Table of Contents

1 Preface

Parts, chapters, sections:

The chapters of the report are denoted with running numbers for each chapter and subchapter. Subchapters (referred to as sections) are reset to 1 in the beginning of each new chapter. Chapter four subchapter two is therefore denoted as: 4.2.

Quotes, figures and tables:

Quotes are indicated by the use of italic, centered and with ""

Figures are clearly marked with numbers, as figure x.

Reader´s guide:

This report differs some from the standard format, as the creation of the test environment takes places in the pre-analysis and therefore the pre-analysis also contains what would usually be located in the analysis.

2 Personal Motivation

Game developers create a game considering tradition, gameplay and story among many other things. However when creating a game, one rarely considers the individual influence of a game element, that serves no higher purpose, i.e. when the game element in question is just included to create the environment one desires. So it this a potentially overlooked area? Would a game element in itself be able to change the experience of the player, and if so could a conscious use of this effect be utilized to improve upon the game? In other words this is a matter of considering how ordinary parts of an environment may play a role that does not appear fully understood, and if such an understanding might lead to an improved use of selected environmental game elements.

What drives my interest in researching games are topics in that area of game research, where one gains an insight into how the game and player interact grants new understanding of both the player and the game, all with a potential to improve and change the way we use games. The thought of effective education using the appeal of games or ways to enhance the human brain through the use of games among other things, shows the potential of games. Therefore game research offers possibilities to work with analyzing and developing a media I love , thus helping to create enjoyment for others.

This desire goes back to my early teens when I first came into contact with the opportunity to create my own game, in the form of modding[1] an existing video game. This was my first step into the world of video games, and as I have played and worked with games, I have come to realize how complex and intertwined an entity a game truly is. Games borrow from a multitude of media and work with just about any genre. That is in part why looking at a video game is so fascinating to me, a fascination I did not truly realize while I was "just" playing them. I love to play games and test their limits, trying to set myself into the game - but only rarely have I set myself to judge why the people behind the games are doing what they do or in many cases are not doing. How they try to affect the player and create the experience that I encounter upon playing the game.

[1] Modding: Term for modifying the game in some way, hence creating a new or different experience for the player

Playing games is a strange yet important part of human behaviour which plays an essential role in both learning, social interaction and pure enjoyment. Games imitate or mock the established order of society and interpret and define the roles and interplay of individuals. However computer games are unlike any physical game and much is still not fully understood even though the first computer game surfaced as early as 1947, in the form of a simple shooting game known as the Cathode Ray Tube Amusement Device (Goldsmith & Mann, 1947) pending on the definition of a computer game. The games at that time were very uncomplicated in appearance, yet heavy on hardware, and obviously much has changed since - with one exception, games still fascinate and attract us. We have learned about video games, they have become more and more accepted in our society and the development of new games is now a huge industry with billions of dollars (PwC, 2011) in play. Computer Games have in many ways had a great impact on the world, creating new industries and taking up large quantities of our time among other things, and thus it is logical that a lot of research would have gone into studying them. As such it is surprising that there continues to be an assumption that studying games is not serious work (Egenfeldt-Nielsen, Smith, & Tosca, 2013), despite the various studies which have been made in connection with the subject. Playing video games can change you, not just on an emotional level, but has even been shown to have physical effects, such as an increased visual attention (Green & Bavelier, 2003). Thus video games are at a point where they should be considered more than just fun or a waste of time. Playing games can create topics for real world conversations, create friendships across country borders and between people living far apart. People can meet and work together inside the game, a world not defined by limits of reality. However rules still apply to a video game, it is a controlled universe, created by people for people. It is created with intention and usually with set of direction and goal. The player passes through these universes, experiencing the rules of the game and following the script, if it can be called such. But if one takes a closer look, how is the player affected by this freedom and the universes he "visits", and how can that effect be used to guide and control the player in different ways?

3 Introduction and Initial Problem Statement:

Does a single game element have more than its assigned role to play in an environment, and if that is the case would there be a use for it? That is the question that lead to this study, which springs from the way video games have become more integrated our daily lives. Studies have been made into why we play games and what we gain from them, such as Jane McGonigal (McGonigal, 2011). Similarly it has been documented how games can have a negative impact (AAP, 2012) - there have been discussions about the

relation of mechanics and story (Frasca, 2003) and there are multiple pshycological studies of player reaction and intereaction (Liebrand, Jansen, Rijken, & Suhre, 1986) (Anderson & Ford, 1986), theories and definitions for why one gets absorbed playing games (Csikszentmihalyi, 1990), the impact on our lives (Funk, 1993) and so forth. However it seems that little has been done on the more basic level of understanding how individual game elements in a video game effect us. So as the game industry is seeing increasing popularity of games and the high earnings (PwC, 2011) the field of studying video games is not likely to reach a standstill anytime soon, thereby also indicating that there is an economical and social interest in game studies. This study does not aim to provide any perfect solutions nor finished work about the area of research. Instead it is build upon a previous study, that yeilded results that gave an incentive to provide a framework about a specific characteristica of an open world game environment, due to observations made doing that original testing. The study does not aim to provide a final solution nor a general theory, as it is unreasonable to claim perfect solutions based upon a limited test sample and research.

