can be found here: https://drive.google.com/drive/folders/1a2pmjcsNurXaoRT7sveraWI78FzLpPLb?usp=sharing

Additional Files
Additional project files can be found here:
https://drive.google.com/drive/folders/1wuY44LvzlUgtHhjSfL_xpTU_ddgBL94A?usp=sharing

All of the files and documents will be available online until the end of 2021.

2. INTRODUCTION

The concept of storytelling is arguably one of the most important tools that define the human experience when it comes to learning and understanding the world that we live in [Chaitin, 2003]. The video games industry has over the last couple of decades seen substantial growth in terms of technology and innovation, which has allowed many creators to utilize the ever evolving format to tell many different and unique stories as a part of their video games [Stone, 2019].

Despite the overwhelming success that the medium has had since its inception, where it has slowly grown into becoming one of the most dominant forms of entertainment in the modern world [Michaud, 2016], there is an alarming recurring trend that permeates through most genres of video games that allows for single player experiences, where narrative elements are a part of the main reward system. The issue in question is that the completion rates of those types of video games are abnormally low when considering how expensive they are to make and how much a single copy of a video game costs for an average consumer. This would lead to suggest that the idea of rewarding the player with story content from completing certain actions within a game space, could potentially not be efficient enough to keep them motivated while playing or that the design of those video games do not allow for an engaging experience, where storytelling is the primary incentive compared to other types of rewards when it comes to motivating a player to complete a video game.

The purpose of this thesis project is to access and utilize the theoretical tools that video game developers use as a part of their production process, in order to attain a greater understanding of how narrative driven video games are made and where they might be lacking in terms of overall design. This will allow for a better understanding of where the issue may lie when trying to ascertain why the completion rate of video games are as low as they currently are.

The video game prototype that will be produced as a part of the project will be used as an illustration of how the chosen design theory can shape the design decisions of a video game and it will be used to test peoples' engagement levels and their desire to continue playing based on the rewards they acquire while interacting with the prototype. There will also be a second test that will be conducted with the help of an online questionnaire, which attempts to find similar answers, but on a larger scale, which will allow us to get a clearer overall picture of what motivates players the most based on the type of video game that they like to play. The initial question and research area that will be investigated in this thesis is the following:

"How effective is storytelling as a motivational tool compared to other types of rewards when it comes to keeping people engaged and motivated while playing single player video games?"

It is worth noting that this project was created during the Covid-19 pandemic, which has had an effect on the overall project in different ways, especially when it comes to the testing of the video game prototype, as it removes certain user experience evaluation tools from being used, including mass in person testing and implicit data collecting methodologies due to safety reasons.

3. RELATED RESEARCH

The following chapter outlines theory related to narrative- and game design, which will be used to produce multiple frameworks that are going to be utilized in order to create a video game prototype to find an answer to the problem statement. Both theoretical fields are quite large, so a decision was made early on to only focus on the theory which would serve a purpose when it comes to designing the video game prototype.

3.1 DEFINING A NARRATIVE FRAMEWORK

In order to effectively tell a story through the medium of video games, I felt that it was necessary to create some basis of a framework to work from when it came to designing the narrative for the prototype [Squire, 2008]. This subchapter will contain information related to how one could potentially create a narrative for a video game; this includes narrative theory, as well an outline of the tools that can be utilized to convey story related information to the player. As a part of the framework, I decided to utilize a basic structure that contains 5 key elements, which are the following [Obstfeld, 2002] [Besmond, 2019]:

- The *characters* are the individuals who are partaking in the story that is being told. They can either be the character(s) that the player is able to take control of or the NPCs.
- The *setting* is where the story takes place in terms of locations; this could take the form of a level or a virtual environment.
- The *plot* is used to describe everything visible and audibly presented to the player.
- *Conflicts* are the main events that drive the story of a video game forward.
- *Resolution* is the solution to the *conflict* that the characters are associated with and have to overcome as a part of the narrative. Within the context of a video game, this would for example be related to defeating the final boss, which then solves the overall conflict.

By understanding what each element that a narrative consists of, will allow me to structure my workflow for the prototype and it will also give me the ability to see if there are any inconsistent story elements that may have an effect on the individual parts of the narrative.

3.1.1 NARRATIVE STRUCTURES

Narrative structures, which are literary elements, are used to describe the structural framework that a narrative is presented to an observer and can be utilized for different methodologies of storytelling which can be applied to narratives within video games [Truby, 2007].

LINEAR AND NON-LINEAR NARRATIVE STRUCTURES

In literature, the concept of *linear narratives* refers to the telling of a story that happens over a linear period of time, which has a clear beginning and ending [Madej, 2008]; this means when an author utilizes this type of storytelling methodology, the order in which events are portrayed corresponds to the order in which they occur. This type of narrative structure has been very common in video games [Stone, 2019], as it supports the traditional reward structure where a player would get a reward, in the form of story, after completing a task; it is also, based on observations of high level video game productions and

personal experience, a lot easier to implement a linear narrative structure compared to something that is more non-linear.

Non-linear narratives do not abide by the same abovementioned restrictions [Pinault, 1992], as it allows the participant of a narrative to experience different types of story-related information in a non-linear fashion that may occur on different points on a narrative timeline. This type of storytelling is relatively common with open-world video games [Stone, 2019], where the player could potentially have free reign to move around and interact with different characters, depending on how a video game is designed, at any point in the story. An issue that could potentially arise when utilizing this type of structure is that the player may interact with events in an order that could be considered to be less than ideal for the flow of the narrative; for example, they may not encounter the events in the correct order or they might end up missing them entirely [Schoenau-Fog, 2015].

3.1.2 ENVIRONMENTAL STORYTELLING

The primary focus of environmental storytelling is to tell the player a story within the game world that they inhabit, with the help of the environment that they are interacting with in real-time [Carson, 2000]. This can be done by intentionally placing objects or textures in a game space, which can help to provide the player with additional layers of storytelling as is illustrated in the image below.

Fig. 1 - Screenshot taken from the video game Dead Space, by Visceral Games.

This type of narrative structure requires active participation and engagement from the side of the player, for the methodology to function. If not done correctly, or if the player simply does not care about it, the narrative elements shown through the environment will be lost; Based on observations from previous projects, for the sake of the story, one should only look at environmental storytelling as a supplementary tool that adds to the overall narrative.

3.1.3 LUDONARRATIVE DISSONANCE AND CONSISTENCY

The term *Ludonarrative Dissonance* was created by Clink Hocking, a video game developer at Ubisoft, and he defines it as a conflict between the narrative of a video game and the story that is being told through the gameplay itself [Hocking, 2007]. The term was created after he played through the video game Bioshock, where he felt that there was a level of dissonance between the themes was that promoted within the video game, which was centered on the idea of self-interest when it came to the gameplay and

selflessness through the narrative, which would result in a violation of aesthetic distance[1], that according to him, would actively pull the player out of the video game.

There are many varied examples of *Ludonarrative Dissonance* in modern video games, as a result of designers not taking this concept into account. For example, if we looked at the video game series *Uncharted* [*Dunn, 2020*], the main character is portrayed as a likeable treasure hunter similar to that of Indiana Jones as a part of the overall narrative; however, when assessing the story through the gameplay, he is also a cold hearted mass murderer, as the primary gameplay element of that video game series revolves around the concept of shooting and killing enemies that stands in his way [Dunn, 2020].

A great example of a video game that is considered to have high levels of *ludonarrative consistency,* which would mean that there is a high level of harmony between the narrative and the story told through the gameplay, would be that of *Dead Space* [Makedonski, 2007]. In that video game, the player takes on the role as an engineer on a large spaceship floating in space, which is filled with unsightly monsters and the reason why it is considered to have a high level of consistency, is because the gameplay conveys a sense of terror and loneliness that the narrative strives to establish. Another interesting thing about *Dead Space*, which is relatively uncommon in video games, is that all of the information that is given to the player is also available to the main character, for example:

- There are no non-diegetic user interface elements on the screen when the video game is actively being played. An example would be the navigation tool that is built into the suit, which provides the character and the player with an augmented reality marker that indicates where the player should be going.
- The weapons that are used by the character to defend themselves from the dangers that lurk on the spaceship are based on futuristic mining and engineering tools; the character that the player is controlling is an engineer, so it makes sense that they would be able to use this type of equipment intuitively.
- The majority of narrative interactions are done through radio and video communications, where non-playable characters are providing the main character and the player with story content and tips through the use of a teleconference tool that is built into the suit, which is visible to both the player and character.

Ludonarrative dissonance can also be considered a good addition to certain types of video games, as it allows the designers to build scenarios that are focused on gameplay over story. An example of this would be immortal non-playable companion characters that are a part of the gameplay, despite being portrayed as normal beings as a part of the narrative. A general issue that people have with companion characters that are part of the gameplay [Bycer, 2016], is that they do not want to be escorting characters that they have no control of while playing, as it has the potential to ruin the flow of the gameplay if the character does something that it is not meant to do, i.e. get stuck in the environment, moves slowly or being easily killed due to poor AI. In order to improve on the gameplay experience, a developer can make it so that the companion is basically ignored by all of the hostile characters outside of narrative encounters, while still

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[1] Aesthetic Distance refers to a gap between participants' conscious- and fictional reality presented to them in a work of art.

being able to partake in the gameplay segments. Granted, it may ruin the immersion into the narrative when seeing a character that is being ignored completely by a hostile entity if you are actively thinking about it while playing, but it could be considered to be a worthy tradeoff when considering the potential problems that have previously been mentioned.

Whether or not the concept of *Ludonarrative Dissonance* has an effect on a player, based on my objective observations of watching people playing single player video games, highly depends on who is playing the video game, their understanding of narrative design and how engaged they are while playing.

3.1.4 STORYTELLING IN VIDEO GAMES

As a part of this project, I decided that I wanted to analyze different types of storytelling methodologies that have been utilized over the last 30 years, in terms of structure and how story information is being presented to the player. The methodology that will be used for this assessment will consist of me looking at gaming consoles from different generations of gaming consoles and the video games that were released on those systems. Once they have been analyzed, I'll note down every unique way those stories have been told during each generation and how they have evolved over time.

Fourth Generation (1987-1993) – The general type of content that was released during this era of video games on consoles such as the *Sega* Genesis and *Super Nintendo Entertainment System*, is primarily focused on arcade-like experiences, where storytelling appears to be more of an afterthought. The general way that story is told in these video games is done through text coupled with music and there quite a few cases where storytelling is done by using either limited 2D animation or images in a slideshow format.

The video games that were looked at from this generation of gaming consoles were: *Castlevania: Bloodlines, Mortal Kombat, Michael Jackson's Moonwalker, Comix Zone, Ninja Gaiden, Streets of Rage II and Super Street Fighter II.*

Fig. 2 - Screenshot taken from the video game Ninja Gaiden, by Tecmo.

Fifth Generation (1993-1998) – With the introduction of 3D with the help of consoles such as the *Sony PlayStation* and *Nintendo 64*, has allowed for a larger variety in the ways that story is presented to the player; there is high reliance on conveying it visually through 3D animated cutscenes that contains audio in the form of voice overs and music in the background; Voice acting is not always a guarantee and there are cases where cutscenes are shown to the player solely with music in the background. The general structure of the narratives that was analyzed, showed that most of them were linear, where the flow of content consisted of the player being given a cutscene at the start of each level and one at the end, with no real story content in between. When it comes to environmental storytelling, there are, based on my

assessment of the video games that were looked at, very few if any video games that told a story through the environment.

The video games that were looked at from this generation of gaming consoles were: *Tenchu: Stealth Assassins, Spider-Man, Spyro The Dragon, Tomb Raider, Oddworld: Abe's Oddysee, Silent Hill, Crash Bandicoot 3: Warped and Metal Gear Solid.*

Fig. 3 - Screenshot taken from the video game Oddworld: Abe's Oddysee, by Oddworld Inhabitants.

Sixth Generation (1998-2005) – This generation introduces the consoles *PlayStation 2* and *Xbox*, which keeps the general narrative structures that were established from the previous era. The stories however, are becoming bigger and are now the primary form of reward for completing tasks as a part of the gameplay. The overall experiences of the video games became more varied during this generation, as more genres are using storytelling as rewards for completing basic actions. Conveying story information solely through text appears to be close to non-existent and more video games during this era had voice acting as a part of their cutscenes. This generation also had different cases of environmental storytelling, with more varied experiences and genres.

The video games that were looked at from this generation of gaming consoles were: *Grand Theft Auto: San Andreas, Halo, The Warriors, Twisted Metal: Black, Devil May Cry, Psychonauts, Prince of Persia: The Sands of Time and Shadow of the Colossus.*

Seventh Generation (2005-2012) – Most of the highly revered video games from this era of video games, has a larger emphasis on telling compelling stories as rewards for playing and the characters themselves appear to be less two dimensional in comparison to the previous eras. Story is becoming the primary focus of the gameplay experience and there is less innovation in terms of actual gameplay. A relatively large change when it comes to conveying storytelling information to the player is that the format has evolved beyond the *Cutscene to gameplay to cutscene* structure and there is now story content given to the player in between the larger story rewards. The world of environmental storytelling has also evolved quite a bit during this generation of video games, as more video games are using this methodology to provide the player with additional story content. Another element that is more utilized during this generation is the addition of interactive narrative events, which has been labeled as *Quick Time Events* that allows the player to participate in cinematic story segments.

The video games that were looked at from this generation of gaming consoles were: *Bioshock, Uncharted 2: Among Thieves, Gears of War, God of War, Yakuza 5, Journey, The Walking Dead and Mass Effect 2*

Eighth Generation (2012-Present) – The era, which we are now in and in the process of moving away from, sees very little change compared to the previous era. However, the overall quality of storytelling improves quite a bit in terms of quality.

In summary, the general methodologies that have been used during those 5 generations have consisted of text, audio, visual (cutscenes), environment and interactive events; some of them have clearly been used out of necessity due to hardware limitations, however as the video game consoles become more powerful, we see less of certain types of formats used to convey story information to the player and story has become one of the most dominant forms of rewards in single player video games.

3.2   GAME DESIGN

As a part of this thesis project, I'll be using different video game design methodologies that have their roots in both academia, as well as in the video game industry; the difference between the two is that the academic methods are more than likely to be less utilized in the production of modern video games, compared to that of the industry theory currently in use by developers. There is also an issue with the fact that the industry theory may not have a specific origin that can be referenced to directly and the material itself could be different depending on whichever source is used, unlike academic theory, which is well documented.

While attending DADIU as a game designer, I discovered that there was a general lack of overall structure, when it came to design workflows [DADIU, 2020]. As such I created a design document, which was constructed based on multiple freely available design document models that were made accessible by professional game designers. I decided to use this document in order to structure the basic elements that were going to be implemented into the prototype; this document can be found in the appendix and it will cover most of the final implementation in a note format.

3.2.1 DEFINING PLAYER MOTIVATION AND ENGAGEMENT

Player motivation is defined as the factor related to how likely a player is motivated enough to continue playing or completing a video game [Chozland, 2016]; without it there would be no desire for the player to continue. When it comes to motivation within the confines of video games, it is possible to divide it into two different categories:

- *Extrinsic Motivation* is related to external factors [Ryan & Deci, 2000] that can either have a positive or negative effect on the player's experience when playing a video; this as an example, could take the form of being a reward from performing well under certain circumstances or punishment from doing poorly.
- *Intrinsic Motivation* is related to internal motivations factors that come from within the player [Ryan & Deci, 2000]. An example of *intrinsic motivation* could be if a person was playing a video game for the experience itself, rather than being motivated to do something for a reward.

Studies have also found that there are motivational differences between men and women who play video games [Yee, 2016]. The survey data that was collected suggests that the primary motivations when it came to males were that competition and completion within video games were highly preferred, compared to women who had a preference for completion and fantasy.

In the research paper *The Player Engagement Process* [Schoenau-Fog, 2011], the characteristics that are related to *player engagement* are defined as a longing to continue playing a video game, where the player is actively committing themselves to the act of wanting to return to playing a specific video game. There are also mentions that there is a difference between *player engagement* and *motivation*, as motivation is related to the reasons for why a person would want to play a video game to begin with. An example of a player being motivated to play a game could come from boredom; but it is not until the player becomes excited and wants to continue playing, which is when engagement is experienced. In order to provide an overview of the player engagement process, a framework was constructed that looks at the different categories of engagement and how they interact with each other. The paper also provides a ranking of the components and categories associated with the AO3 framework that is a part of the paper:
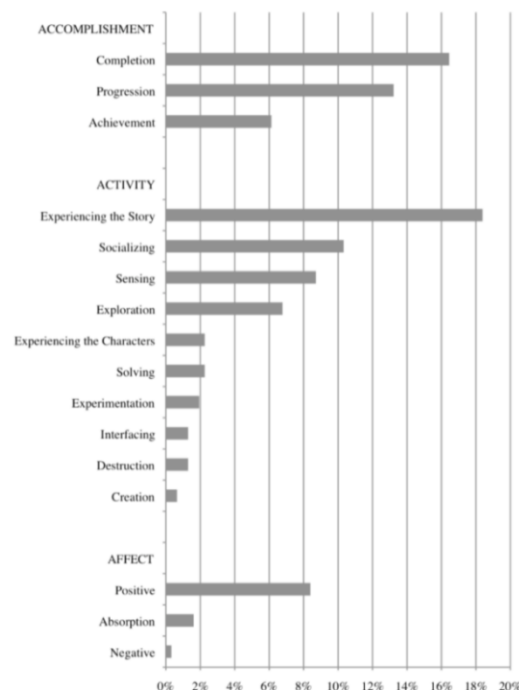

Fig. 4 - The ranking of importance in relation to the OA3 framework [Schoenau-Fog, 2011].

Based on the assessment of the results that can be found in the figure above, we can see that during the creation of the paper itself, that the primary activity that the participants preferred when it came to player engagement, was that they wanted to experience the story of the video games that they played, which is something that is worth noting, as it is directly related to the question that this project is trying to answer.

Quantic Foundry, which is a market research company focused on studying 'gamer motivations', has developed a motivational model from survey data retrieved from more than 500,000 participants [Yee, 2015]. By utilizing the data that they have been able to collect thus far, they were able to identify 6 different categories, which contain a total of 12 motivation types that the participants identified with when it came to their preferences and what motivated them to play video games.

Fig. 5 - Yee's Motivational Model [Yee, 2015].

The 6 categories that have evolved over time, in order to accommodate certain types of players, and the model that will be used for this project, will consist of the second version of the model, which is the newest version as of when this project was created. It may evolve over time, but that is an element that cannot be taken into consideration as a factor for this project. The different categories of motivational factors are as followed [Yee, 2015]:

- **Immersion** – People who identify as having high *Immersion* scores, want to play video games with interesting narratives, settings and a desire to be immersed in the worlds they provide.
- **Creativity** – People who identify as having high *Creativity* scores, want to play video games that allow them to experiment within game worlds, allowing them to customize their own experiences.
- **Action** – People who identify as having high *Action* scores, want to experience fast-paced action and thrilling events. People with low *Action* scores have a tendency to have an opposite preference when it comes to the structure of video games.
- **Social** – People who identify as having high *Social* scores, want to play video games where they have the opportunity of being able to compete and socialize with other players.
- **Mastery** – People who identify as having high *Mastery* scores like to play video games where they have the opportunity of being able to challenge themselves and perfecting their skills.
- **Achievement** – People who identify as having high *Achievement* scores are driven by the acquisition of items, collectables and power regardless of what they need to do in order to acquire them. People with low *Achievement* scores have a tendency to have an opposite preference when it comes to the structure of video games.

By having outlined this motivational model, will allow me to assess the ideal target group for the prototype that is going to be developed alongside this project and it will also serve as a tool that can be used in the testing questionnaires, so that we can see the participants' preferences, as there is potential likelihood that the participants might not fall into the category that the prototype finds itself in.

3.2.2 GAME REWARD SYSTEMS

When deconstructing the problem statement for this project, one of the key elements is related to how important story is as a motivational tool; seeing as story is not the only form of rewards that can be given to the player, it felt like a necessary to outline the different types of rewards that are currently in use in video games. Based on the work done by Wang et. al [Wang & Sun, 2012], there is a large list of possible reward types that players can be rewarded with:

- **Story** – Content, which can take the form of cutscenes or other types of storytelling methodologies, which is being provided to the player after having completed specific types of actions like defeating an enemy, clearing a level or completing a video game.
- **Performance Review** – Score systems used to track a player's performance, which is generally used as a tool for self-assessment and comparison.
- **Gameplay Modifiers –** This type of reward can take many forms from visual or performance upgrades for the playable character, the acquisition of resources that helps the player while playing to the unlocking of new gameplay features; basically anything that changes the gameplay.
- **Achievements** – Rewards that are generally tied to player accounts or avatars that players can collect while playing a video game.

Seeing as this project and the associated problem statement is solely focused on single player video games, certain extrinsic reward types will not be mentioned in this chapter, as there are differences when it comes to rewards as motivational tools when comparing solo to multiplayer experiences.

3.2.3 RATIONAL GAME DESIGN

Rational Game Design (RGD), which was taught to me during my stay at DADIU in the year 2020, is centered on the concept of what the purpose of gameplay is [McMillan, 2013]. For example, it could be attacking an enemy with the use of a weapon or jumping from one platform to another. As such the individual elements have been broken down into 7 different components, which equates to the overall experience of the gameplay as is seen in the figure below.

1. Goal	What is the goal of the gameplay? *Ex: Kill enemies with a firearm*
2. Mechanics	What must the player do to achieve the gameplay? *Ex: Move the crosshair over the target and shoot*
3. Skills	What are the required skills for each mechanic? *Ex: Precision / Measurement / Timing*
4. Inputs	What are the expected inputs? *Ex: Move the Right Analog Stick to aim / Press RT to shoot*
5. Parameters	What are the parameters for each mechanic? *Ex: Size / Position / Speed / Predictability / Window of Opportunity*
6. LD Patterns	What do the parameters mean in terms of Easy/Medium/Hard LD patterns? *Ex: Create LD building blocks for Easy/Medium/Hard cases of each parameter*
7. Signs & Feedback	Which signs are used to prompt a player's reaction, and what kinds of feedback does the player receive afterwards? *Ex:* *SIGNS = Crosshair turns red over target* *FEEDBACK = Hitting the target triggers an impact sound*

Fig. 6 - The 7 RGD components, taken from material provided by DADIU [DADIU, 2020].

The RGD conception process itself consists of three different steps, the first looks at the purpose of the gameplay, the second concerns itself with variety in order to keep the player engaged and the third is about the distribution of all of the video game elements throughout the entire experience in terms of level design. In order to conceptualize the goal of a piece of gameplay, we need to understand the mechanics and what is required in terms of skill, which is connected to the expected inputs required by the player to perform a certain action.

Atomic design [McEntee, 2012], which is a subcategory of RGD, primarily focuses on the mechanics, skills, inputs and atomic parameters. An atomic parameter is a factor that makes mechanics more or less difficult and there may be multiple of them per mechanic and each of them has an impact on their difficulty. An example of how this would look like within the context of melee combat, it could look like the following:

	ATOMIC PARAMETERS	EASY	MEDIUM	HARD
PRECISION SKILL	Size of enemy on screen	Almost full screen (90%)	60% of the screen	30% of the screen
	Enemy Speed on screen	Slow Speed	Medium speed	Fast speed
TIMING SKILL	Enemy predictability	Predictable (moves in 1 direction	Alternation (Way path movement)	Chaos (unpredictable)
	Window of opportunity	Almost always available (<80%)	Sometime available (<50%)	Rarely available (<10%)
	Hitting duration	0.5 sec to kill (1 hit to kill)	2 sec to kill (4 hit to kill)	3 sec to kill (6 hit to kill)

Tab. 1 - Example of how Atomic Parameters can be utilized to tune the difficulty of a NPC [DADIU, 2020].

When analyzing the parameters in the table above, we can see how the parameters change based on the difficulty level, where enemies become harder to hit and kill as a result of changing the health of the enemy, the speed and predictability in which they move around, as well as how big they are on screen when it is possible to attack them.

There are different ways when it comes to achieving variety and pacing as a part of a gameplay experience. One example could be one-off gameplay mechanics that are only available through a specific event that only happens once during the entire run-time, or visual or mechanic modifiers that change the way that the player over time. In order to keep track of all of these elements, it is suggested that one should use a RLD table that can be used to distribute the features. I've taken the liberty to create a random example to illustrate the how useful it when trying to keep track of multiple elements in the table below

RLD TABLE	MISSION 1	MISSION 2	MISSION 3
ABILITIES			
Jumping	Introduction		x
Running		Introduction	x
MECHANICS			
Moving platforms	x	x	x
Enemies		x	x
REWARDS			
Gun			x

Tab. 2 - Example of how one can distribute content over various levels within a video game [DADIU, 2020].

The way that a table should be structured highly depends on the type of video game that is designed and one should also take into account that players have different types of motivations, which will shape how mechanics are distributed to the player.

3.2.4 MECHANICS, DYNAMICS AND AESTHETICS

MDA which is short for Mechanics, Dynamics, and Aesthetics, is a design framework that was created by Hunicke et al. with the goal of trying to formalize an approach to understanding video games and what makes them entertaining; the primary goal of the framework is to make it easier to deconstruct and design games in an objective and iterative process [Hunicke, LeBlanc & Zubek, 2004] and as such, they've broken their framework into separate, yet distinct components:
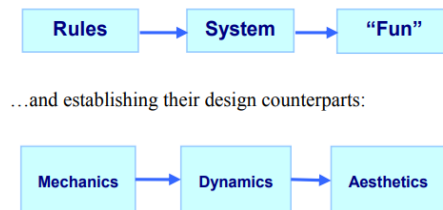

Fig. 7 - MDA framework components [Hunicke, LeBlanc & Zubek, 2004].

They suggest that both the designer and the player see video games from different perspectives. When it comes to the designer, the *mechanics* provide *dynamics* with system behaviors, which results in a specific *aesthetic* experience for the player, whereas the opposite is true from the side of the player and small changes in one layer may have an effect on another. Their definition of the tree components are as followed:

- **Mechanics** is used to describe the different components that a video game has, at the level of how data and algorithms are represented, this includes concepts like rules and the different actions that can be taken by the player.
- **Dynamics** describes the behavior of the video game mechanics based on the input of the player and how they cooperate together.
- **Aesthetics** describes the emotional responses that are invoked within the player when they interact with a specific system.

The aesthetical part of the framework also goes into the philosophical question of what makes video games "fun". The term fun as a descriptor is extremely vague, as every person has a different perception of what the word means for them, which makes it hard to quantify whether or not a desirable emotional response from a specific mechanic has been achieved. And as such, they have created a more focused vocabulary that aims to broaden the understanding of aesthetic components and how fun can be perceived in different ways:

1. **Sensation**
   Game as sense-pleasure
2. **Fantasy**
   Game as make-believe
3. **Narrative**
   Game as drama
4. **Challenge**
   Game as obstacle course

5. **Fellowship**
   Game as social framework
6. **Discovery**
   Game as uncharted territory
7. **Expression**
   Game as self-discovery
8. **Submission**
   Game as pastime

Fig. 8 - MDA aesthetical components [Hunicke, LeBlanc & Zubek, 2004].

As a part of this expanded vocabulary, they've provided different examples of how it can be used to assess different types of games. If we take *Charades* and compare it to a video game like *Quake*, we can see that they have different aesthetical components and priorities:

- **Charades**: Fellowship, Expression, Challenge.
- **Quake**: Challenge, Sensation, Competition, Fantasy.

Unlike Quake, *Charades* due to how the game is structured has an emphasis on fellowship over challenge, whereas Quake provides the player with challenge as a main component of its gameplay. Both games contain competitive aspects and they succeed when the various teams (or players) are emotionally invested when it comes to winning a match against each other.

If we go beyond the examples that Hunicke et al. has provided as a part of their framework and look at a video game like *World of Warcraft* [Blizzard Entertainment 2004], which has many different mechanics and system, we fall into a situation where the video game touches upon every aesthetical component in one way or another. If we dig a little deeper and take a mechanic such as the *Dungeon Finder* system, which automates the process of players being able to find each other more easily, one would think that this system would promote the concept of fellowship. However, in the case of this specific feature, it seems to have the opposite effect, as it completely removes the requirement of players having to interact with each other, which is antithetical to the purpose of said mechanic. This is an example that illustrates an issue that goes beyond the perspectives of both the designer and the user, as the feature itself can be perceived in multiple ways by both parties, regardless of how it was intended and designed, which may affect the overall video game and in fact promote a certain type of behavior on the side of the player, which is facilitated by the designer.

This type of problem would lead to suggest that the framework itself does not take concepts like player behavior and potential biases into account and such issues should be addressed through other means of analysis. There have also been other criticisms of the framework related to its functionality despite its popularity, as it appears that it has quite a few weaknesses; this can be seen in the eight kinds of 'fun', which the fundamentals on how more types of emotional responses can be explored [Dormans, 2012]. Others have also called it out for neglecting different design aspects, while focusing primarily on game mechanics, which results in it not being suitable for every video game out there, which is similar to my assessment of the framework [Walk, Görlich & Barret 2017].

3.2.5 HOLISTIC GAME DESIGN

The primary goal of holistic game design is that it is used to assess the interconnection between different video game elements; the more connected these elements are, the more holistic the design of a video game becomes as a result. The *Serious Game Design Assessment* (SGDA) framework created by Mitgutsch and Narda [Konstantin & Narda 2012], which was originally intended to be an assessment tool for serious video games, for the purpose of understanding the impact that a video game has on its user base, has the potential to also serve as a holistic game design framework, as it is based on the same principles.

Fig. 9 - SGDA framework components [Konstantin & Narda 2012].

In order to illustrate how this framework would work as a holistic design framework, let's create a fictional example of a video game whose primary purpose is meant to be entertaining for a young audience that normally wouldn't play video games as a hobby. Due to the nature of the audience being young and inexperienced, means that concepts such as play literary has to match the competence level of the players, if we seek to make the gameplay entertaining; this then feeds into the learning curve of the video game: if the video game is too hard, they might end up being frustrated and if it is too easy, then they could potentially get bored. In order to achieve an overall high level of holistic design within this scenario, every component has to reflect on the primary purpose of the video game; if done correctly, then the design should be ideal for the targeted audience.

3.2.6 SEMIOTIC GAME DESIGN

While researching various video game design frameworks and theory that could be utilized for the implementation of the video game prototype that is going to be a part of this thesis project, there was a strong desire to find any form of literature that could rival that of semiotics theory, which would allow a designer to study the various elements that could be implemented into the design of certain features and level design, in order to communicate certain aspects of a video game more clearly to the player in a structural format that would be similar to both the *Saussurean* and *Peircean* traditions respectively. Much to my dismay, such a framework does not exist, at least not in the desired format from what I could find, and as such, I would like to propose an outline to a potential framework that can be used to achieve the above mentioned desired system that would allow for a formal and iterative approach to the design of communication within the field of video games. The idea of creating a framework such as this one came from having worked on multiple video games in association with DADIU [DADIU, 2020], where we saw clear examples of wrongly chosen signs being used to confer meaning, which lead to player confusion.

For the uninitiated, semiotics as it was originally conceived is about the study of communication from the viewpoint of signs and symbols in order to derive meaning from their usage, which was created by the French linguist Ferdinand de Saussure. Charles Sanders Peirce, a philosopher and contemporary of Saussure, has also contributed to the field of semiotics in a similar manner with his own way of interpreting signs. The model that Saussure proposed is a two-part model that defines what a sign could be [Chandler 1994]:

- A 'Signifier' is the form that the sign takes.
- The 'signified' is considered to be the concept that the signifier represents.

The combination of both the signifier and signified is referred to as a signification; an example of this can be found in the figure below, which shows the image of a tree as the 'signified' object and the word 'tree' in English, which is the signifier of said tree; when a person uses the word in a sentence, either verbally or in a written format, people who can understand the language being used and the symbols that each of the letters represents, would know that the person utilizing the word is referring to the visual representation of a tree.
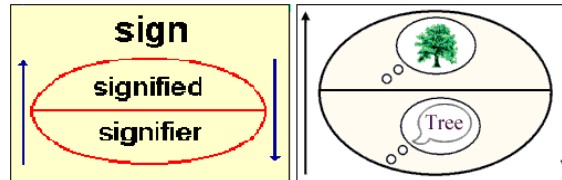

Fig. 10 - Visualization of semiotic components related to the Saussurean tradition [Chandler 1994].

Peirce created three types of different signifiers which are known as icons, indexes and symbols and deals with visual representations of signs [Chandler 1994]:

- An **Icon** has a visual likeness to the signified object.
- An **Index** is an indication of what a sign could represent.
- A **Symbol** shares no likeness between the signifier and the signified. Symbols unlike Icon and Indexes are culturally learned.

Both semiotic traditions are constantly being used within the field of video game production, even when a designer is potentially unaware of the fact that they are using the above mentioned theory, which lends credence to the need for a system that allows them to assess the elements that they implement into their games. If we were to analyze an example of how semiotics have been implemented into video games with great effect, then we should look no further than the concept of red barrels, which are used as symbols for explosions within different genres of video games.

Fig. 11 - Screenshot taken from the video game Half Life 2, by Valve.

Depending on how they are utilized, it should be very apparent to most people that shooting or harming a barrel that is labeled with the words 'flammable', would produce an explosion; the color red is also a symbol in itself, as it represents the color of fire. The concept of red barrels have been around for so long that it is possible for designers to simply make a barrel red in a video game, and the player, if they are

aware of the trope, should immediately be able to know the intent of what the designer wants the player to do with said barrel. Granted, people will not always by default know the intent of a sign, which means that it is also the designer's responsibility to teach the player its use case; in the case of red barrels, if we were to implement them into a *First Person Shooter* video game, the ideal way to tell them about its usage, would be to place it in the line of fire in front of the player in a scenario where they would end up shooting at it either intentionally or unintentionally. This allows the player to intuitively learn the purpose of the barrels, as they themselves are triggering the events that may lead to a scenario where a barrel blows up [Johnson 2001].

There have been many different examples of how designers have incorrectly used semiotics in a way that can actively confuse players. A concrete example would be from the PC version of the video game *Assassin's Creed 2* [Ubisoft 2009]. At the start of that game, the player is put in a situation where they have to click on four different keyboard buttons in order to complete the initial part of the tutorial. The issue however, is that the video game asks the player to press buttons labeled with icons that cannot be found on any standard keyboard or controller.

Fig. 12 - Screenshot taken from the video game Assassin's Creed II, by Ubisoft [Ubisoft 2009].

By not using the correct signs as a part of the UI design, as is shown with this example, makes it harder for the player to complete basic actions that would be considered to be trivial, had the designer done their job correctly. When working with video games, it should be paramount from the side of the designer to make sure that the intent of their design reflects the sign that they are producing is as clear as possible, so that the player has a proper way of understanding their intent.

As previously mentioned, this framework is an attempt to formalize how a designer can assess what they are putting into their video game and how the player reacts when interacting with certain video game elements, and as such, I've tried to boil it down to the following three pillars:
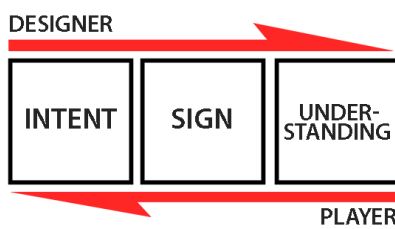

Fig. 13 - The three components that make up the Semiotic Game Design framework.

- **Intent** describes the intended idea behind a gameplay element, which can basically take the form of anything within the game space, and its purpose as a part of the experience.
- **Sign** is the object or concept that is created from the intent of the designer.
- **Understanding** describes the knowledge that the player has before interacting with the sign created by the designer; the goal of the designer is to make sure that the sign is understood.

Both the designer and the player have different perspectives when it comes to interacting with a sign. The designer should by default know everything about it, from its functionality to the purpose that it serves throughout the entire gameplay experience, and the player only knows what the designer tells them about the functionality of said sign if they have never encountered it before. This uneven relationship when it comes to the knowledge that a sign represents requires that the designer should be more vigilant about how they implement a sign into their video games. This is especially true if we go even deeper into the general meaning of certain signs, as there could be a cultural component connected to a developed sign that predates its creation within a video game.

3.2.6.1 SEMIOTIC LEVEL DESIGN

The concept of *Semiotic Design* based on what I have observed through many hours of watching behind the scenes content created by video game developers to promote their games, it very much apparent that there is room for this design framework to bleed into the space of level design as well, as there seems to be a lack of cohesive terminology that is being used to convey the type of information that is a part of the abovementioned subchapter.