To achieve this intent, the study does not want to create a fully developed game following every finding, nor is this intended to be a final research into how a game should be. Instead creating a game environment to investigate the game elements, based on the hypothesis that certain game elements have a larger effect on players than one might imagine.

The initial problem statement thus is:

> *How would player interaction be influenced by game elements in a game environment, without any specified objectives?*

4 General Methodology

The study aims at qualitatively researching video game design, trying to discover new knowledge or learn more about areas not fully investigated by others. In line with that notion the original idea considered was simplified and focused on a basic measurement of time compared to the addition of game elements. This approach however would not result in any information of significance and instead other options were considered. Due to this, a desire for a less restricted research that would allow discoveries perhaps not considered beforehand arose. The approach to accomplish this result is to utilize the 'Grounded theory method' (Glaser & Strauss, 1967) which allows one to avoid a theoretical framework and instead create it as a response to the data, hence a reverse hypothesis if you want. It begins with data gathering, where a

series of codes[2] are extracted from the data, finding the key points (Allan, 2003), and is then grouped together and applied conceptual labels, often trough the process known as open coding that involves comparisons between event, actions and interactions (Liamputtong & Ezzy, 2005). The concepts are grouped as categories and then a core category arises based on comparisons between these categories. Using this method allows the creation of theory and ideas from the qualitative data through interpretation and comparison.

Another method considered for use in this study was the thematic analysis, which is a qualitative analytic method that by some researchers is considered as a process forming part of the grounded theory method (Ryan & Bernard, 2000), but by others is argued to be a method of its own (Brauna & Clarke, 2006). Thematic analysis is considered very flexible, in fact so much that it has been criticized for allowing that "anything goes" (Antaki, Billig, Edwards, & Potter, 2003). It consists of examining and discovering patterns in the data. This is accomplished during six phases where one familiarize with the data, generate codes, search for themes among the codes (relating them to a specific research question), review themes and finally define and name the themes, leading to the production of the report (Brauna & Clarke, 2006). However this method was discarded as the desire was more to lay the foundation for future works by giving a framework or theory for others to work with. In a similar manner it was decided to reject more traditional scientific methods that require a predetermined test subject, often testing a pre-formulated hypothesis and either confirming or denying it.

The approach to the grounded theory method in this study deviates somewhat from the original method (Glaser & Strauss, 1967). One such deviation is the use of literature before gathering data, which is a practice that is not in line with the grounded theory method - however doing so allowed for a better understanding of the subject and the creation of a more optimal testing environment. Such deviations is not unusual when using the method of grounded theory, as others have argued for differences such as Miles and Huberman (Miles & Huberman, 1994) advocate the creation of a starting list to use in the coding process, the list being based upon research questions and existing frameworks. However given the literary review which have been performed in the pre-analysis - the method that will be used in this study is based upon grounded theory, with a deviation in a similar fashion as a study by Paul Hodkinson (Hodkinson, Goth: Identity, Style and Subculture, 2002), an experience which was later reflected on (Hodkinson, 2005). In that study it is argued that while it did create some preconceptions for him to have a literature review before testing, he argues that he could use it to his advantage and that his final results and generation of theory

[2] As in the grounded theory tradition where coding means assigning conceptual labels to segments of data to identify e.g. themes and patterns. Will be written as coding or codes henceforth.

reflected in his integration of the data with the existing knowledge gained from the literature review and personal ideas (Hodkinson, 2008).

This study will first utilize a preliminary test to narrow the focus of the study for the final problem statement.

5 Pre-Analysis

Working with the grounded theory method (Glaser & Strauss, 1967), the strict approach would be to avoid using any literary review before testing and coding the data gained this way. However in order to create the game world and to gain a deeper understanding of what the stated initial problem contains it seems required to consider what others have done and to use their knowledge to build upon. Doing so should create more potential for the game environment to generate data, by for instance insuring that the players will spend some amount of time playing the game, instead of leaving after a minute - leading to more opportunities for observations that can be build upon. Thus, in the pre-analysis the following will be looked at:

- Games; in order to an establish a general understanding of how they function, in order to follow similar principles of game design, while creating the testing environment and ensure that the results gained from it has some merit to be used for other games.

- Game Elements; As game elements consists of every individual element of game, it is fairly broad list of possible subjects of interest, as such it is required to consider what should be the focus to limit the field of research.

- Narratives; narratives is an element of a game, that has the potential to play large role in influencing the player, thanks to narratives ability to integrate into the environment. Thus researching narratives creates a better understanding of its use in the game world and how for instance it can be used in conjunction with other game elements, to create emergent narratives.

- Continuation desire and engagement; As to intention is to observe the player and his actions inside the game world, it is desirable to ensure that the player will play for a length of time. Thus following principles of continuation desire and engagement could provide additional data, by creating a more interesting game environment, which allows for an improved gaming experience.

Thus by studying the above mentioned subjects I intend to create an understanding of Games, game elements, narratives and continuation desire/engagement. All with the intend to create an effective testing environment that could yield more data to be used to draw conclusions from.

5.1 Literature Review

5.1.1 Understanding Games

5.1.1.1 What is the definition of a game?

Games are the basis of this study, it is inside a game environment that testing takes place and it is where the data for formulating an theory will be gathered. The understanding gained from knowing games should not give preconceptions, but instead create an understanding of games that will help in the creation of coding and theory. Therefore it is important to consider what a game actually is and how it relates to game elements in an open world environment. The definition is important, since it is the information in the word that also impart some of its meaning - which relates to a general understanding of games, thus in extension also to the elements of the game. For instance the word video game comes from the fact that it is referring to human interaction with a visual feed on a video device. The word video is referring to early video game history and what is considered the first video game (Goldsmith & Mann, 1947), however when one is talking about computer games, the word is referring solely to games played on a computer system. Besides there are board games, role-playing games and so forth, the differences between those types are evident and even among other video games different genres exist. But they all have one common denominator: the word "game", the word that covers everything from a game of chess or poker to a first person perspective shooter.

So what is a game? A standard definition is hard to come by, although many people have tried their hand at it, sometimes with different definitions for different games pending on genres and studies. For instance a study was made by Ludwig Wittgenstein where he tried to create such a standard or common definition for games, however ended by concluding that there couldn't exist a common definition covering every type of game (Wittgenstein, 1953). He argued that the only thing one could hope for was a family resemblance between the objects we know as games. However this view cannot be considered final, and much have changed in the video game business since he died in 1951 - as such considerations have progressed into broader areas and have been an ongoing discussion for years. Not to mention that his conclusion was made without actively trying to create the common definition, and was based upon a few random examples.

He defined games as indefinable, due to the multitude of definitions that defined the variations of the games, assuming that single sentences would not be able to cover every aspect of what a game could be

(Wittgenstein, 1953). This attempt and others to define games, and in extension video games show interesting points as to how gaming relates to the human nature, but they did not truly arrive to any conclusive final definition for a game. Among those theories are the following:

> *an exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrial outcome* (Avedon & Sutton-Smith, 1971)

Sutton-Smith also argue that a game is what we want it to be. (Avedon & Sutton-Smith, 1971), He considers games to be finite, fixed and goal-oriented. His approach is based upon that understanding, and though he is known for his work and research into games, I would argue that games do not require an opposition to be a game, and part of this project is to question if a specific goal is required as well.

In recent times, however, some have made progress into making a more general definition of games - where the following two general definitions come into play: The first was proposed in 2004 by Katie Salen and Eric Zimmerman (Salen & Zimmerman, 2004) who state that:

> *A game is a system in which players engage in an artificial conflict defined by rules, that results in a quantifiable outcome* (Salen & Zimmerman, 2004).

The other is proposed by game theorist Jesper Juul (Juul, 2003) who defines it as:

> *A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable* (Juul, 2003).