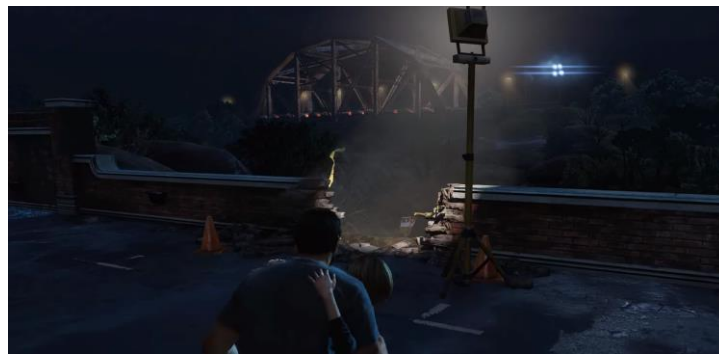*Fig. 13 - Screenshot taken from the video game The Last of Us, by Naughty Dog.*

If we look at a concept like lighting composition and color usage to convey the way forward to the player, as is seen in the image above, it basically follows the flow of the framework in the sense that the designers wants to assign intent to a specific environmental item that the player has to learn to understand.

3.3 STATE OF THE ART – ANALYSIS OF NARRATIVE AND GAME DESIGN IN VIDEO GAMES

The following sub-chapter is dedicated to the analysis of video games released by both small and large scale studios, where narrative elements are the primary incentives and motivational tool meant to keep the player engaged until the end; the analysis of these video games will also help when it comes to generating design ideas for the prototype. When doing the initial research into the subject matter of whether or not storytelling is a sufficient tool to keep players engaged, I decided early on to conduct a small quantitative survey that looked at the completion rates of different types of video games from various genres that were released over the last 15 years. The 10 video games used for the survey were randomly selected based on the criteria that they had to have been well reviewed by both critics and their user base, with a score that is well above average, which meant that they would all be well liked by the gaming community as a whole. Video games that were controversial or suffered from extreme performance issues on one of the two platforms the data was collected from were actively avoided, in order to try and minimize the possibility of biases on the side of the individuals who have taken the time to voice their opinion about these games. The chosen systems were PC (Steam) and PlayStation 4, as achievement data, which can be used to assess completion rates, was freely available on those two platforms. The data related to the amount of time it would take to complete the games comes from aggregated self-reported sources.

It is worth noting that the data itself, due to the small sample size and the fact that it is constantly changing, does not reflect the average completion rate of video games in general and is only meant to showcase that it is an apparent issue in certain cases.

GAME	METACRITIC SCORE	PLATFORM	COMPLETION RATE	TIME TO COMPLETE
GRAND THEFT AUTO V	96 (CRITIC) 7.8 (USERS)	PC	28.8%	~31 hours
FIREWATCH	81 (CRITIC) 7.1 (USERS)	PC	61.7%	~4 hours
STAR WARS JEDI: FALLEN ORDER	81 (CRITIC)* 8.2 (USERS)*	PC	20.5%	~16 hours
GRIM FANDANGO: REMASTERED	84 (CRITIC) 8.1 (USERS)	PC	17.7%	~12 hours
THE WITCHER 3: WILD HUNT	93 (CRITIC) 9.4 (USERS)	PC	26.4%	~51 hours
RED DEAD REDEMPTION 2	97 (CRITIC) 8.5 (USERS)	PS4	28.6%	~48 hours
MARVEL'S SPIDER-MAN	87 (CRITIC) 8.7 (USERS)	PS4	50.7%	~16 hours
DEATH STRANDING	82 (CRITIC) 7.3 (USERS)	PS4	29.3%	~46 hours
JOURNEY	92 (CRITIC). 8.3 (USERS)	PS4	37%	~2 hours
OUTLAST	80 (CRITIC) 8.3 (USERS)	PC	19.6%	~5 hours

Tab. 3 – Collected Metacritic, PC, PS4 and completion speed data [Metacritic 2021] [Ziff Davis 2021].

As we can see from the video games on the list, there are some extreme cases where the completion rates are below that of 30% despite the overwhelming praise and sales numbers that some of them have had since their inception and some examples with a lower review rating, but has a higher completion rate. In order to understand why this is the case, I'll be analyzing two of the video games on the list whose completion rates are on the opposite sides of the spectrum. The way that I will be doing this, is by playing both video games and assessing the different design methodologies that the designers used for both of them.

3.3.1 Analyzing Firewatch

Firewatch is a short linear narrative-driven video game that also utilizes an adaptive narrative structure as a part of the gameplay to tell its story [Campo Santo 2016]. The story consists of the player taking the role of Harry who is working as a park ranger. The primary way that the story is told, is done through audio that comes through a walkie-talkie; the unique element that is a part of the story, is that the player can choose how Harry reacts to his environment, which has an effect on the story.

Fig. 14 - Screenshot taken from the video game Firewatch, by Campo Santo [Campo Santo 2016].

The gameplay itself is very simplistic, as the player can only pick up objects and communicate with characters through different means. There is no skill requirement when it comes to the gameplay, which means that there is no barrier beyond the narrative that can keep the player from completing the video game; one major issue that comes from utilizing this design methodology is that the narrative has to carry everything else when it comes to keeping the player engaged and if they are not interested in the story; there is no alternate reward type they can pursue as a part of the gameplay.

3.3.2 Analyzing Star Wars Jedi: Fallen Order

Star Wars Jedi: Fallen Order is very much the opposite of what Firewatch is in terms of overall design structure, as it is an open-world video game with a pseudo non-linear narrative that cannot be influenced by the player [Respawn Entertainment 2020]. By stating that it is a pseudo non-linear narrative, I mean that up to a certain point in the narrative, the player has free reign when it comes to moving between planets, where the core gameplay takes place, until they are forced down linear paths. The story itself follows a young Jedi who lives in hiding and his narrative goals evolve over time as the plot progresses; the ending is open-ended and does not provide a conclusion to the narrative, as it is clear that the developer wants to make this video game into a franchise. The primary way that the story is told is through highly produced in-engine cutscenes that can be altered by the player finding cosmetic items and equipping them before the story events starts; the player however has no other influence when it comes to

the narrative. Outside of minor cosmetic changes, the player slowly gains new abilities over time that allows them to access new areas, as well as items that modify the combat.

Fig. 15 - Screenshot taken from the video game Star Wars Jedi: Fallen Order, by Respawn Entertainment [Respawn Entertainment 2020].

The combat in Fallen Order is very much lifted from a series of video games that is known to be hard, which is the Dark Souls series [FromSoftware 2011]; as a result of this there is also a relatively large skill ceiling that the player has to overcome in order to complete it. This could be one of the key factors that may be the reason for why there is close to a 40% completion rate difference between this and Firewatch. Seeing as *story* is the primary reward system that is meant to keep the player engaged and if the player does not get to see the story because they are not good enough to overcome the skill barrier, they might quit as a result.

Based on the analysis that was done when comparing the these two video games, there might be alternate reasons for why they have such a large discrepancy between them; as such I am updating the final problem statement to include the question of what the likely reason would be for a player to quit a video game permanently; as it may be related to the story content or some other unknown factor.

4. Final Problem Statement

Based on the theory analysis that has been done thus far, I felt that it was necessary to update the initial problem statement to reflect the questions that have arisen and as such the new problem statement is as followed:

"How effective is storytelling as a motivational tool compared to other types of rewards when it comes to keeping people engaged and motivated while playing single player video games and what would make them want to stop playing a video game?"

There were also three additional questions that I felt could be interesting to look at, as they are somewhat connected to the *Final Problem Statement* to a certain extent; however in order to not overload the established problem statement, I decided to not include them and add them as additional questions to the questionnaires that will be a part of the project:

- Why do people play video games and how do they rate their overall quality?
- What are peoples' preferred ways of consuming story content?

These questions will allow me to assess why people play video games and how they perceive the overall quality of them; given the fact that the completion rates of the above mentioned video games are so low, there might be an issue with the overall quality of what is being produced on the current and last generation of video game consoles.

5. DESIGN AND IMPLEMENTATION

Given the central themes that this thesis project revolves around, which is how important storytelling is compared to other types of rewards and its relevance within the world of video games, a list of requirements were made before going into the design phase of the project:

- The prototype must include the theory discussed in the research chapter; this includes evaluating every decision made during the design process with the help of the previously mentioned frameworks.
- The prototype must contain multiple forms of rewards, which can take the forms of either story content or gameplay modifiers.
- The prototype should be narrative-driven and aspects from the analyzed video games in the *State of the Arts* chapter should be taken into consideration when coming up with gameplay ideas for the prototype.
- Due to the nature in which the prototype is going to be tested, the design of the prototype should include every possible form of communication in the game that will allow a player to play through the entirety of the prototype without the need for assistance.
- The player should also be able to play and complete the prototype, regardless if they've ever played a video game before.

There is also a list of personal requirements that has been formed based on past failures and experiences from previous projects that I have worked on in association with AAU CPH and DADIU:

- The overall end product of the prototype should not take longer than 10 to 15 minutes to complete, as it may have an adverse effect on the interest level of the player, given how the prototype is more than likely not going to be on a quality level compared to high end video games.
- Due to the nature of how long the video game must be, the difficulty of the prototype cannot fall into the category of being extremely difficult, as the player is essentially playing through what could be considered the opening part of a video game.
- The prototype should contain a fair amount of actions that the player can perform, as simply walking around in an environment may not be entertaining for most people.
- The prototype should contain some presence of AI, either in the form of friendly or hostile non-player characters, in order to make the game world feel less empty.
- The design aspects of the prototype should contain ideas that are relatively unique; this could be a setting that is rarely used in video games or how content is presented to the player.
- The prototype should convey a sense of scale similar to that of a complete video game experience to hide the fact that the overall experience itself should only take roughly 10 to 15 minutes to complete.
- There must also not be an ending to the story after completing the prototype, as it might have an effect on how much the player would want to continue playing if they had the option to do so.

The fact that I am only one person working on the implementation of the prototype, there are going to be certain shortcuts that have to be taken in order to produce something that can resemble that of a video game; this includes outsourcing needed assets, which will either come from the *Unreal Engine 4* store,

which is the video game engine that will be used for this project, or assets that were made freely available through various websites that I cannot make myself. I chose to utilize the Unreal engine [Epic Games 2021], as it is the primary video game development tool that I have used since the start of my Master's degree when it comes to producing prototypes.

Due to the amount of work that was done when it came to the creation of the prototype, this chapter will only focus the major aspects of what was designed and implemented; the less important aspects of the design process can be found in the appendix, which will take the form of a game design document that I created while attending DADIU.

5.1 BRAINSTORMING AND STARTING THE DESIGN PROCESS

By being aware of the abovementioned requirements, I decided to start out with a small brainstorming session, where I looked at what I initially had available to me when it came to 3D assets, as I at the time had no preconceived notion of what kind of story I wanted to implement into the prototype or what genre and game mechanics it should have. At the time of the brainstorming session, I found out that *Uppercut Games*, which is responsible for the single-player video game *City of Brass*, had released a fair amount of production assets from said video game [Uppercut Games 2017]. This led to the idea that I could create something that is located in the Middle-east, as *City of Brass* took place in an Arabian setting. With this initial idea in hand, I decided to look at different mythologies and stories from that region of the world, which could help me with forming a basis for the prototype's narrative. An additional design goal that was born from the brainstorming session was that I wanted the gameplay, narrative and world to be inspired by the chosen setting and the gameplay mechanics had to adhere to the rules of the game space.

While researching the various mythologies and religions, I came across the *Book of the Dead* [Allen 1960]*,* which is essentially a collection of texts that contained spells and magical formulas that would protect the dead, as they moved into the afterlife that was used in ancient Egypt. This felt like an interesting concept to start off with; the only issue at this point was the fact that my initial decision to use the building assets from *City of Brass* couldn't be done due to the fact that there were major architectural differences between ancient Egypt and the Arabian world, which resulted in me only being able to use the monster assets. At this point in the design process, I made the decision to keep the Egyptian setting despite the previously mentioned issue; in the end, the assets that were used for the prototype were photogrammetry models provided by *Quixel* [Quixel 2021] and a collection of other *Epic Games* asset packs that were available for free.

Now that I basically had all of the assets that were needed for the setting, I slowly decided to form the narrative based on the guidelines that I had set for myself. Seeing as I wanted to incorporate the enemy assets from the *City of Brass* asset pack, which basically all looked like mummies, I decided that the overarching narrative should revolve around the idea that undead monsters were brought back to life due to a disturbance within a tomb they were buried in, with the primary goal of preventing anyone from stealing the treasures that belongs to their long dead pharaoh who was buried alongside them. This narrative decision also made sense from a historic point of view, as there have been cases of Egyptian retainers sacrificing the servants of pharaohs, so they could serve their master in the afterlife [Galvin 2005]. This type of narrative felt very reminiscent to that of old monster movies, which prompted the idea that I could make the visual aspects of the prototype appear as if the player was in an old movie from the 1930s with the help of post-processing effects to make the screen grainy like old film and it would also

solve the problem of having to color correct all of the assets to make sure that there is a visual cohesion between them, as all of the textures on the 3D models could be converted into black, white and gray with the push of a button.

When it came to the creation of the main character, which is controlled by the player, a decision was made early on to have it be a "blank slate" [Bossche 2008], which basically means that it is a silent protagonist with no notable characteristics or deep backstory. This was done partially due to the fact that it would reduce the workload when it came to the actual implementation of the narrative into the prototype and it also allows a player, regardless of gender and ethnicity, to project their own identity onto the character.

A potential problem that could arise from utilizing this type of storytelling, is that the player might subject themselves to perceiving that there is some level of narrative paradox in the story, as the actions they are performing as the player might not accurately reflect what they would do in that situation. In reality, some people might sit by their car and hope that someone would drive by, others might not want to help the people in the camp after discovering that they might end up inserting themselves in a dangerous situation.

There was also an initial concern of how it would be possible to effectively, within less than two minutes, tell the player how and why they were in the situation that they are in, as well as providing them with a high level of ludonarrative consistency moving forward into the gameplay portion of the prototype. After looking at the different options that was available to me, I decided that the best way to accomplish this task was to create a small video in the form of a cutscene, as it had the potential to do everything that I needed it to do, without me having to utilize any form complex implementation methodology within the video game engine in order to achieve a similar result.

5.2 DESIGNING AND IMPLEMENTING THE OPENING CUTSCENE

A general limitation that I have when it comes to working on something like a cutscene, is that I have very limited skills within the world of 3D animation and 2D was not a desired option, as it could take way too long to create something that might not potentially work. This resulted in me coming up with the idea of using real life footage to convey the visual aspects of the game world. Given the self-imposed time limit that I created previously, I looked at the different ways people have used short videos to convey information to a potential viewer base. As a result of this research, I came with up the idea that the cutscene could be presented to the player in the form of a travel commercial [Bovee & Arens 1992], as these types of videos generally tells the viewer something about a specific location and their primary goal is to entice the viewer to visit said area.
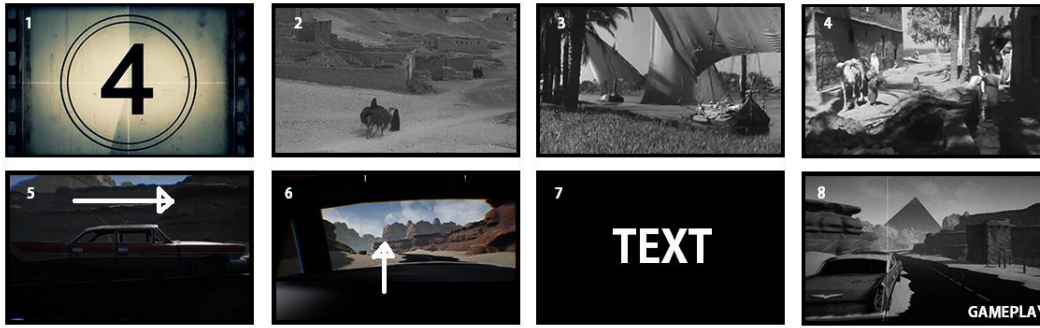
Fig. 16 - The initial storyboard used to sketch out the story for the opening cutscene.

After coming up with the general story idea for the cutscene, the next step I took was to create a small storyboard, in order to get a general overview of the sequencing of events that I needed in order to make sure that every narrative element was implemented correctly. The end result as is illustrated in the figure above shows a total of 7 scenes that eventually leads to the start of the gameplay portion of the prototype. The first segment of the storyboard, which includes the first four scenes, is all meant to be the commercial part of the cutscene, which contains a non-diegetic monologue playing over them with classic music in the background. The latter half of the storyboard contains video clips from the prototype, which shows the playable character, after being enticed by the commercial, now driving on a road in Egypt. When the story reaches the point where text appears on the screen, the player is told that their car has broken down and they now had to find help in order to get it fixed; this event eventually bleeds over to the story elements that were previously mentioned in this chapter. After reviewing the first iteration of the video, I decided that the cutscene needed more explicit story related context for why the player was in the car, which was not there previously; this resulted in adding additional text screens between the car scenes that told the player that their character was enticed to travel to Egypt based on the commercial, the car breaking down and a final screen that tells them to get help before the prototype starts. This was specifically done to remove any potential confusion from the side of the player.

When it came to the implementation of the cutscene, I started out with the auditory part of the monologue, which was created with the help of a text generated speech program that was heavily modified with the help of different high and low pass filters at 8000 hertz, while amplifying the audio between each pass. The goal of using the filters was to try and emulate the way that audio from the era between 1930 and 1960. The reason why audio during this time period sounds differently compared to what we are used to today, is a byproduct of limited frequency responses [Feucht 1990]. The same filter passes were applied to every bit of audio that is present in the prototype, to make sure that the player would be subjected to a uniform auditory experience. The written part of the monologue was created by studying the speech patterns that people used in publicly available commercials that were aired during the 1950s in the United States; the reason why I chose to use this methodology was because of the semiotic expectations that was needed to sell the illusion that the commercial could potentially have been recorded during that time period, as the way they spoke back then was slightly different compared to the way we speak today.
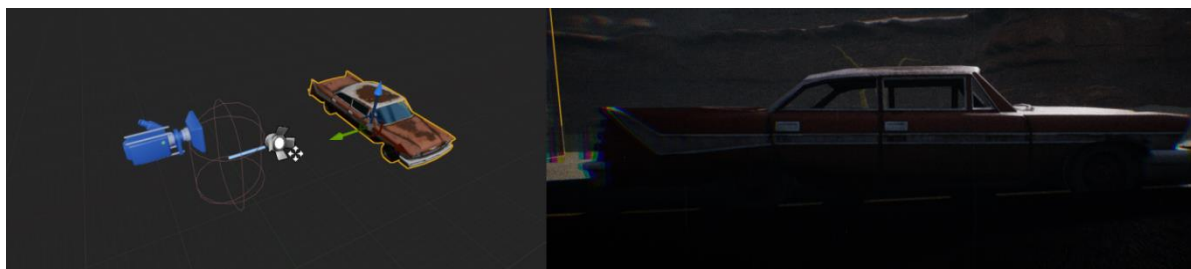
Fig. 17 - Illustration of how the model was attached to the camera (left) and what it looked like without filters enabled (right).

When it came to creating the latter half of the cutscene, which included in-game footage, I came up with the idea of attaching the car object that was going to be a part of the story to the player camera, as is shown in the figure above. This meant that I could basically emulate the effect of a car being driven around by moving the playable object at high speeds within a project scene. The area that I used to record the movement of the car took place in the first level, as it already had all the set dressing and visual effects that I needed to create a video clip of a car driving on a road. After everything had been recorded, the only thing that was missing before compiling the video was the fact there was no auditory feedback from when the car moved, broke down or when the player exited the car within the cutscene. In order to create these effects; I scoured the internet for the individual noises that would be needed in order to achieve what I needed to happen on an auditory level within the cutscene and strung them together in a sequence that I felt would work within the context of the game world. The final version of the cutscene can be found in the online appendix.

5.3 DESIGNING AND IMPLEMENTING THE NARRATIVE

Seeing as I have already written about how some of the narrative elements have been implemented, this subchapter will contain an overview of the entire story and how it was told with the help of the theory that has been outlined in the *Related Research* chapter.

The following narrative elements were created based on the structure outlined in the narrative framework:

The characters – The overall narrative has 3 different main characters which are a part of the prototype in one way or another. The first one is the playable main character that is a blank slate for the player to inhabit while playing and experiencing the story. The second is an American archeologist who was named Edgar Holmes, based on combining names from random archeologists that lived in the era that the prototype takes place in and the third character is a man named Saad, who is working with Edgar as a guide for the area. Saad is also the leader of a small workforce that is helping them excavate the temple ruins. Due to the limitations of what I had to work with and the time it took to implement the story into the prototype, the player does not meet the other two characters during their gameplay experience and they are only able to observe the aftermath of the interactions between the characters.

The setting – The entire story takes place in Egypt somewhere between the years of 1930-1960, as it was inspired by monster movies from that period. The player also gets to visit a long forgotten tomb under the temple that they find in the first level.

The plot – The general plot for the story is that the player, who decides to visit Egypt on vacation, ends up with a broken down car in the middle of the desert. In order to get out of this predicament, they have to find help. After finding potential signs of life in what appears to be an abandoned camp, the player is prompted to venture into a temple.

Conflict(s) – The main narrative conflict that appears in the prototype is that Edgar and Saad uncovers an artifact that was found from an unknown tomb beneath the temple. This artifact however, appears to be cursed and as such Saad's men slowly become sick. Edgar wants to continue the excavation while Saad is actively against it, at some point during the night, Edgar wakes up to a loud noise that sounds like someone is breaking into his tent, and he discovers that Saad's men has slowly turned into what appears as zombies; he then proceeds to shoot the person invading his tent and flees with the artifact into the temple. Saad, as a result of what is happening to his men, wants to take revenge against Edgar and he decides to follow him. Granted none of this is actively told to the player and they are only experiencing the aftermath of the conflict, with the goal of having them piece this information together themselves as a part of the narrative experience.

Resolution – due to the fact that the video game is in fact just a prototype, means that there is no real ending for the player to experience. This is also an intentional choice that was made, as it could potentially have an effect on the desire of the player to continue if they completed the entire narrative, this assumption was made after reviewing the initial results from the online questionnaire, where people said that they would quit a video game with no intention of going back if they perceived that they had completed everything a video game had to offer them.

The general flow that the narrative had when it came to the final version of the prototype was that the player would be given key informational details between each level in the form of cutscenes. Alongside the key information, a lot of additional story elements were created and scattered around the levels, which is completely optional for the player to interact with, in order to make the game world feel less empty and it would also allow me to tell a story that is a little more explicit in case the player is unaware of the desired semiotic connections between the visual elements that is shown to the player.

If we look at the concept of ludonarrative theory by Hocking and compared it to the prototype, it is possible to conclude that there is a high level of ludonarrative consistency in the prototype, as the narrative of the player being lost and alone is mirrored in the gameplay.

As was analyzed in the *Related Research* chapter, I concluded that there were a number of ways that information could be conveyed to the player and as such I used all of the types that were mentioned with the hopes of optimizing the quality of the overall story:

- **Cutscenes** – The player is given a cutscene at the start, which is meant to tell them what is happening at the beginning of the prototype and it also establishes the primary narrative goal. Two additional cutscenes were added between the levels, to give the players who were less inclined to seek out the narrative information for themselves, some context for what could happen moving forward.
- **Audio** – When it came to the implementation of audio, I decided to implement two audio logs, one per level, which tells a one-sided narrative from the perspective of the archeologist. An alternative idea that I had during the production, was to create an actual narrator that would

provide the player with information about certain elements within the game world. However that idea was killed off early on due to the text to speech software that I intended to use was randomly removed by the author who created it.

- **Reading** – There are certain areas where the player is given text that they can read about a specific story element; for example, in the archeologist's tent, there are artifacts that was taken from the temple and when the player walks up to them, they would be given information through text, as it was too hard to convey the information through visuals alone.
- **Environment** – There is a fair amount of environmental storytelling within the prototype, as it was very easy to implement.
- **Interactive events** – There is only one event in the prototype that could be considered to be interactive and that is when the player is sent to the afterlife, where they have to interact with a scale that will allow them to resurrect themselves in order to get back to the second level.

Every narrative structure that was mentioned in the *Related Research* chapter is represented in one way or another through the various elements in the prototype and it was done for multiple reasons. The main reason for why I wanted to implement multiple types of structures was to challenge myself by having to deal with different narrative problems and finding solutions to them. The other reason was that I felt it was necessary to give the player different forms of narrative content, seeing as I, when creating the prototype, had no real idea of what type of storytelling methodology was preferred by the participants who eventually took part in the experiment.

5.4 AI DESIGN AND IMPLEMENTATION

One of the main elements that I really wanted to have implemented into the prototype, which is based on the feedback I got during the 7th and 8th semester projects that I worked on, was that a basic level of AI should be included as a part of the gameplay, because it would make the game world feel more alive. As was mentioned in the *Brainstorming* subchapter, I decided based the assets that I had available to me, that I wanted to use the undead characters from the *City of Brass* asset package, as they came with a series of premade movement animations, which made it easier to implement into the prototype, as I do not possess the necessary skill to make my own. In order to make the AI move within the level, a navigation mesh had to be placed into the desired area and a basic amount of coding, created with the help of the Unreal Engine 4's *Blueprint Visual Scripting,* had to be applied to the enemy AI, as is illustrated in the image below; this allows them to walk on any surface that is connected to the mesh, they cannot however by default walk through, under or over any object that are larger than themselves.
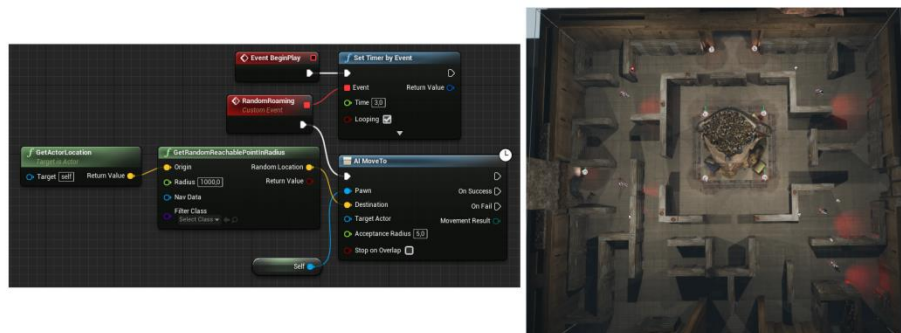

Fig. 18 - The code used for the enemy movements (left) and the layout of the maze (right).

The coding illustrated above basically states that when the game starts, a delay timer ticks down from 3 seconds before the AI is allowed to move. When movement is allowed, the AI picks a random path within its radius and then it starts to move in that direction. This event loops constantly until the level is over, the player dies or gets detected within the AI's cone of vision. If the AI detects the player, another piece of code takes over, that tells it to move towards the playable character.
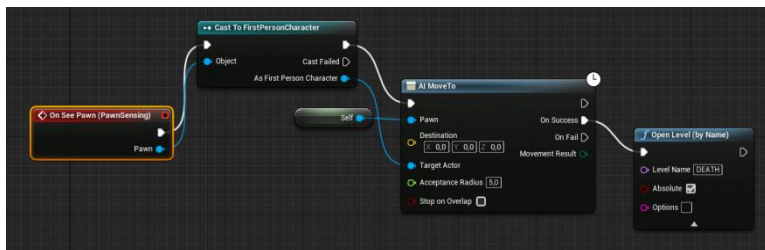

Fig. 19 - The code used for the enemy "attack".

If the AI catches up to the player and touches them, the event opens up a new level, which is the *Death* realm that the player has to escape from in order to get back to the land of the living; this event only happens once and after the player gets back to the entrance of the maze again, they are loaded into a different level, where the AI's coding is slightly different, as it now just sends the player back to a checkpoint by using the same coding methodology. If the player were to escape the AI's vision cone, the enemies will stop pursuing them and return to their normal routine. The reason why I decided to design the AI the way that I did, was because I felt that having standard movement routines, where they would move from point A to point B, made them predictable and uninteresting; the randomness in the path system creates a more unpredictable and chaotic behavior, which in turn also makes it slightly harder to get through the maze if the player decided to only use the ground to navigate on. The idea of having the AI sending the player into another level was done to make the general implementation easier, as I did not have to create an entire health system for a gameplay segment that might take 1 minute to complete.
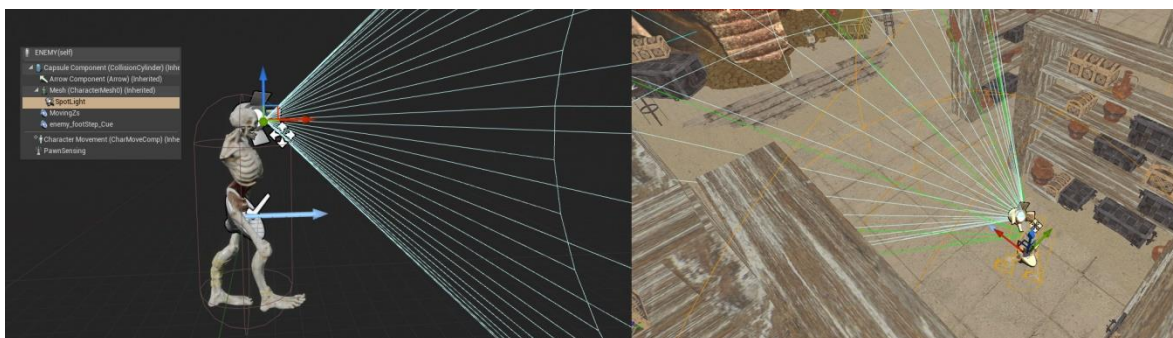

Fig. 20 - Illustration of the enemies 'sensing cone' as seen in the editor (left) and in the level (right).

Additional steps were taken to make the overall experience when encountering these creatures more pleasant; as a part of the AI's design, I decided to add a spot light that is connected to the enemy model's head, which is used as a visual feedback system for their field of vision, that allows the player to know what the enemies are looking at in any given moment. I also added multiple audio cues that allow for auditory feedback when the player cannot see the monsters while moving around in the dark. The audio cues themselves, which are also connected directly to the model, had their attenuation overwritten.

5.5 LEVEL DESIGN, FLOW AND STRUCTURE

Many of the design ideas for the three levels that can be found within the final version of the prototype shared the same methodology that was used to create the overall design of the story, where I looked at what I had available to me; I then proceeded to place some of the models into a scene that had nothing but a large landscape that was covered in a sand material. It is also worth noting at this point that the level design was being created at the same time that the story was being formed. The reason for why I chose to do it this way was because I knew from the start that if there was something that was impossible for me to implement into the prototype, the idea would be immediately dropped and an alternate solution would have to be found. An example of this would be, if I had no way of creating something that looked like realistic sand for the player to walk on, then I would not have the game world of the prototype be in a setting that had sand in it; the same thought process guided every major decision related to the prototype. Due to the limited amount of assets I had to work with, I came up with the idea of kitbashing 3D models together in order to create something new out of them, as I knew that was a viable strategy from having worked as a level designer when I attended DADIU, where I had to create custom house models out of simple squares. By combining, reshaping and rotating a handful of objects that normally wouldn't fit together, as is seen in the figure below, I was able to create the temple that is a prominent part of the introduction level.

Fig. 21 - Screenshot taken from the first level in the prototype.

Normally when designing levels for video games, a level designer would start out with creating a greyboxing scene [Barlet 2009], which is a process that allows them to get a general idea of layout of a level before going into production. Given the limited amount of time I had for the implementation of the prototype and the assets that were available to me, I basically had to skip this step and use the finished models to build the levels from the start, while still taking the layout into account. Another major issue that I had while coming up with ideas for the layout of the level, was the fact that I had no initial concept art to work from, so in order to create what I ended up with; I used photo references from actual temples in Egypt.
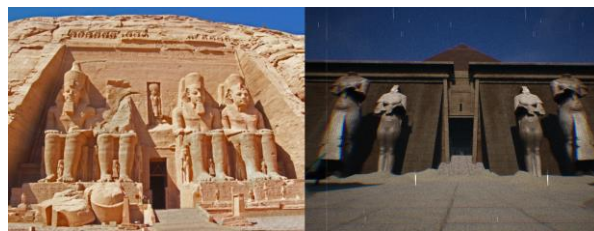

Fig. 22 - An illustration of how real Egyptian architecture (left) inspired the layout for the prototype (right).

Originally, the courtyard for the temple was twice as long as it ended up being in the final version, but it was reduced in order to remove a lot of the empty spaces and I also wanted to reduce the travel time for the player when they had to move from one area to the next. When I got to a point where the travel time between objectives felt just right, I started to populate the entire courtyard with photo realistic statues, monoliths and camping equipment. The general idea for the story at this point in the process, was that a rich American archeologist had hired a bunch of poor locals to help him with scavenging the remains of the temple, with the hopes of finding hidden tombs filled with treasure. This shaped the visual themes of the environmental narrative as it is shown in the figure below, where the archeologist had a massive tent for himself, that contained a lot of large frivolous items that normally wouldn't be suited for camping in the wild, and the locals were confined to their own area with small tents and an open campfire to keep them warm.

Fig. 23 - Screenshot taken from the first level in the prototype (temple courtyard - ground level).

As it was mentioned previously, the entire prototype consists of three different levels and they are all contained within their own separate scenes that the player transitions between while playing. The first scene, which takes place in a linear environment, is meant to teach the player about the overall structure of the prototype's game mechanics.

Fig. 24 - Screenshot taken from the first level in the prototype (top-down).

As the player enters the level after having watched the opening cutscene, they start at the upper left corner of the map, as is illustrated in the figure above, where they then move from one small tutorial area to the next. At this point, the player is given a minor tutorial about basic movement through the user interface that tells them how to move around, control the camera, as well as running, jumping and crouching.

The first gameplay task that the player has to deal with, which is given through the cutscene, is that they need to find help in order to get out of the situation that they now have found themselves in. At this point

in the level, the player is not told where to go and the reason for this decision is because there was a desire to evoke the emotion of feeling lost, like a stranger in a foreign land; granted, the level is not that big, but the player does not know that when playing the prototype, as steps were made to fill out empty spaces in a way that made the world appear bigger than it actually is. In order to guide the player, two very noticeable 'weenies'[2] were placed into the scene, which takes the form of pyramids as is seen in the figure below, that is meant to guide the player from one area to the next. The reason for why I chose to guide the player with the help of the environment, instead of just telling the player where to go, was that I knew from the video games that I produced while attending DADIU, which dealt with environmental navigation, that designing the environment to tell the player where to go is more fun and engaging for the player, rather than giving them the solution through other means like a compass or user interface notifications.
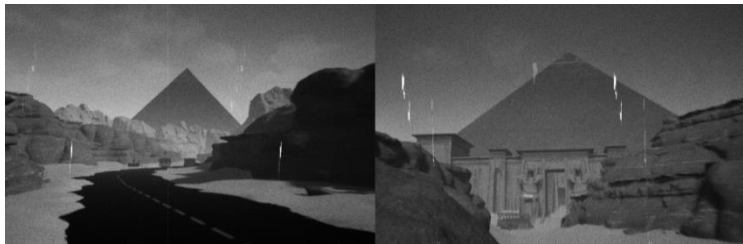

Fig. 25 - Example of how the weenies look like in the final version of the first level.

As the player enters the second tutorial area, which is the courtyard of the temple, they have the option to search through the abandoned camp to discover what might have happened to the people who owned the equipment. This area is meant to teach the player how the story is conveyed to them and it also sets the narrative up to be bigger than just finding a way out of their predicament, as they now have to find the people who are missing in order to get the help they need. Through the help of environmental storytelling and semiotic design clues related to the narrative, the player is led into the temple, where they find their first gameplay modifying reward, which takes the form of a flashlight that helps the player see through the darkness within the temple; this is yet again, meant to be a tutorial that teaches the player how they will find future upgrades while playing. Inside the temple, they will find the exit that leads to the second level and when they enter the event trigger that is location is this area, they will be given a cutscene similar to the first one, which provides them with narrative information before they are loaded into the next area.

Fig. 26 - Examples of what the interior looks like within the temple.

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[2] Walt Disney's term for a visual element that could be used to draw people into or around a space [Coons 2015].

As the player finds their way into the second level, armed with the knowledge of what they potentially could expect moving forward in terms of gameplay and narrative structure. The difficulty increases by a relative amount, as they now have to deal with monsters that can hurt them. When they first enter the level, they are treated to a whole new and grim visual aesthetic, which is meant to convey a sense of danger, as the majority of the level is shrouded in darkness and human remains. As the player moves forward from the starting area, they come across what could be considered mass graves, inspired by the concept of servant sacrifices which was previously mentioned, and they take the form of pot burials [Brunton & Caton-Thompson 1928], which were something people in Ancient Egypt did to some extent upwards of 3500 years ago, which should give the sense that this place is very old.

Fig. 27 - Example of how real events inspired the visual aesthetics of the second level [Brunton & Caton-Thompson 1928].

The reason for why I chose to display the graves in this manner was done for multiple reasons. The first and primary reason is that it felt very eerie to look at from a visual standpoint, seeing dead human beings stuffed into large pots, which was the desired feeling that the scene is meant to evoke within the player and it also allows them to imagine that every pot is filled with remains even when the lids are closed. The second reason is that the technical cost of inserting a pot into the scene, is far more beneficial than using skeletons in terms of performances, as the pots themselves have far fewer vertices and triangles, which helps with the overall quality of the prototype.