The key note here is the part about rules. Rules are always a part of a game, to a larger or lesser extent. Simple rules in a video game could be the movement - by limiting it to a certain speed the player is placed under the rule of movement. As discussed later, rules are impossible to remove from a game - but likely the key is in how those very rules are used - since the right balance is part of the good game. The definition from Rules of Play might be said to suffer from looking to broadly at games, however it is always seen through the eye of the beholder. Therefore nothing would prevent just about anything from being looked upon as a game. In the book; Understanding Video Games - The Essential Introduction, the authors Simon Egenfeldt-Nielsen, Jonas Heide Smith and Susana Pajares Tosca (Egenfeldt-Nielsen, Smith, & Tosca, 2013) argues that the above definition could also be constructed to refer to an exam. This part is agreeable, though it also fails to note the very point about view. If one sees the exam in light of this definition they might very well be considering it as a game, where the goal is to get a good grade - few people consider an exam a fun way of spending time, yet it can be rightly assumed that those who get a good grade or work

with a subject they feel in control of are having fun attending the exam. Thus they are in a way considering it as a kind of game. Hence it could be argued that anything which is viewed as a game, can truly be considered a game according to the stated definition.

However while anything have the potential to be used as a game, anything cannot be a video game. An attempt to argue that anything can be made into a video game does not seem convincing - it is highly questionable if it will work efficiently. A different approach to video games, by giving features that are common in every video game, was made by game

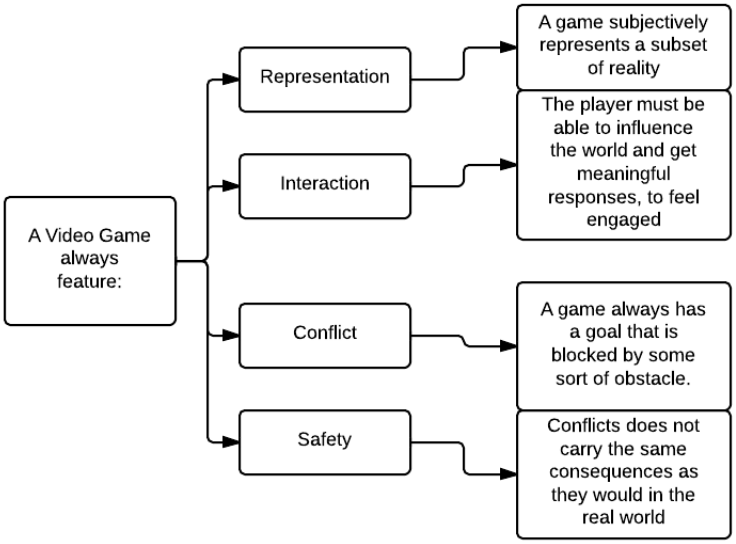

Figure 1

designer Chris Crawford who named four different features (figure 1) that he believes are and will remain common in all video games, for all time (Crawford, 1982).

As seen on figure 1, Crawford believes that a goal is a required to exist in a game, for it to function. While I concur with this notion, the real question is if a goal has to be defined by the game and communicated directly to the player, or if the goal in a game can be so to say "silently" present hence the game restricting itself to provide the environment, the game space, so that the players are not given any goals other than those they themselves decide during the game or at the end, that they have indeed reached some goals. It can be gained from this, that it matters little what a game is about, how it is made or what rules apply - as long as it has rules and as long as it is perceived as an activity that the participant recognizes as a game. Meaning that if one is working constantly gaining the same item again and again, in order to sell this specific item to other persons in a video game for real money - it will not be a game in the normal sense, given that such an activity would be more an experience of work than a game - while the notion that the player is earning money doing something he might consider fairly easy could be a "game" for him, it would be a different sense of gaming - related to how a poker player might consider his game of poker simply his source of income.

This indicates that it is required to define rules for the testing environment - rules that should be clear to the creator of the game. But the rules need not be known to the players, and it is quite possible to stick to

the original intention to avoid specifying goals for the players, in order to avoid guidance or suggestions, that might lead them on, creating bias for judging,

But it is not enough to define the rules of the game., You have to consider the play itself and the reactions of the potential players, due to the lack of obvious goals in the test game. Play is part of the gaming experience and part of human behavior, therefore understanding play can lead to an understanding of the player, which in turn might lead to further understanding of the player's interaction with the game world. This understanding in turn could lead to better coding and analysis of the test data and the creation of a more effective testing environment, that they player will 'playing' more and thus give more data.

5.1.1.2 Play

When working with a new area and creating a framework based on games, it is not enough to consider the understanding of what a game is, but also what can take place in that game. It is not just a matter of players playing, the interesting thing is when the player begins to truly 'play' and this changes how the game is viewed. The question of interest is influence of the game elements, however in order to test inside the game environment it is required to understand how the choices influence the testing environment. The players are an essential element, and it has become clear that relying only on a formal understanding of games by considering them a system of rules does not truly illustrate the game itself nor how it work. By understanding what creates the players' play experience, and thereby how the game is used, one learns more about the game. Therefore I will briefly consider what play is before considering the subject as to why we actually play games. While play has been a subject of interest for hundreds of studies (Christie, 1991) I will only be looking into some to gain an understanding of play, as the study of play is not the main topic of interest.