As the player moves further into the level, they suddenly hear a sound that they have not yet heard before, that is coming from behind what is meant to appear as a locked gate. As they move closer, with their flashlight in hand, they will discover that there is in fact an undead creature behind the bars.

Fig. 28 - Screenshot taken from the second level in the prototype (tutorial area).

The reason for why this element is a part of the level, is because it is meant tell the player that they are no longer alone, unlike in the first level and it is also designed to teach the player, in a non-threatening environment, what the enemies within the level sound like, as the creature behind the bars is constantly moaning and grunting, and it cannot hurt the player while doing so. One of the key elements that I learned about enemy design while attending DADIU, is that auditory feedback systems are one of the most important types of feedback that enemies needs to have if you want to avoid unfair gameplay design, as it allows the player to use auditory cues, that will help them when it comes to reacting to a potential threat that is not visible to them while playing. The specific example that I am using as a reference comes from the second mini-game that I worked on at DADIU, which had multiple enemy types that were confined within a maze-like urban environment space and their only goal was to attack the player who only had one health point, which meant that if they got to the player, the player would basically lose the game. None of the enemies within the final version of the video game, due to a lack of proper management, ended up having easily identifiable audio cues attached to them, despite requesting it as a part of the game design, which meant that the people who played the video game would sometimes randomly lose without knowing why. As such, I felt that implementing this as a type of tutorial before the player encounters a hostile AI was paramount when it comes to providing them with a good gameplay experience.

After encountering the first passive enemy, the player will be given their second gameplay modifying reward, which takes the form of a rope that allows them to grapple up to ledges. The upgrade itself is placed in such a way that makes it impossible to miss, as it is being illuminated by a flashlight, which makes it stand out even more. The fact that there is a flashlight in the area allows the player to understand the fact that someone was here relatively recently, as flashlights aren't supposed to be in old tombs and it was still operational.

Fig. 29 - Screenshot taken from the second level in the prototype (rope tutorial area).

The area that the player now finds themselves in, as is illustrated in the figure above, is the tutorial area that is meant to teach the player how to use the rope, as they enter, they are given a prompt from an event trigger that is coded in to the prototype, that tells them exactly how to use the rope and it is quite clear from how the room is structured, where the player should grapple to in order to move on, as there is a visual marker in the form of a rope located on the edge of a ledge located above them, which shows where the player should go. When completing the tutorial, the rope is available for use in the entire level and is meant to be used to solve the problem they will encounter as they move on to the end of the prototype.

Fig. 30 - Screenshot taken from the second level in the prototype (maze – ground level).

The final area, which is by far also the most difficult, is the treasure chamber that is filled with the sacrificed servants of the pharaoh, whose visage is depicted in the middle of the room, and their narrative reason for being there is to prevent people from stealing his treasure. The entire room is designed to be a maze, where the AI enemies run around freely without any coding restraints like forced path systems; they are however bound to that specific area for gameplay and technical reasons that will be explained in the subchapter dealing with the implementation of the AI. The maze itself, as is shown in the figure above, is not what one could call a traditional maze, as the player has the option to pass through the bottom shelves in some areas and they can also, if they are smart enough, use the rope to grapple on top of the shelves themselves; they are also able to see through them to a certain extent to make it as easy as possible for the player to know where the enemies are within the level. The design idea behind making the maze like this came from watching videos of rats trying to cheat their ways through mazes by jumping over walls in order to get to the end faster and I felt that if the player was smart enough to figure out an alternate solution to this puzzle, then they should be rewarded by thinking outside the box by making the area easier for themselves. If the player were to get caught by the AI, they will be transported into a third smaller level, which is directly inspired by the *Book of the Dead*, as the player, from a narrative sense, has entered the afterlife to be judged, the player then has to weigh their heart on a scale next to a feather, in order to see if they are worthy of being resurrected.

Fig. 31 - Screenshot taken from the 'Death' level in the prototype.

The concept of resurrection is not a part of the *Book of the Dead* and was specifically added to the narrative of the prototype, as I needed a way for the player to return to the world in a more interesting way than just having them press a button after being treated to a screen that told them that they died. This event will only happen once per gameplay session and if the player were to get killed again, they will start at a checkpoint right before the entrance to the maze.

Fig. 32 - Screenshot taken from the second level in the prototype (the exit to the second level).

Once the player gets past the AI, they will find themselves at the end of a small corridor that, when entered, will trigger a cutscene that then be sent back to the main menu.

5.6 LIGHTING DESIGN AND IMPLEMENTATION

Lighting plays a large part when it comes to that of the level design and gameplay within the prototype, as it helps the overall moods within the game space and it is also used to guide the player in more ways than one [Houze 2019]. The setup for the lighting itself is relatively simple, as it primarily utilizes static diegetic and non-diegetic light sources that are baked into the scene. When it comes to guiding the player with the help of light sources, especially in the first level, a directional light was placed in such way that it would illuminate the entrances within the temple grounds with the hopes that it would help guide the player towards the end of the level; An additional *Sky Light* object was added into the scene in order to reduce the shadow intensity from the directional light, making it easier to see objects hidden in the shadow, as can be seen in the image below.
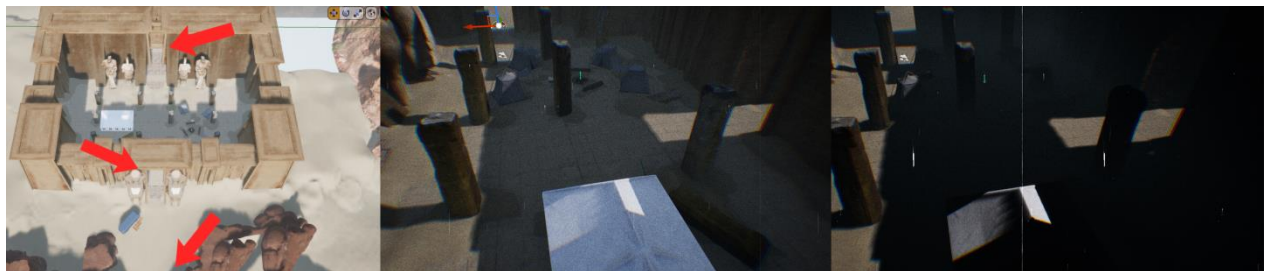

Fig. 33 - Illustration of how light is used to guide the player (left) and how light is used in the level (middle and right).

The use of light to guide the player is a common technique used by level designers, as was illustrated in the *Semiotic Design Framework* subchapter, where a flood light was used to point towards the only way forward. The reason for why light is used in such a way is a byproduct of how we as humans perceive our surroundings when it comes to central and peripheral vision. Our central vision, which is the first thing we focus on when observing an object in an environment, within the context of lighting critical areas and objects within a game world, should contain all of the necessary information that allows a person to understand the importance of illuminated areas; peripheral vision is used to give context and validate what is being perceived by the central vision [Houze 2019].

Fig. 34 - Example of how light was used in the prototype (contrast was increased for the sake of the report).

When it came to lighting the enclosed spaces within the second level, I decided after reviewing a version that only contained diegetic lighting in it, which consisted of a handful of braziers and a flashlight on the ground, that it was too dark in the rest of the level and it made it harder to navigate through it. As a result of this discovery, I decided to solve the problem by inserting a series of non-diegetic point light sources into the level, which illuminated the areas to make the surroundings relatively easy to perceive, without completely negating the need for the flashlight to be activated at all time as is illustrated in the image below, which for the sake of this report, was altered to make its content more visible.

5.7 UTILIZING SEMIOTIC DESIGN THEORY

The main reason for why I created the semiotic design framework was so that I could evaluate the work that I did objectively on a semiotic level within the context of the previously established framework, as this type of theory does not appear to be in use when it comes to modern video game design. As previously mentioned, the framework seeks to allow a designer to study the various elements that could be implemented into the design of certain features and the game world, in order to communicate certain aspects of a video game more clearly to the player in a structural format that would be similar to both the *Saussurean* and *Peircean* traditions. The overall intent for the prototype, from both the gameplay and visual perspective, was to provide the player with an experience of being in an old movie set somewhere between the years of 1930-1960 that was located in Egypt. This meant from a gameplay standpoint, that the prototype would not be allowed to provide the player with any types of diegetic gameplay modifying rewards that weren't available during that time period. When it came to trying to emulate the visual screen effects that movies had from that time period, which consists of visual artifacts that would indicate that singular or multiple frames have suffered damage in one way or another, I utilized a complex post processing tool built into the game engine, that included a fair amount complex mathematics involving sinusoids and textures.

Fig. 35 - Example of visual artifacts in old movies (left) and in the prototype (right).

In order to tell the player that they were in Egypt, solely based on the visual elements alone, I decided to implement cultural symbols associated with the location, which most people with a basic understanding of the area would be able to know on a semiotic level; this included pyramids, Ancient Egyptian architecture, cultural references and artistry.

If one were to analyze the visual aspects of the game world that is a part of the prototype on an academic level, they would likely find many different flaws if they had any basic knowledge of Egypt and its architecture and culture, as the assets themselves, especially the 3D scanned ones, are taken from various periods of Egyptian history, which would cause some levels of dissonance when trying to nail down the period in which the video game prototype takes place. This is a byproduct of having been forced to use what was available to me, as I did not have access to content that was specifically made for the time period that the prototype takes place in. A specific example that I want to use in order to illustrate this issue can be seen with the pyramids that appear prominently in the first level.

Fig. 36 - Example of what the pyramid looks like in the prototype (left) and in real life during the 1930s (right).

In the image above, we can see the implemented 3D asset on the left and an image taken of a pyramid from the 1930s. As we can see when studying the two images, it is quite clear that there is a difference between the two. The 3D asset is cleaner and has no defects unlike the real version from the desired time period. This would indicate that it is relatively new by comparison, as it still also has a pyramidion, which is the uppermost piece of an Egyptian pyramid, attached at the top of it.

Whether or not this is going to have an effect on the player is highly subjective; it depends on what they are willing to accept the game world as is and their knowledge of the signs in question. They could potentially see the pyramids and get 'pulled out' of the game similarly to how *Ludonarrative Dissonance* is described and the opposite effect would be that they don't care about it at all. However, seeing as there was no real way to test if this is a legit issue before the testing of the prototype, it is still a thing that should be taken into consideration.

5.8 UTILIZING RATIONAL GAME AND LEVEL DESIGN

When it came to utilizing RGD theory, I decided, due to the fact that the implementation wasn't that complicated in terms of game mechanics, that I wanted to try and use the theory in a slightly different way when it came to tuning the enemies that can be found exclusively in the second level. Due to the myriad of ways that the player can tackle this section of the video game and the fact that all of the gameplay is meant to be relatively easy, I chose to use the RGD data that I had to make my own custom difficulty, as I felt that the established difficulty, based on internal testing, was a little too easy. As a result

of this, I decided to look at the different categories and take what I felt might benefit the gameplay experience, rather than just simply making everything feel trivial.

	ATOMIC PARAMETERS	EASY	MEDIUM	HARD	CHOSEN DIFFICULTY
PRECISION SKILL	*Size of enemy on screen (Attack)*	Almost full screen (90%)	60% of the screen	30% of the screen	Almost full screen (90%)
	Enemy Speed on screen	Slow Speed (Slow-walk)	Medium speed (walking)	Fast speed (Running)	Medium speed (walking)
TIMING SKILL	*Enemy predictability*	Predictable (moves in 1 direction	Alternation (Way path movement)	Chaos (unpredictable)	Chaos (unpredictable)
	Enemy Idle	6 seconds	3 seconds	0 seconds	3 seconds

Tab. 4 - The final tuning of the enemy characters within the prototype.

As can be seen in the categories above, I chose to make it so that the enemy characters have to be within a very close range in order to attack the player, where they basically have to cover 90% of the player's screen before anything happens. I chose to give them a medium speed, which is the equivalent of normal walking speed, as the player is capable of easily using the rope or running away from the monsters if they felt like it. The paths that the monsters take are completely random and this was done so that the player wasn't able to predict their behavior, which would hopefully keep them more engaged in what was happening in front of them. The enemies idle after each movement for a certain amount of time and I chose 3 seconds for the delay timer, as it didn't feel completely unfair or boring.

When it came to the distribution of the content within the prototype, the main goal was to make it as evenly distributed as possible between the first two levels, as that is the area where the player spends the majority of their time.

LEVELS	Level 1	Level 2	Death (Level)
ABILITIES			
Movement + Camera Control	Introduction	x	x
Jumping	Introduction	x	
Running	Introduction	x	
Crouch	Introduction	x	
Enemies			
Undead		Introduction	
REWARDS			
Flashlight	Introduction	x	
Grapple Rope		Introduction	
Story Content			
Cutscenes	Introduction	x	
Audio Logs	Introduction	x	
Text	Introduction	x	

Interactive Content		Introduction

Tab. 5 - The final distribution of content within the prototype.

As can be seen in the figure above, most of the content is introduced to the player in the first level, which is intended to be the tutorial area for the entire prototype; all carry over to the second level, where two new elements are introduced to them as well. If the player dies, most of their abilities will be taken away from them in that specific level until they get resurrected; this was done so that the player wouldn't want to spend a lot of time in that level, as it is very small compared to everything else.

5.9 FRAMEWORK ASSESSMENT

As a part of this project, I decided that I wanted to utilize different types of previously established academic game design frameworks to assess the work that I did in relation to the prototype, in order to make sure that the gameplay experience could be as ideal as possible, as there was very little to no time when it came to tuning and changing any element that could potentially make the overall experience feel bad or mediocre.

The *Serious Game Design Assessment* framework, which was elaborated upon in the *Related Research* chapter, established by Mitgutsch and Narda seeks to assess the individual elements that make up a video game to make sure that it is fulfilling its purpose with a high level of cohesion. Granted, it was designed to assess serious games, which the prototype isn't, but I have over the last couple of semesters used it to assess whether or not the design decisions that were made for different projects fell into the category of being holistic. After reviewing the final version of the prototype, I came up with the following assessment:

The purpose that the prototype seeks to provide the player, is that of a narrative experience with multiple types of rewards set in a world reminiscent of old monster movies with a story and environment set in Egypt, that could fall into the category of being horror, or at the very least somewhat scary given the themes that are presented to the player. Given the restraints of the testing requirements, the gameplay experience has to be relatively easy, as the player is playing through what could be considered to be the opening 10 minutes of a video game; this also means all of the information that is presented to the player has to be easy to understand as well. The goal of the mechanics was to try and mirror reality to a certain extent when it came to how the player moved around the world and interacted with it. When it comes to the rewards, the player is given rewards that could be intuitively understood based on their semiotic context, based on realistic tools that can be used for navigation and traversal. The ***mechanics*** that can be found in the prototype in terms of rules and rewards very much mirrors a realistic portrayal of what a person could do in real life, despite some of the more mystical elements. The ***narrative*** of the prototype shares the same themes and genre that one can expect from old monster movies. ***The visual aesthetics*** of the prototype, despite the semiotic flaws listed in the next chapter, promotes a feeling of old-fashioned movies through the use of post-processing filters and an environment that is completely monochrome; the content within the levels are also an attempt to make the world appear as if it was set in the 1930s. The previously mentioned elements are the key factors, based on observational data, which make the aesthetic experience appear similar to that of older movies. When it comes to ***framing and content*** in the prototype, one can make the statement that the play literacy is low, as the player is not subjected to any form of complex information or actions while playing. When the prototype was first conceived, there was

an initial desire to target a mature audience, who would be aged 18 and above; this is due to the likelihood that most of the people who are going to be playing the prototype, were more than likely going to be in that age category.

Based on the assessment of the prototype, which was done objectively in order to remove any form of personal biases, I can conclude that the overall game design could be considered to be holistic, as there are no noticeable elements that sticks out; granted, there might have been something that I could have forgotten when looking at the various elements that the prototype consists of.

When analyzing the contents of the prototype through the lens of the MDA framework, created by Hunicke Et al.; the general vocabulary that can be used to describe the 'fun' elements that is a part of the prototype, according to their framework, I concluded that the following aesthetics were the best descriptors for it:

- **Fantasy/Discovery** – The player gets to explore a fantasy world they would likely never be able to get to in real life.
- **Narrative** – The prototype is narratively driven and it is one of the primary forms of rewards that the player is given from completing basic actions within the game world.
- **Sensation** – The experience that the player would get from playing the prototype is relatively unique from a video game perspective in its visual and auditory aesthetics, which depending on the player can either be something that draws them in or makes them less likely to want to continue.

When we look at the different game mechanics and diegetic gameplay modifying rewards, it is possible to conclude that they are supplementing the above mentioned aesthetics, as they enhances the player's ability to discover new places with the help of illuminating from the flashlight and they can explore new areas with the help of the rope.

6. METHODS

Seeing as the primary goal of this thesis project was to find an answer to the following problem statement:

> *"How effective is storytelling as a motivational tool compared to other types of rewards when it comes to keeping people engaged and motivated while playing single player video games and what would make them want to stop playing a video game?"*

I decided to use two different methodologies, both containing questionnaires to collect data, in order to potentially find some semblance of an answer that could provide a proper inference when it comes to the question at hand. The first approach consisted of me creating an online questionnaire that covered all of the bases that is required by the problem statement, which is how effective is storytelling as a motivational tool in video games and what would make a player potentially stop playing a video game, that was meant to be sent out on the internet for anyone to answer. After multiple attempts of finding the best possible questions, with supervisorial assistance, I came up the idea of creating three categories that would form the basis for both questionnaires:

- **Demographics** – This category allowed me to assess who is partook in the testing phase of the project, in terms of age demographic, gender, why they play video games and how much time they normally spend playing video games in a given week.
- **Player Motivation** – This category looked at the participants' preferences in terms of reward types, the likelihood in which they would complete or stop playing a video game and their feeling when it comes to not wanting to continue.
- **Story Preferences** – This category was centered on the participants' preferences when it came to storytelling in a general sense and how they like to consume storytelling within the format of video games.

The questions themselves are available in appendix and the answers to said questions will be elaborated upon further as we move towards the end of the report. The second methodology that was going to be used in order to find an answer to the problem statement consists of utilizing the prototype that was created alongside this report. The test itself contained a questionnaire that is similar to that of the previously mentioned methodology, with some minor alterations to some of the questions that made them centered on the prototype instead of being general questions. The prototype covered most of the requirements set by previously discussed theory, with the exception that it lacked two types of reward structures being *Performance Review* and *Achievements*, which was a result of those two types of reward systems being hard to implement into the prototype and making them work as a part of the game design. In order to solve this issue, both *Performance Review* and *Achievements* were added as possible answers to the question related to reward types, just in case the participants felt that they really wanted to use either of those as answers to their primary forms of motivation. The goal of the prototype itself was that it was going to be used as a proxy for a video game that was created with modern video game design theory; once the player completed the prototype, they were then asked to fill out a questionnaire before the test would end.

6.1 DATA COLLECTION

The information that was going to be collected through the two experiments consisted of data points that were by design both quantitative [Bryman 2012] and qualitative [Pertti 2020]. The goal with the qualitative questions was to allow the participants to answer questions that are more complex, yet completely optional and anonymous, that would then be analyzed in order to get a general understanding of the participants' playing habits and preferences. The purpose of the quantitative questions was to form ordinal data sets, with the help of *Likert* scales [Rensis 1932], which would allow for an overall understanding of the participants' opinions towards certain video game related topics. The structures of both questionnaires were very similar, as they dealt with trying to understand which demographic that the participants belong to, their gaming habits and perception of story in video games. The only element that was different between the two questionnaires is that one was trying to find a more generalized answer to the problem statement, which was labeled as '*Online Questionnaire'* in relation to this project, and the other was designed to address the same problem from a different angle, which could also be seen as an assessment of modern game design theory and its effect on storytelling. The reason for why I chose to do it this way, was because I felt that simply just doing one type of test, which would normally be the one related to the prototype, might not be sufficient enough to address the problem statement, as it may be subject to a list of potential biases and issues that could render the entire experiment null and void. By having a second data set that is less likely to get corrupted by the aforementioned issues, will also provide a more solid answer to the goal of this entire project, which as previously mentioned, is meant to look at how relevant storytelling is in relation to video games.

6.2 PARTICIPANTS

The individuals who participated in the online questionnaire and the prototype experiment were selected through the use of non-probability convenience sampling [Saunders & Thornhill 2012], as the goal was to try and find people who were actively willing to participate in either test. The potential biases that could have arisen from using this methodology, was that the people who were willing to participate, might not have been the ideal participants if they don't care about the subject matter in question, despite deciding to participate in either experiment. When it came to the recruitment of participants for the online questionnaire, I actively tried to find public forums on the internet, where people would openly discuss video games at different competence levels in order to hopefully get a varied pool of participants. When it came to finding individuals who would be playing the prototype, I chose to use participants who I was more acquainted with in a general sense, considering the fact that they have to be willing to jump through some extra hoops to participate, as they have to actively download the prototype and play it, which makes their participation take longer than just filling out a questionnaire that would take less than two minutes to complete.

The sample sizes for both tests were uncapped, with the goal of trying to get as many people to participate as possible. The only real requirement that the participants needed to have was a basic understanding of the English language, as the questionnaires, as well as the prototype, were only available in said language. The reason for why there were no limit to how many people could participate in either test was a fear of the fact that the final sample sizes would not be large enough to yield any valid results, as there is an estimated 2.9 billion people who play video games in one form or another according to different statistics [Lynkova 2021].

6.3 EXPERIMENT SETUP, EQUIPMENT AND TESTING PROCEDURE OF THE PROTOTYPE

Given the time that we are finding ourselves in with the outbreak of COVID-19, the testing of the prototype was conducted remotely over the internet, where participants used their own hardware to play the prototype and due to how it was implemented; the participants were required to use a keyboard and mouse as peripherals. This methodology was chosen out of necessity and could also, depending on certain factors, be considered to be the most ideal way to play the prototype, as the participants were playing the prototype from the comfort of their own homes, which is generally how video games are consumed. The negative side effect of doing an experiment like this is that there will not be a uniform experience between all of the participants, as they could be subject to a host of potential problems and distractions, which may have an effect on the way that they answer the questions in the questionnaire. The entire process, which was estimated to be roughly 10 to 15 minutes, based on the assessment of the prototype, was divided into three separate phases:

- **The first phase:** Every participant was given a verbal list of instructions related to how the experiment would be conducted and they were told that they could ask for help if they get stuck or have issues related to the prototype.
- **The second phase:** The participants play the prototype.
- **The third phase:** Once the participants were done playing the prototype, they would be required to fill out the questionnaire before the test is over.

When it came to making the online questionnaire available for people over the internet, I decided that the best approach was to create a post on a given forum that told anyone who read it that I was a student associated with *Aalborg Universitet København* and that I was in process of trying to find people who were willing to participate in an online questionnaire related to video games and storytelling, that was completely anonymous, while also thanking anyone in advance for participating. Anyone who commented on the post also got a personal thank you message, with the hopes that more people would want to participate from seeing the interactions. The message was as followed:

"Hello everyone!

I am a student at the University of Aalborg in Denmark that is currently in the process of doing a project related to player motivation and storytelling in Single-player video games. I am currently in the process of trying to find people who are willing to take a minute or two out of their lives to partake in a small online questionnaire that is completely anonymous.

If there is anyone here who would be willing to help in this endeavor, it would be highly appreciated. Here is the link to the questionnaire:"

Seeing as the goal was to get as many people to participate as possible, I also made a conscious decision to make the post wasn't using any form of academic language that was hard to understand.

7. RESULTS

The following chapter contains all of the answers given by the participants who participated in both the questionnaire (n = 334) and the prototype (n = 13). The results will be further elaborated upon in this chapter.

7.1 QUESTIONNAIRE RESULTS

The participants who took part in the questionnaire were, as previously mentioned, acquired through online means and the type of people that was actively targeted were individuals who played video games, at the bare minimum, as a hobby, which meant that they played video games regularly in their spare time for pleasure. I actively avoided trying to find participants who were extremely casual, meaning the type of person who might play one or two video games over the period of a year or potentially play a couple of hours per week. This was done because of the likelihood that people who are actively engaged with video games on a consistent basis, have a better grasp when it comes to their preferences and understanding of the medium.

Despite having spent a fair amount of time trying to make every question easy to understand, some of the participants gave answers that were either irrelevant to a given subject matter or was a variation of another possible optional answer that was given to them. As a result of this, the variation answers were merged with the optional pre-made ones and any answer that wasn't constructive was removed from the data pool.

7.1.1 DEMOGRAPHICS RESULTS

The following subchapter looks at what type of people who partook in the online questionnaire (n = 334) and the prototype (n = 13). There were a total of 6 questions that sought to identify rudimentary information such as gender, age in relation to the participants and why they played video games.
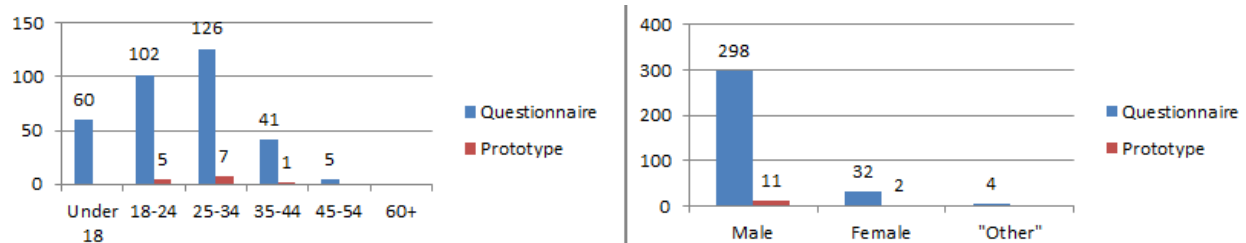

Fig. 37 – *The following graphs contains the data related to the questions: "How old are you?" (left) and "What is your gender?"(right).*

As we can see from the participants in the online questionnaire (n = 334), the vast majority fell within the age range of 18 to 34, with the vast majority being male and the remaining 9,6% consisting of women and 0.2% identified as "other". The category of "Other" was included in order to allow people who, for their own personal reasons, did not want to identify as one of the other two categories. There was a similar pattern when it came to the prototype, where the participants fell within the same age range and they were predominantly male, with two females participating.
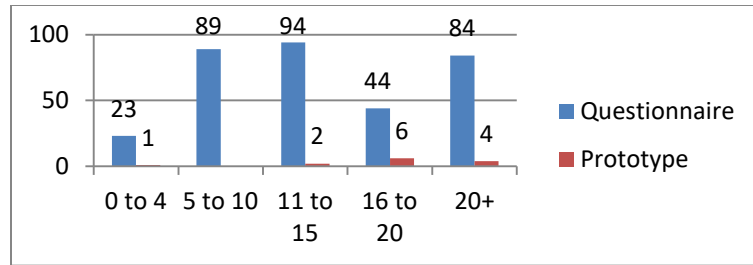
Fig. 38 – *The following graph contains the data related to the question: "In a typical week, how many hours would you say that you spend on playing video games?"*

It appears, based on the graph above, that most of the participants played upwards of 11 to 20+ hours per week. This would give an indication that the people who partook in the tests had a relationship with video games that went beyond that of what one could consider to be casual players, which for this project was set at 0-4 hours per week. This means that the participants, who partook in the questionnaire, could potentially be the ideal subjects for this test.
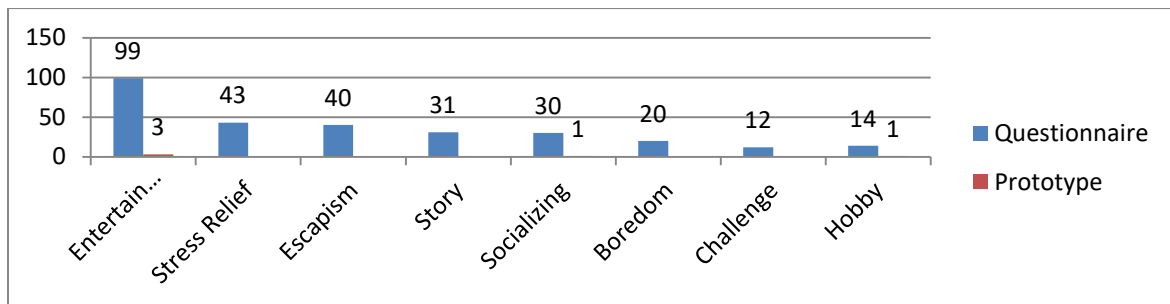

Fig. 39 – *The following graph contains the data related to the question: "Why do you play video games?"*

The graph for the question "Why do you play video games?" had its answers converted from text to numerical data [Bjørner, 2015], as it made it easier to assess the 294 answers that were given for this specific question by both groups. The categories were chosen based on the participants' word usage and there could be a potential overlap between them, seeing as playing a video game for the *story* could fall into the category of *Entertainment*, as the story itself could be considered to be entertaining. The definition for each of the categories is as followed:

- **Stress relief** – Some of the participants stated that they used video games as a form of stress relief from real life situations.
- **Challenge** – There were 12 participants in the total pool of participants who stated that they played video games to challenge themselves when it came to their own skills.
- **Entertainment** – This data point includes answers related to the concept of "fun", as the definition of entertainment can be defined as the act of being provided with amusement or enjoyment.
- **Story** – This is a category that was created specifically because people chose to write sentences such as "I play video games for the story", which can be, as previously mentioned, overlapped with entertainment, but it was separated due to the frequency in which this word was used.

- **Socializing** – When it came to the concept of socializing, the participants would often use sentences like "playing with friends", which encompasses the concept of participating in social activities or mixing socially with others within the confines of a video game space.
- **Escapism** – Some participants specifically used escapism as a motivation to play video games, which is a tendency to seek distraction and relief from unpleasant realities, especially by seeking entertainment or engaging in fantasy.
- **Boredom** – There were also a handful of participants who stated that they simply play video games because they were bored with real life.

Granted, if someone else were to sit and evaluate the answers that were given to this question, it might look different to a certain degree, but I felt that the chosen categories fell within an acceptable range for why people play video games on a daily basis. As we can see from the answers given to this question, the reason the participants played video games is primarily because they find them entertaining. Some participants chose to cite multiple reasons for why they played video games and that data were split between the categories.
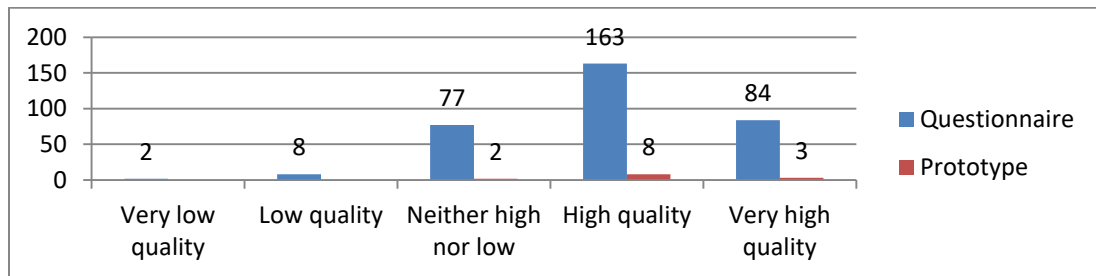

Fig. 40 – *The following graph contains the data related to the question: "When looking at the video games that have been released over the last 10 years, how would you rate the overall quality of them?"*

I specifically asked the question of what the participants felt of the overall quality of video games that were released over the last 10 years based on what was discovered in the *State of the Arts* chapter, where there was a consistent issue in which people did not complete the video games that they played, and my perception was that quality could potentially have been a quality issue. However, based on the answers that were given, we can see that the participants, which is based on their perception of the quality of video games over the last 10 years, that the majority felt that the overall quality was either high or very high.

There was also a desire to understand what type of player the participants were, which is why the following question was created and it is based on Nick Yee's *Gamer Motivational Model*:
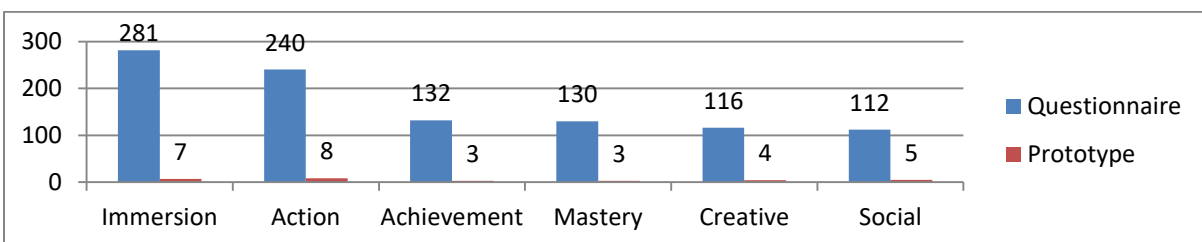

Fig. 41 – *The following graph contains the data related to the question: "What type of player are you?"*

Given how people could potentially identify as more than one type of player, it was decided that this question should have the option to pick more than one answer in order to get a more accurate answer to the question. Based on the observation of the graph, one can assume that the majority of participants identified themselves as either *Action* or *Immersion*, with the potential of some of them being a combination of both, as each category had more than 240 answers, despite the fact that there were 347 participants in total.

7.1.2 PLAYER MOTIVATION RESULTS

The following subchapter looks at the gameplay motivations of the people who partook in the online questionnaire (n = 334) and the prototype (n = 13). There were a total of 4 questions that sought to identify information such as the participants' reward type preferences and why they might end up not completing video games that they are playing.

As we can see in the next graph, which was only available to the online questionnaire participants, which was centered on why a participant would want to start playing a video game, it is clear that the primary reason is directly tied to the story, followed up by gameplay modifiers. It is worth noting that this question allowed the player to choose multiple options, as there might be a combination of more than one reason for why they would start playing a specific video game.
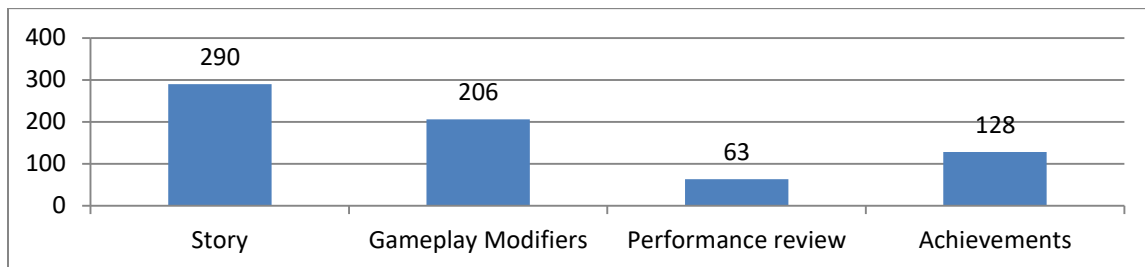

Fig. 42 – *The following graph contains the data related to the question: "Which of the following reward types motivates you to start playing a video game?"*

The next graph was related to a question that was only in the prototype questionnaire, and it asks the participants to state which reward type was their most preferred while playing and as we can see, there are similar results to the graph that is associated with the questionnaire.
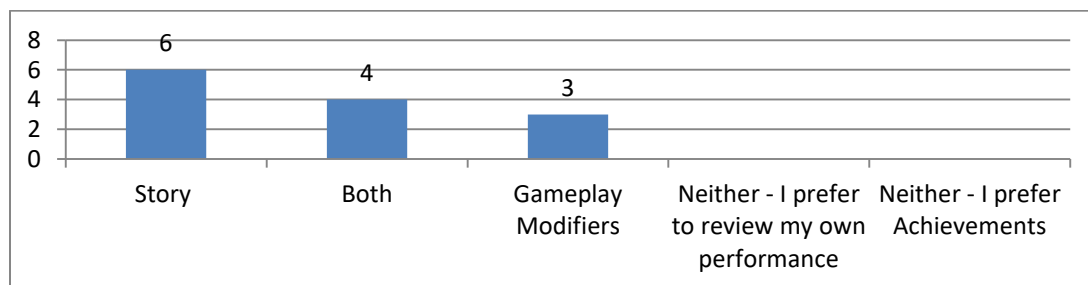

Fig. 43 – *The following graph contains the data related to the question: "Which of the following reward types kept you motivated while playing the prototype?"*

Based on the information that was discovered in the *States of the Arts* chapter, which looked at the overall completion rates of video games, I decided to include questions that asked how likely a person might be when it came to completing a video game. As we can see in the graph below, the vast majority of the participants completed most, if not all, of the video games that they played.
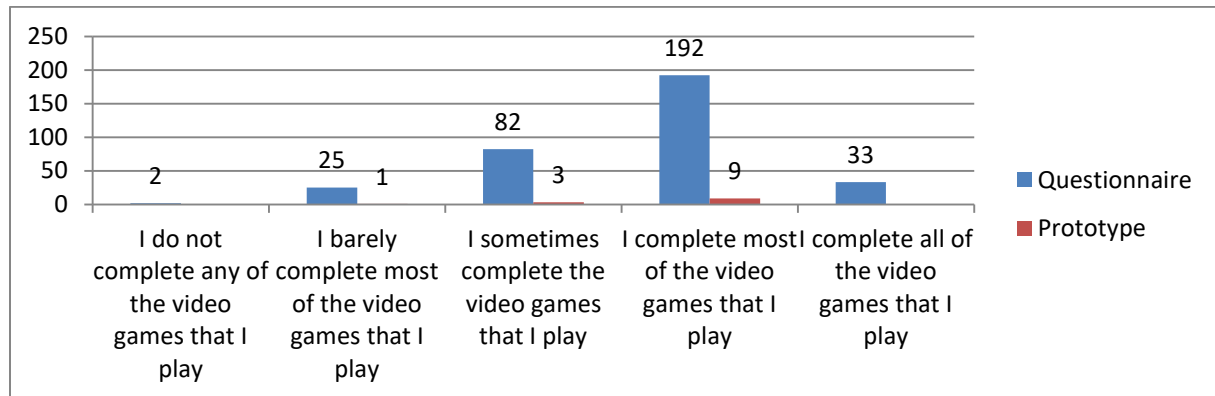

Fig. 44 – The following graph contains the data related to the question: "How likely are you to complete the video games that you play?"