One of the earlier studies of play was made by Johan Huizinga for an oration: "The Cultural Limits of Play and the Serious" which he later developed and published in the book "Homo Ludens (Huizinga, Homo Ludens: A Study of the Play-Element in Culture, 1950)". He gave the following definition for play:

> *Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside "ordinary" life as being "not serious", but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner.*
>
> (Huizinga, Homo Ludens, 1950)*p. 13*

This definition omits certain options for where play exists, but it is also indicated that play requires rules and that it takes place in its own "world", meaning that it is defined by borders.

Play is considered to be voluntary activities that one associates with pleasure and enjoyment excluding the necessities of daily life (Garvey, 1990), or as put by Katie Salen and Eric Zimmerman:

Play is free movement within a more rigid structure (Salen & Zimmerman, 2004).

They consider play as being "created" from the relations guiding the system, something that emerges from the space of possibilities in the structure of a system. For instance a popular activity in the game series Grand Theft Auto (Rockstar North), is where the free-roam structure of the game allows the player to go on a rampage that often goes counter to the player's objectives or general safety inside the game, yet is an activity one can waste hours on. There is no specific goal involved in this rampage other than the one created by the player, whether it is to stay alive or just to do a certain desired action. If that part of Grand Theft Auto is play, then it goes to show that while a video game is about playing - it might also be part of the game structure within the game to "play". Thus one could theorize that when the elements of the game creates the possibility for the player to play, it could enhance the player's desire to continue playing by adding more to the game than e.g. pre-made objectives.

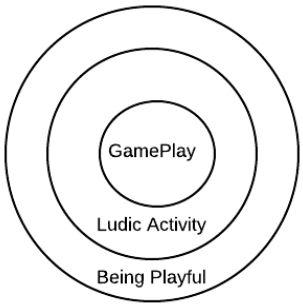

Figure 2

This goes in line with the three categories of play (Salen & Zimmerman, 2004) (figure 2). Where gameplay is the part formalized interaction with game following the rules and experiencing the system, Ludic activity is the play itself, meaning not necessarily structured like a game, but including every kind of play - not only games. Finally being playful is not solely the activity of play, nor is it about games, instead it is about the mindset of play, where one is in a playful state, for instance by giving nicknames (Salen & Zimmerman, 2004).

Hence following the definition play and the different categories, Salen and Zimmerman states that play exists due to rigid structures, but also acts as a sort of opposition to them. When the before mentioned rampage occurs it goes against the general structure of the game, yet it would likely not be as humorous if not for the structure of the game. This indicates further that rules are part of the game, and by creating structure in a game one is also creating the means for a player to "play". However how loosely does one need to facilitate this structure in order to create an interest of playing? In relation to the initial problem statement it is required to understand how loose such a structure can be, while still facilitating a desire to play the game for the player, considering the lack of a goal - thus lacking some of the structure, will the player still play? However as Roger Caillois (Caillois, 2001) notes, make-believe is also a part of play

and playing a role creates Its own rules even if none is present. Thus without enforcing a set of rules or give directions the player themselves can create rules while playing their part in the game and thereby experience play. This approach should be considered as part of the product, as it allows for the users to experience, thereby hopefully creating a better experience while at the same time connecting the players to be in the game and allow them to 'play' longer.

5.1.1.3 The Structure of Video Games

Having reached the assumption that one requires structure and the existence of rules in order to play, and given the effectiveness of play, that it may increase playing time, even without specific goals, it essentially comes down to the structure of the video game, the basic creation of a game and what it contains. This structure can, according to video game designer Tynan Sylvester, in its basics be separated into two different elements that combined will create the game: mechanics and events (Sylvester, 2013). Element by element a video game is created, with each part playing its own role - However what game elements and how many depends entirely on the game and the intention of the creators, as it can be everything from the choice of music to the choice of which specific colors the pictures used to create an environment should have. In certain cases it might even be a limited selection of colors that create a new game element, and is of importance to much of the game, such as the case with Limbo - where a lone protagonist wanders along in a black environment (figure 3).

Figure 3 - Ingame Screenshoot

Thus looking at a more simplified deconstruction of a video game, one can learn more about the interplay between mechanics and events (Sylvester, 2013).

In the case of a video game the basis is the mechanics. The mechanics are the workings in the game, they are the code, the rules. They provide the instructions for how the game functions, from the player's movements in the world, as to how a building collapses. They provide the restrictions and control, so for instance when "A" is pressed one moves forward with a certain speed, again also decided by the mechanics.

In this way the mechanics of a video game will control and take part in more than what is immediately evident, as actions in the game e.g. falling into a low gravity, would work due to the mechanics of the video

game. However how it is used is something the player decides. This area is something special to video games, it is what can be called the events. The events are in fact an "event" between the player and the mechanics, the event arises when the player interact with the mechanics and as such create the event. This makes those type of events unique due to how one can both control and not control what the player experience (Sylvester, 2013). One can also consider scripted events, where the player loses control and instead the computer is following a pre-set order. This ensures that the player arrive where one desires and therefore serves to give a strict control over the players' information and to give an experience similar to watching a movie. These events are sometimes cut-scenes, which is actual video of the event or in modern days the cut-scenes are kept in the same view and appearance, just without control, or perhaps with a limited form of control, for instance pushing a button on command as a form of pretended influence, in order to avoid an undesired outcome. A technique that in my opinion was employed successfully in the acclaimed game Fahrenheit (Quantic Dream, 2005). It was called an interactive movie and featured an interesting story and a variety of action events where the player had the task of pushing buttons (see figure 4).

Figure 4 - Ingame Screenshoot

However it is likely that a primary reason why it worked, was the interesting story of the game (Schneider, 2004). But it is worthy of considerations how those scenes were perceived by the player. The game has a feature that after it is completed one gains access to replay any part of the game at will. The may be various reaction of players to this feature, but from personal experience I find it interesting to note that when I went back to replay the scenes, there were certain scenes I always played again, and certain others I always avoided - assuming other feel similar it indicates that the interaction and the reward for doing it right worked better in certain scenes than others. Illustrating that the way an element can be used might depend on the situation and the reward the player attains, thus it is not the goal itself that proves interesting - but what one receives for doing it.

That brings me to the very essence of a video game; how the interplay of mechanics and players (Sylvester, 2013) decide how the game functions and is used. By changing the mechanics one is changing the game, and by using those same mechanics as part of an event one has control over the emotions and interest of the players. It is the events, whether made by the creator or emerged from the mechanics that create the emotions in the player and as such it is how they are used that decides how the player will act and how the

video game is received. Therefore a logical step is to take a close look at events and how different events influence the player.

In the book; designing Games Sylvester (Sylvester, 2013) talks about how one creates an emotional experience for the player. Something that is primarily done by considering the different scenes that are hardwired into humans from the beginning. We as a race are looking for rather simple interests: survival and reproduction, with variations pending on those. This means that by using similar themed events that speak to those parts of the human psychology, one has a good chance of having an impact on the player. Emotional triggers (Sylvester, 2013), as they are called, can have an impact on a player, and the player will not even be aware of it. It can be minor things such as minor reactions to fear when standing on a high place, even if the said high place is located inside a game. While we know on a conscious level that it is a video game, the brain still acts otherwise. Things that does not seem evidently important can suddenly change meaning; a high match game can have a huge effect on the player if he/she is losing, where whatever game one is playing takes on a whole new importance. The stakes could be anything, but if it for instance was real money then all of a sudden this game is not just e.g. a game to shoot all the fake ducks, but instead a question of survival. This relates to the notion; survival of the fittest so to speak (Darwin, 1869). Thereby using events that utilizes these emotional triggers leads to creating a game that have a larger chance of interesting the player - thus affecting his/her desire to keep on playing, even without a game created goal and by extension the data gathering. This understanding that events can manipulate the emotions of the player, shows the importance of including events in the environment to create an effective game. The subject of emotions in games will be further expanded in a later chapter.

5.1.2 The Basic Selection of Game Elements:

To understand an entity such as a video game one needs to understand the sum that creates the whole, meaning that a video game is a collection of many different game elements that all in turn create the game. One will encounter game elements constantly while playing, as a game element is basically anything in the game, such as objects, sounds, interface and story. The objects refers to things such as a car in the environment, an item one can find or even the players character. However the classification of objects does not apply to music or background graphics (Egenfeldt-Nielsen, Smith, & Tosca, 2013).

In relation to the goal of the initial problem statement to research navigation in relation to game elements, it is required to limit the scope of the study given the very broad area one would otherwise be forced to

consider. Instead I chose to focus on more specific game elements to better judge influence and control the experience. However as game elements are such a broad area, it is purposeful to limit to the scope and focus on more specific elements in order to make it possible to judge influence and control the experience.