This could potentially mean that the target group that was initially undesired, which was casual players, could be connected to the low completion rates of story-centric video games. Granted the sample size for this project is not big enough to make any conclusive statements on the subject matter.
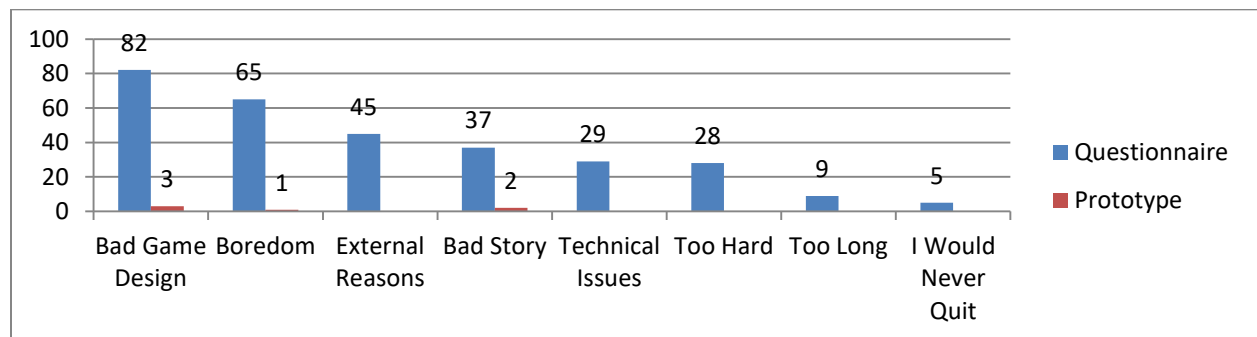

Fig. 45 – *The following graph contains the data related to the question: "What would be the likely reason for why you would want to stop playing a video game permanently? "*

The graph for the question related to why a person might quit playing a video game permanently, as is illustrated above, was directly tied to the quality of the experience itself. This graph was given the same treatment as the "Why do you play video games?" question, as the participants had free reign to answer whatever they liked; as a result, the same issues occurred and some answers had to either be removed or merged into a specific category. The definition for each of the categories is as followed:

- **Technical Issues** – This category was created by finding out that there are participants who would outright quit a video game if they encountered certain types of technical issues that caused them to have a negative experience, such as corrupted save data or similar issues.

- **Bad Game Design** – The idea of what could be considered to be *bad game design* is very much subjective and it depends on the participants' perception of what game design is. For the sake of this project, we could make the assumption that it is directly related to concepts like unintuitive design choices made by developers for their video games. This data point is very vague, as the participants did not elaborate on what they meant by *bad game design*.
- **Bad Story** – Some participants indicated that one of the likely reasons for why they would quit a video game is because they felt that the quality of the storytelling was bad.
- **Too Difficult** – There were quite a few who cited that they would quit a video game if it was unfairly difficult, which could result in them not physically being able to complete a video game they were playing.
- **Too Long** – Some participants have experienced cases where some video games felt too long, which resulted in them not wanting to continue past a certain point.
- **Boredom** – Some participants specifically mention that they would quit a video game if they felt that it was boring regardless of quality. I specifically did not merge *Boredom* with *Bad Game Design*, as they are not mutually exclusive, despite the fact that one could argue that bad game design leads to a boring experience.
- **External Reasons** – This category was created, as there were quite a few who had external reasons for why they would quit a video game regardless of quality. This included new video game releases and reasons related to real life obligations.
- **I would never quit** – There were a handful of participants who claimed that they would never quit a video game regardless of quality or potential technical issues.

If we look at the answers on the graph, we can make the assumption that the primary reasons for why the participants would want to quit playing a video game would be a direct result of bad game design and feeling bored while playing. It is worth mentioning again that if someone else were to go through all the answers, the graph might change slightly in terms of categories and distribution of answers. The participants were also asked how they felt about not completing a video game if they had a tendency of not completing video games and the answers can be seen in the graph below.
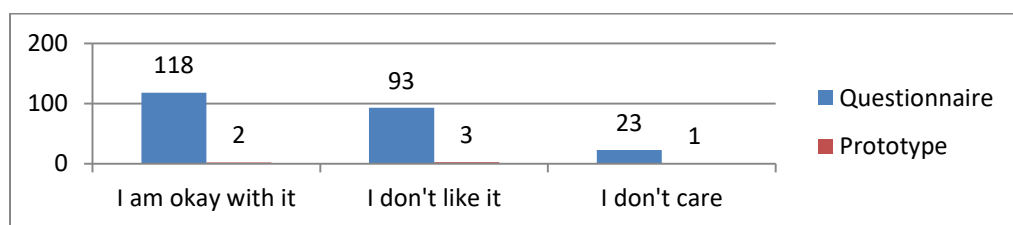

Fig. 46 – *The following graph contains the data related to the question: "If you have a tendency to not complete the video games that you play, how do you feel about it? "*

When taking a cursory glance at the data from the graph related to how the participants felt about not completing video games, we can conclude that the majority of the participants were okay with the idea of not completing a video game, with a close follow-up of 96 participants not liking the idea that they did not like the idea of not playing a video game through to completion. It is worth noting that this question had similar issues with people providing answers that did not directly relate to the question, so some of

them had to be discarded and the rest merged into one of the three options that can be seen in the above mentioned graph.

7.1.3 STORYTELLING PREFERENCE RESULTS

The following subchapter looks at the storytelling preferences of the people who partook in the online questionnaire (n = 334) and the prototype (n = 13). There were a total of 4 questions that sought to identify information such as how important storytelling is for the test participants in general and their preferences when it comes to how stories are told through video games.

The following graph shows a clear indication that the participants of both tests rated the importance of storytelling in video games to be very high, as the Likert scale goes from 1, which means that storytelling is not important at all, to 5 which is very important.
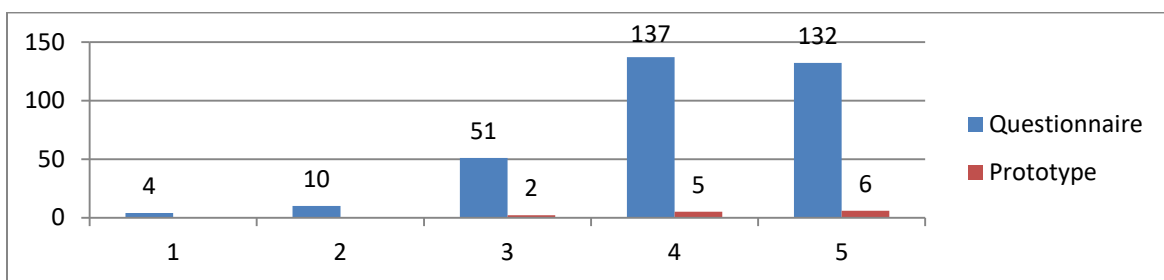

Fig. 47 – *The following graph contains the data related to the question: "How important is storytelling for you in video games?"*

When comparing the collected data with what was discovered in the *State of the Arts* chapter, which was that the completion rates of highly rated and well-reviewed video games, where story was the primary motivational tool, had so. Granted, it could be that the test participants aren't a part of the group that don't complete video games, despite the fact that close to the majority of the participants were okay with quitting video games before completing them.

Fig. 48 – *The following graph contains the data related to the question: "How likely are you to complete a video game solely because of the story content?"*

The graph above, and below for that matter, are centered around the participants desire to continue playing a video game solely because of the story content, this means that they are will to do something that they might not actively enjoy in order to see the story through, which is an indication that storytelling could be considered a powerful motivational tool when it comes to a players continuation

desire. It is worth noting that the graph below is only related to how likely a participant would want to continue playing the prototype and the data is not related to their general preference, as is shown in the graph above.
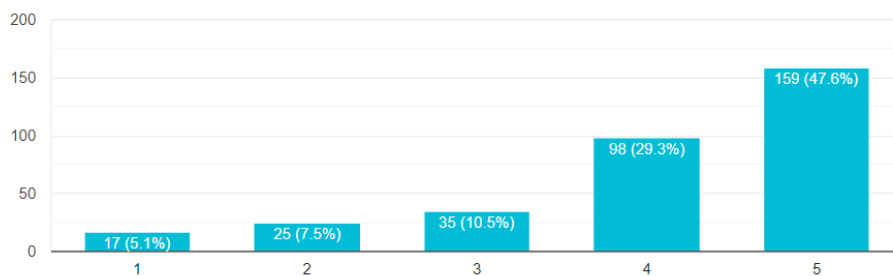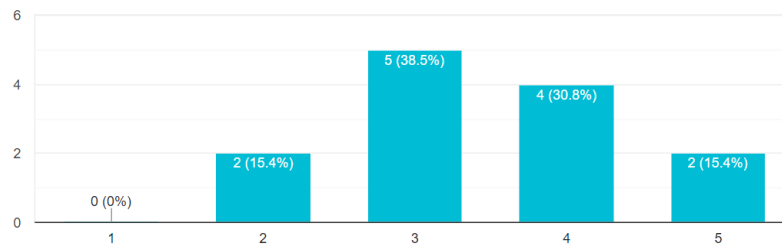

Fig. 49 – *The following graph contains the data related to the question: "How likely are you to continue playing the prototype solely because of the story content?"*

The following two graphs do not directly relate to the problem statement, but I still thought it would be interesting to understand people's preferences when it came to the type of genre that they preferred to consume story content. It is quite clear from the results that *Action-adventure*, *Role-playing* and *Action* were some of the most dominant genres.
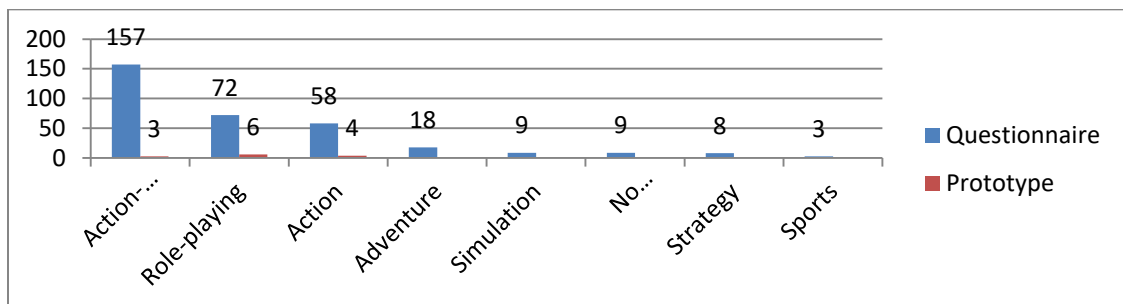
Fig. 50 – *The following graph contains the data related to the question: "Which of the following genres do you prefer to play when playing story-based single player video games?"*

The methodologies that the participants mostly preferred when it came to the how story content is presented to them, takes the form of cutscenes, followed up by interactive events and environmental storytelling, which means that the most dominant ways that they prefer to experience content is either through video or events where they themselves are active participants in the narrative, as both *Interactive Events* and *Environmental* could be considered to interactive forms of storytelling.
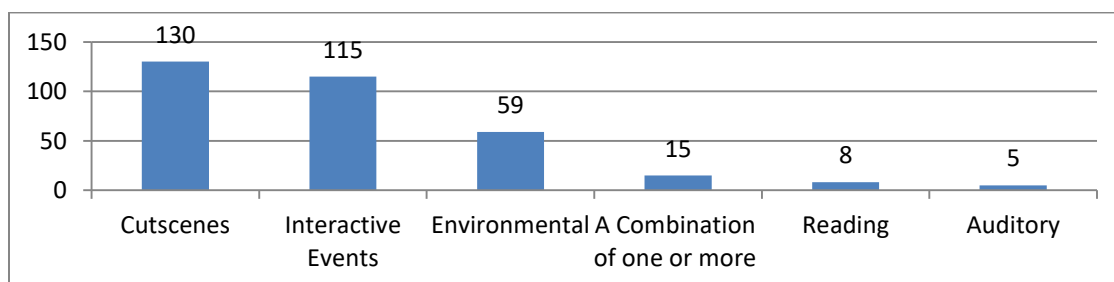
The following pie-chart is only related to the prototype and it assesses the storytelling methodologies that were used for the narrative. It is clear that the majority preferred environmental storytelling.
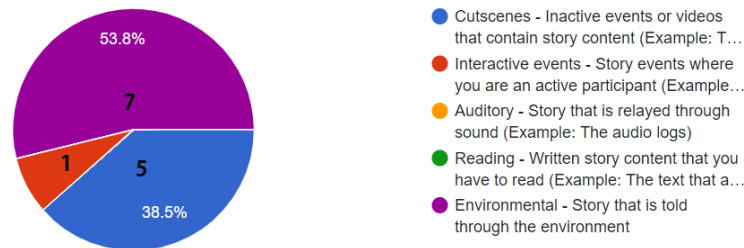
Fig. 52 – *The following pie-chart contains the data related to the question: "While playing the prototype, which of the following* storytelling *methods did you prefer?"*

There was sadly a mistake that was done in relation to this specific question and that was the fact that the participants did not have the option to pick multiple answers like was done in the previous graph. According to the results, the majority found that the environment was the most preferred storytelling methodology, followed by the cutscenes.

8. DISCUSSION

In the following chapter, the results from both tests will be discussed in relation to the final problem statement, which sought to discover the following:

- What is the most important type of reward that motivates players and keeps them engaged while playing video games?
- What would be the likely reason for why a person would want to quit playing a video game?

There will also be a discussion about potential response biases in relation to the questionnaires, as well as a retrospective look at the project as a whole.

8.1 RESPONSE BIAS

When it comes to conducting experiments that heavily relies on the subjective feedback from a large group of people, which was done for this project, the data itself may be subject to different types of biases, which could have had an effect on the final results. I have created a list that should be taken into consideration when assessing the collected data:

- **Demand Characteristics** – This type of response bias may arise because participants are actively engaged in the experiments that they are participating in, to the point where they are trying to figure out the purpose of the tests are, or the participants may alter their own behavior and values in order to be perceived as "good test subjects", which is actively harmful when it comes to answering the questions in the questionnaire, which would result in invalid data.
- **Distractions** – Given how the tests were conducted online, the participants may have been subject to unwarranted distractions that could have had an effect on them while either filling out the questionnaire or playing the prototype, which could have resulted in less thought out answers to the questions given to them or a loss of immersion while playing.
- **Misinterpretation** – While answering the questionnaires, the participants may misinterpret a question that would result in them potentially giving an incorrect answer. Great lengths had gone into making sure that no special terminology was used when formulating the questions, in order to prevent the participants from either getting stuck or incorrectly understanding a specific question. It was clear, based on the collected data from both samples, that there were quite a few misinterpretations.

There could also be the possibility of the abovementioned list of biases not having an effect at all on the answers that are given by the participants, with the exception of the last one, but it would be naïve not to expect that certain factors may have an effect on how the participating individuals decide to answer each question.

8.2 INTERPRETATION OF THE RESULTS

When looking at the demographics data, we can conclude that the vast majority of the participants in both tests were males within the age range 18-34, where 34 of the participants, which came from a participant sample of 347 in total, were females within a similar age range and 4 individuals also identified as 'other'. The majority of participants generally spent upwards of 11 to 20 or more hours per week, which would give an indication that the people who partook in the tests had a relationship with video games that went

beyond that of what one could consider to be casual players, which was set to 0-4 hours per week and the reason why the participants played video games, was for the sake of entertainment and they generally rated the quality of video games from the last 10 years quite highly. Based on the observation of the graph associated with Yee's motivational model, one can assume that the majority of participants identified themselves as either *Action* or *Immersion*, with the potential of some of them being a combination of both, as each category had more than 240 answers, despite the fact that there were 347 participants in total.

When analyzing the *Player Motivation* data, we can conclude that the primary reason for why the participants would start playing a single player video game is directly related to the story, followed by gameplay modifying rewards; the results from the prototype experiment also shows a similar trend. Based on the information that was a part of the *States of the Arts* chapter, which showed that a fair amount of video games had low completion rates, the question of *how likely the participants would complete the video games they played* was also asked; it appears that the majority of participants completed most of the video games that they played, which could potentially mean that the target group that was initially undesired, which was casual players, could be connected to the low completion rates of narrative-driven video games. There was close to an even split between how they felt about not completing a video game, which was that they either were okay with the fact that they did not complete it or did not like it at all. The primary reason why participants would actively quit playing certain video games, is directly related to *bad game design*, which is arguable a little vague, as most people who answered this question did not elaborate further and only assumptions can be made for what this actually means, as it could be anything from poorly thought out controls to unintuitive UI elements to name a few. Other reasons included boredom and external reasons, which are more easily quantifiable.

If we look at the face validity and the results from a basic level of statistical analysis in relation to the question *How important is storytelling for you in video games?*, it is possible to conclude, based on the median value of 4 (out of 5), which can be used to measure the central tendency of value distribution, that the participants from both tests, thought that storytelling was very important to them when they played video games and they have also stated, based on the question of how likely they would complete a video game solely for the story, that they are willing to play something they might not like in order to experience the story. This suggests that story could be considered a powerful tool when it comes to keeping people motivated and engaged when playing single-player video games. The question related to how likely the players of the prototype was willing to continue solely based on the story was a little different by comparison, as the median value of 3 suggests that the participants were less likely to want to continue playing to experience the story, which could be a result of the prototype's quality not living up to their standards. When it came to how the participants liked to consume story related content, the vast majority of the entire sample pool (n = 347) chose *Action-adventure* as their preferred genre, followed up by *Role-playing* and *Action,* with *cutscenes* and *interactive events,* followed up by *Environmental Storytelling,* being the primary ways that they wanted story content to be experienced. When it came to the prototype in terms of what they preferred in terms of storytelling, the majority chose *Environmental Storytelling* as the most engaging element.