In the area of game elements some have been researched and applied for this usage on larger scales than others. For instance sounds and music in games is an often researched topic, dealing with e.g. how they improve upon the game and set the mood in the game by use of sounds (Ekman, 2008). In a similar manner the story and the interface have been considered in relation to game design and as means to improve upon game creation, which for instance is the case in a study about video game characteristics (Wood, Griffiths, Chappell, & Davies, 2004). However the area of game objects in the relation to navigation is a subject that appears undocumented, as such allowing one to discover and form a new theory about an important part of a game and perhaps add new knowledge about games.

5.1.3 Flow

When someone plays certain video games there is a tendency for the players to get caught up in the game, and for instance lose track of time. Indicating that the player is likely to get more absorbed in the game, which could mean that he would be reacting in a different manner as opposed to one who was not as absorbed into the game, and in a similar manner might also make him play longer. This absorption has been researched and theories have been established in a variety of ways, one such is the idea of flow which was proposed by Mihály Csíkszentmihályi, in his book; "Flow: The Perfect Psychology of Optimal Experience" (Csikszentmihalyi, 1990). It describes flow as a state of concentration, absorption and satisfactions that is experienced when performing an activity. What the activity is, matters little, as long as it is something that one enjoys and thus creates an optimal experience, however it is usually activities not associated with daily life and routines. These activities also contain a sense of playfulness and are:

> *An end in itself. Even if initially undertaken for other reasons, the activity that consumes us becomes intrinsically rewarding* (Csikszentmihalyi, 1990).

Csíkszentmihályi order the experience of flow into seven elements of enjoyment or characteristics (Csikszentmihalyi, 1990) (figure 6).

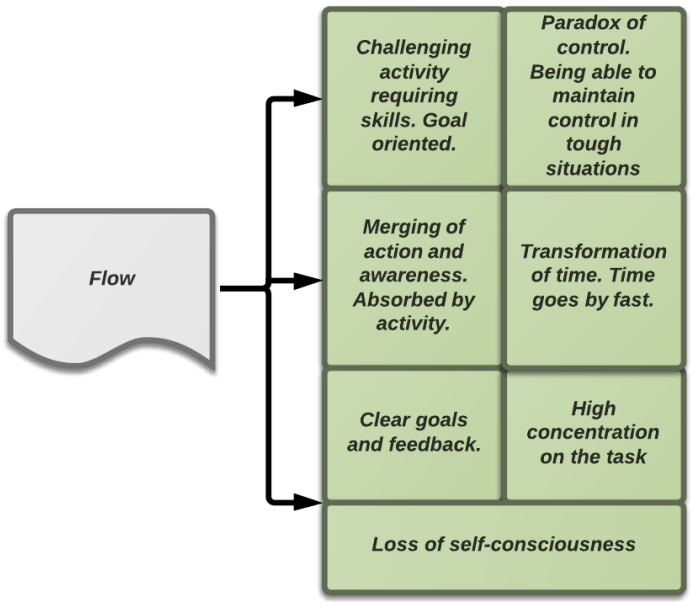

Figure 6 - Elements of flow

Where each element should be present in order to experience flow. These elements give indications as to how one can judge flow as well, for instance by measuring time as comparison to the time experienced by the player. Similar it also shows a high value of goals in order to achieve flow, leading to the assumption that flow cannot be experienced without a goal, hence that the proposed purpose of this project will not lead to flow, as clear goals and a goal oriented play is counter to the intention of play without a goal. However as the purpose is not to induce flow, it matters little and instead the elements itself should be considered as valuable information about creating an efficient experience. The reason is that one of the first steps Csíkszentmihályi mentions as part of creating a flow experience is to make the activity a game, where the persons create their own rules, establish objectives and potential rewards - thus allowing one to be absorbed in a powerful goal. Now that is not the only thing, since in order for such a goal to work it must be aligned with the abilities of the person such that it is neither too easy nor too difficult (figure 5) (Csikszentmihalyi, 1990). This speaks of an connection between the challenge of the game and the players' interest in the game - which again might refer to the emotions of the game - In fact Sylvester notes about flow, that nearly all games have to maintain flow and that the problems in bad games come down to breaking the flow (Sylvester, 2013). In that relation it is interesting to note Jane McGonigal's explanation as to why we play games in relation to flow. According to her we play games because:

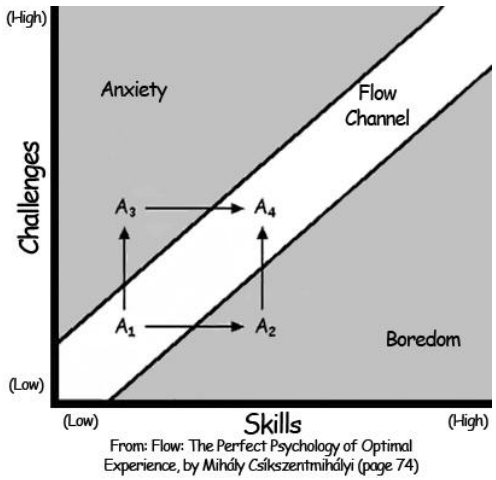

Figure 5 - Flow Chart

Games are providing what reality cannot (McGonigal, 2011).