8.3 RETROSPECTIVE SELF-EVALUATION OF THE PROJECT

When I look back at how this thesis project was conducted in retrospect, there were a handful of elements that I would have liked to improve upon if I had the chance to do it all over again. Before going into what those elements are, I would like to address one consistent issue that has plagued the project throughout the entire semester. This problem, with no better way to explain it, is a constant lack of mental motivation and fatigue, which is a byproduct of having to work from home on a daily basis due to COVID-19. The exact same issue affected the 8th semester project that I worked on, which resulted in a performance that was worse than the previous semester in some aspects. When it came to this project specifically, there were days where nothing happened and every day felt like they were 5 hours long even while being awake for 16 or more hours. This resulted in failing to meet personal deadlines when it came to writing, the implementation of the prototype and testing. Another thing that I discovered about myself over the last couple of semesters is that I am far more motivated when working on something that I have a genuine interest in with people who share the same passion, rather than working on it by myself in isolation and working like this is not the ideal way for me to perform at my best.

When it comes to the overall quality of the project, it has certainly improved compared to previous semesters (7th and 8th), as a result of doing this type of self-evaluation as a part of each semester, in order to understand where I could improve upon in the future. When it came to the implementation of the prototype, the content that I made for this project far outshines what I created when I first started working on my master's degree, with implementations of complex features such as AI and a superior understanding of game design that allowed for overall better experiences, even though I fell back on some of the implementation ideas that I used from previous projects. There were also some aspects of the prototype, which was a part of the original design, had to be removed due to the encroaching testing deadline. These features consisted of a more interactive world, in which the player could interact with objects in a similar way to how certain video games allow for close up inspections of items within the game space. Another idea that was removed from the list of concepts that I wanted to implement, was that the player had a larger agency over the narrative, with their actions having a genuine influence on what was happening around them, with different levels that would only be accessible if they did something specific in the previous level. When looking back at these ideas in hindsight, some of them could potentially have lifted the prototype even higher in terms of overall quality; there is also the possibility that they could have caused issues in terms of consistency if the prototype became too big in terms of features.

Due to how the deadlines were constantly pushed, it resulted in me having less time to test the prototype, which meant that I got fewer participants than desired to test the final version of the prototype. The acquisition of test participants has generally been a consistent issue, based on my experience working on several projects with different Medialogy groups, which would generally result in most of the studies ending up with answers that could be considered dubious at times due to low sample validity. Knowing this in advance, I decided to try and do something else this semester, which was inspired by my supervisor's approach to his paper related to continuation desire, where he would interview a group of people with questions related to his research topic in order to get a general understanding on player behavior on a larger scale. Given how most people are working from home and a large portion of them browse public forums, wanting to discuss topics and express their opinions online, I felt that this was

potentially an untapped goal mine that could be utilized to achieve a similar result. By doing the testing this way also allowed me to get far better results than I ever would have expected.

In summary, I feel that I personally could have done a lot better than what the project ended up being, but based on objectively evaluating my own performance, I also felt that I had improved a lot since I started in the 7th semester.

9. CONCLUSION

The purpose of this study was to try and understand whether or not storytelling was a good motivational reward system in single player video games, given how trends have shown that these types of games have relatively low completion rates in certain cases. Based on the interpretation of the data that was collected through multiple methodologies in association with this project, it is possible to conclude that story content is in fact one of the most dominant tools that can be used to keep players motivated and engaged while playing single player video games, to the point where they are willing to do something they don't really care about in order to experience the story.

This data, when compared to other studies that has looked at player continuation desire [Schoenau-Fog, 2011], shows similar results, which could suggest a trend that potentially, to some degree, validates the data that was collected for this study; however, given the unknown validity factor, more data is required in order to make a definitive decision on the subject matter. There is also the possibility that gameplay trends may shift over time to the point where other reward types are more desirable to players in the future.

It is also possible to conclude, from the data that was collected, that the primary reason for why a person might quit playing a single player video game, would be a result of what they perceive to be a negative experience related to the game design. The vast majority of the participants, who could be labeled hobbyists, based on the amount of time they spent playing video games in a given week, stated that they completed most if not all of the video games that they played. This could mean that the low completion rates are tied to casual players; this is however only a speculation based on the given data.

It is worth noting that seeing as the sample size only consists of 347 participants in total, that if we were to sample another group of people from a different area of the world, there is a likelihood that the data might change in favor of the other reward types.

10. FURTHER RESEARCH

If anyone were to be brave enough to carry the torch forward when it comes to that of studying this subject matter, they should consider using a larger and more diverse sample size, which can include every possible player type. Some of the ideas that weren't implemented for the questionnaire when looking at the project in hindsight, were that there could be regional differences when it comes to how people play video games; this type of information could be valuable for companies trying to create a single player video game for a specific market. It would also be interesting to see if there are any differences when it comes to genders, as it is clear, based on the data collected by this study that it is primarily a hobby that is dominated by males.

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12. APPENDIX

12.1 DESIGN DOCUMENT

The following design document was used to structure the workflow when it came to the creation of the video game prototype and it contains an overview of the elements that were directly implemented. The design of the document was created by me when I attended DADIU and it contains some of the information that wasn't mentioned in the Design and Implementation chapter.

Game Overview

High Concept (Elevator Game Pitch)

Tomb of the Forgotten is a narrative-driven video game that was inspired by games such as *Tomb Raider* and Gone Home, as well as old monster movies from the 30s and 40s. The premise of the video game is to venture into a long forgotten tomb fraught with danger designed around real concepts that can be found in Egyptian mythology, after getting stuck in the middle of nowhere.

Storyline

The story of the video game starts with the player, who takes on the role of being a tourist, who gets stuck in an Egyptian desert while being on a vacation. In order to get out of their predicament, they'll have to find help. As they move further down the road, they find a seemingly abandoned camp, where it appears that a fight has taken place, this leads into a larger narrative where the player then has to figure out what happened and help anyone who might still be alive in order to get out of the situation they have found themselves in.

Due to the way that the video game prototype has to be structured, the story does not end when the player reaches the final level.

Characters, Names and Descriptions

Unnamed Protagonist – The playable character is a person who is visiting Egypt on vacation and is suddenly put in a dire situation as their car breaks down in the middle of nowhere.

Edgar Holmes – Edgar is an American archeologist that the player will encounter through the items he has left behind, which tells the story of what happened at the archeological camp site. By nature, Edgar is a curious individual, who seeks knowledge at all costs, even if it means that the people he hired to help him gets hurt or dies.

Saad and his Crew – Saad who was hired by *Edgar*, along with his crew of 5 guys, falls into the category of unskilled laborers willing to do work that most people wouldn't want to do, as they have no other choices left.

Target Audience

When the prototype was first conceived, there was an initial desire to target a mature audience, who would be aged 18 and above; this is due to the likelihood that most of the people who are going to be playing the prototype, were more than likely going to be in that age category.

In the end, after reviewing the final version of the prototype, the content fell into an age range that was around 12-16+ according, based on my own personal assessment in relation to the PEGI rating system, as it has relatively real implied references to violence events.

Core Gameplay

Main Game View

The game is a first person action adventure video game, where the player's goal is to find the end of each level.

Core Player Activity

The player has a basic set of moves available to them and they gain new abilities from the acquisition of items.

Game Mechanics and Rules

Enemy Types

Due to the structure, size and scope of the video game prototype, there is only one single enemy type, which the player encounters in the second level.

The Undead – Characters that roams the second level with chaotic pathing systems that are capable of "killing" the player if they touch them. If the Undead spots the player, they drop their standard behavioral patterns and start chasing the player until they either touch them or the player leaves the sensing cone of the Undead.

Enemy "Death"

The player does not have the ability to kill any of the enemies in the game. Ideally, if the project was to be developed further, the player would eventually get the ability to kill them, as a part of a larger upgrade system.

Victory Conditions:

The victory condition for every level in the game is to find the area that allows them to enter the next level. This can only be achieved by the player if they explore the world.

Gameplay Teaching Tools

As the player enters the game, they will be given a piece of text on the upper right corner of the screen that tells them how to move In order to learn the basics; the same thing goes for all of the abilities that the

player has (Run, Crouch and Jump). There are also specific areas located in the levels, where the player can test out their new abilities before moving forward.

Item Acquisition

When the player gets a new item, they are put in a situation where they have to utilize them, in order to progress. When they get the item, a text prompt will appear in the corner, which tells the player how to use it.

Level Design

The entire video game prototype has three different levels:

- The first is designed to set up the overall narrative elements, which give the player a general understanding of what is going on within the game world and serve as a tutorial.
- The second level is more gameplay focused, as the player now has to deal with enemy NPCs, in a non-aggressive manner.
- The third level is connected to the potential death of the player, where they are transported into the realm of the death. In order to get out of that level they have to weigh their heart, to see if they are worthy of being resurrected, which means they will reappear back into the second level in a specific area. In order to prevent annoyances, the third level will only appear once; after that, they will just reset back to a save point until they can get past the

Game Controls

Example: The controls are slightly more complicated than a typical game, due to the nature of combining the keys to perform different attack moves.

Movement and Actions:

The video game prototype utilizes basic movement that is already pre-programmed into the First Person Template that is associated with Unreal Engine 4. Additional actions were added to give the player more freedom in terms of movement.

ACTIONS	CONTROLS
Movement: Forward	W
Movement: Backward	S
Movement: Right (Stafe)	D
Movement: Left (Stafe)	A
Camera Control	Mouse

Jumping	Spacebar
Left Shift	Run
Ctrl	Crouch
-	-
Pause (MENU ACCESS)	P
Menu Navigation	Mouse
Turn on / Turn off Flashlight	F
Use Rope	Left Mouse Click

Movement Descriptions

The following is a rundown of the descriptors that were added to the video game prototype that was not already implemented from the start:

Run profile – As the player presses the RUN button, they will increase their speed by 50%. There are no penalties for holding the button down permanently. There were experiments where the ability to run was limited to 10 seconds, but it felt unnecessary given the fact that this is just a small prototype.

Crouch profile - As the player presses the CROUCH button, their height decreases by roughly 50% of their original height. While crouched, they are still able to move at normal speed and they still have the ability to run.

In-game GUI

The prototype's UI is designed to be very minimalistic due to the fact that there is only one person working on it. When the player enters an area with a trigger box, text will appear in the top left of the screen, outside of that, there are no other UI elements in the prototype.

Graphics

Style Attributes

The goal is to emulate old movies from the 1930s, which means everything should be monochrome and feel appropriate for the time.

Asset list: Graphics Needed

Due to the fact that I am only one person working on the project, there are some item abbreviations in terms of what is needed for the prototype. Were this project to be handled by more than one person, the

ideal way of creating the following asset list, would require the list to go into more detail in what specific thing is needed instead of 'Camping equipment' etc.:

Characters:

- Human-like:
    - Undead (walking)
    - Skeletons (static)

Additional:

- Sand Texture for the landscape.
- Multiple cars.
- Models that can be associated with archeology (shovels, tents etc.).
- Camping equipment.
- Voice recorder.
- Sandstones and other types of rocks.
- Models associated with old Egyptian mythology; this includes coffins, statues and pyramids.
- Treasure items.
- Pots of various sizes.
- Camping equipment
- Old wood.
- Weapons (guns, knives)
- Blood stains

Cutscenes / Cinematics

For the video game prototype, there will be three cutscenes and they will play when the player presses the start button in the menu, as well as the first and second level. The goal of the cutscenes is to establish the setting of the game space and give the player context for why they are in the situation that they are in. In order to create said cutscenes, it was decided early on when the 30s/40s aesthetics was chosen, that it would contain old footage from that era, as well as video clips from the game, showing the player driving their car before it breaks down. The two cutscenes that happens after the completion of the levels will be text-driven.

Asset List: Sounds and Music

Style Attributes

The goal of the video game prototype is to simulate that of old movies from the height of the monster era in the 30s and 50s. This means that the music, audio and audio feedback should reflect what one could expect to hear from that time period. Given the fact that the final design ended up leaning towards that of being a horror game, the mood of the audio should reflect that as well.

Sounds Effects Needed

- Menu sounds when the player clicks on a button.
- Cave audio (background noise)-
- Footsteps (Generic) – If there were more time to build upon the prototype; it would have footstep sounds that change based on the surface that the player is standing on.
- Zombie Footsteps – see 2-
- Zombie sounds-
- Car Engine noises.
- Flashlight noises when turned on and off.
- Flames
- Static noise
- Heartbeat noises
- *Music Needed*
- Background music for the menu, Egyptian inspirited.
- Non-diegetic background music while playing, Egyptian inspirited.

12.2 QUESTIONNAIRE QUESTIONS

The subchapter contains all of the questions and their optional answers that were used for both tests:

Demographics Questions:

- *How old are you?*
    - Under 18
    - 18-24
    - 25-34
    - 35-44
    - 45-54
    - 60+
- *What is your gender?*
    - Male
    - Female
    - "Other"
- *In a typical week, how many hours would you say that you spend on playing video games?*
    - 0 to 4 hours
    - 5 to 10 hours
    - 11 to 15 hours
    - 16 to 20 hours
    - 20+ hours
- *Why do you play video games? (Optional)*
    - [Option to write own answer]
- *When looking at the video games that have been released over the last 10 years, how would you rate the overall quality of them?*

- o Very low quality.
- o Low quality.
- o Neither high nor low quality.
- o High quality.
- o Very high quality.
- *What type of player are you?*
  - o **Action** - I like to experience fast-paced action and thrilling events.
  - o **Social** - I like competing and socializing with other players.
  - o **Mastery** - I like to challenge myself with high gameplay difficulties and perfecting my skills.
  - o **Achievement** - I like to fully complete video games and acquire power while playing.
  - o **Immersion** - I like to explore worlds and experience stories.
  - o **Creative** - I like to experiment, create and express myself while playing.

Player Motivation Questions:

- (QUESTIONNAIRE EXCLUSIVE QUESTION) *Which of the following reward types motivates you to start playing a video game?*
  - o **Story** - Story-based content that happens between (or during) gameplay segments.
  - o **Gameplay modifiers** - This includes anything that changes the gameplay of the video game that you are playing (Example: Acquiring new items, visual upgrades, etc.).
  - o **Performance review** - A system that reviews and ranks your performance after having completed a level or event (Example: https://i.psnprofiles.com/guides/8649/c7fac3.jpg).
  - o **Achievements** - In-game systems that reward you for completing certain actions.
  - o [Option to write own answer]
- (PROTOTYPE EXCLUSIVE QUESTION) Which of the following reward types kept you motivated while playing the prototype?"
  - o **Story** - Story-based content that happens between (or during) gameplay segments.
  - o **Gameplay modifiers** - This includes anything that changes the gameplay of the video game that you are playing (Example: Acquiring new items, visual upgrades, etc.).
  - o **Neither** – I prefer to review my own performance.
  - o **Neither** – I prefer achievements.
- *How likely are you to complete the video games that you play?*
  - o I do not complete any of the video games that I play.
  - o I barely complete most of the video games that I play.
  - o I sometimes complete the video games that I play.
  - o I complete most of the video games that I play.
  - o I complete all the video games that I play.
- *What would be the likely reason for why you would want to stop playing a video game permanently? (Optional)*
  - o [Option to write own answer]
- *If you have a tendency to not complete the video games that you play, how do you feel about it? (Optional)*
  - o I don't like it.

- o I don't care about completing video games.
- o I am okay with it.
- o [Option to write own answer]

Storytelling Preferences Questions:

- *How important is storytelling for you in video games?*
  - o [Option to pick between the numbers 1 (not at all), and 5 (very important)]
- (QUESTIONNAIRE EXCLUSIVE QUESTION) *How likely are you to complete a video game solely because of the story content?*
  - o [Option to pick between the numbers 1 (very unlikely), and 5 (very likely)]
- (PROTOTYPE EXCLUSIVE QUESTION) *How likely are you to continue playing the prototype solely because of the story content?*
  - o [Option to pick between the numbers 1 (very unlikely), and 5 (very likely)]
- *Which of the following genres do you prefer to play when playing story-based single player video games? If you want to be specific or feel that a genre is missing, then please use the "other" option.*
  - o **Action** - This includes sub-genres like: Platformers, Shooters, Fighting, Stealth or Survival.
  - o **Adventure** - This includes sub-genres like: Visual novels or interactive movies.
  - o **Action-Adventure** - A mix of both adventure and action games (Example: The Legend of Zelda).
  - o **Role-playing** - This includes sub-genres like: Role Playing Games or Roguelikes.
  - o **Simulation** - This includes sub-genres like: life simulation or vehicle simulation.
  - o **Strategy** - This includes sub-genres like: Real-time strategy, Auto battlers or Tower Defense.
  - o **Sports** - This includes sub-genres like: Racing games, combat sports, team sports or extreme sports.
  - o [Option to write own answer]
- (QUESTIONNAIRE EXCLUSIVE QUESTION) *Which of the following methods of storytelling do you prefer in the video games that you play? If you prefer something that is not on the list, then please use the "other" option.*
  - o Cutscenes - Inactive events or videos that contain story content (example: https://youtu.be/mqHxGoFERZw?t=5)
  - o Interactive events - Story events where you are an active participant (Example: https://youtu.be/wfBiGDcdA9M?t=22)
  - o Auditory - Story that is relayed through sound (Example: https://youtu.be/bEUceBylHpM?t=490)
  - o Reading - Written story content that you have to read (Example: https://youtu.be/NiAFTe76iwg?t=48)
  - o Environmental - Story that is told through the environment (Example: https://gamespot1.cbsistatic.com/uploads/original/1581/15811374/3712497-thelastofus%E2%84%A2remastered_20200724154245.jpg)
  - o [Option to write own answer]

- (PROTOTYPE EXCLUSIVE QUESTION) *Which of the following reward types kept you motivated while playing the prototype?*
  - Cutscenes - Inactive events or videos that contain story content (example: The video you saw then the video game started)
  - Interactive events - Story events where you are an active participant (Example: the death level, which you may or may not have seen)
  - Auditory - Story that is relayed through sound (Example: The audio logs)
  - Reading - Written story content that you have to read (Example: The text that appears on the top left of the screen)
  - Environmental - Story that is told through the environment.