Games give us joy because that it creates rewarding interaction as opposed to passive entertainment, which make it worth our time to struggle with the game. They allow us to experience flow immediately. She have indentified four different rewards that she finds make games rewarding to the players.

We crave satisfying work - hence activities that show a clear results of our efforts.

We crave experience / success - meaning that we want to be impressive and shows others what we can do.

We crave social connection - Sharing experiences and form relations, of by doing things together.

We crave meaning - A desire to feel curiosity, be something more, feel awed (McGonigal, 2011).

While these rewards like the others are part of the reason, they are not the solution. If we truly got those rewards from games and were conscious about it, there would be a huge potential in video games for taking care of psychological issues, however that does still not appear to be the case. But out of those rewards it is interesting to note the one about craving meaning, as it appears to indicate that part of playing games revolve around ones curiosity, making it likely that by allowing for a world that the player can explore and "discover" at one's own leisure, one can build upon this curiosity as a way to keep the players in a game without a game created goal. Thus the element of an open world should be included in the final problem statement, in a similar manner, the rewards might have further implications in relation to the player interaction and should be considered for later research.

5.1.4 Narratives

5.1.4.1 What is a narrative?

As events is the prime focus on the project, it is important to consider what a narrative is, as events will often be directly related to the construction of the narrative of a game. Narratives are a part of what affects ones emotions and form the story. A narrative has, just like a game, been defined in various ways, such as:

> *One will define narrative without difficulty as the representation of an event or sequence of events.*
>
> (Genette, 1982)

Which shows the clear relation to events. As another example is has also been defined as the following:

> *Narrative . . . may be defined as the representation of real or fictive events and situations in a time sequence.*
>
> (Prince, 1982)

And as noted in Breaking the Glass Armor: Neoformalist Film Analysis by Thompson, K (Thompson, 1988). it is also important to consider that a story and a plot relates differently to narratives. A story is the way our brain structures the events in the head related to time, while the plot is the sequence of events. This means that the very events that make up the game are the narrative, but it also implies that having a plot to follow the events is not required in order to have a narrative, as the events are the narrative and the order in which the player encounters said events creates the story, no matter the plot. This relates to the discussion by Rudrum (Rudrum, 2005) where it is argued that narratives is not solely a sequence of events, but also depends on the eye of the beholder, meaning that the narrative can change completely from person to person no matter how obvious they might seem to the creator, pending on how they experience the event or interpretation of its use. The interpretation of the events can vary due to social conventions and experience. For instance the notion from the initial problem statement to avoid specifying a specific goal for the player to complete might be considered perfectly fine by some players with experience in certain games, while others who primarily play other type of games or perhaps do not often play games might be confused and react in a different way that originally assumed. In fact Rudrum (Rudrum, 2005) notes that one can never predict a naretee's reaction to a narrative with absolute certainty, which leads to the conclusion that the intention of the events that make up the narrative is less significant when compared to the actual outcome. If the outcome is that the player is interested in continuing with the game, it matters little if the creators' intended narrative was communicated. In this situation only asking the player what he/she liked about the game, will tell you how they perceived it and reacted as they did. Hence by avoiding a "red line" for the player to follow, one is increasing the chance that the player will not perceive the story, however doing so should not prevent a story from being perceived. Note the important difference between "the story" and a story, for example the story would be the story written to the game for the players to experience, while a story is the one the players perceive themselves - hence as long as some sort of narrative is perceived the player is getting a boost of interest (Jenkins, 2004). Thus a game without a fixed narrative may very well prove to contain a narrative all the same, yet constructed by the player him/herself.

5.1.4.2 Environmental Storytelling

Telling a story is not just about using the right words, it is also important to consider how the story forms in our minds. By controlling the images we control the story, therefore one can also create the story with pictures. Environmental storytelling is all about creating the world on the image or in this case a game.

> *When gamer magazines want to describe the experience of gameplay, they are more likely to reproduce maps of the game world than to recount their narratives* (Jenkins, 2004).

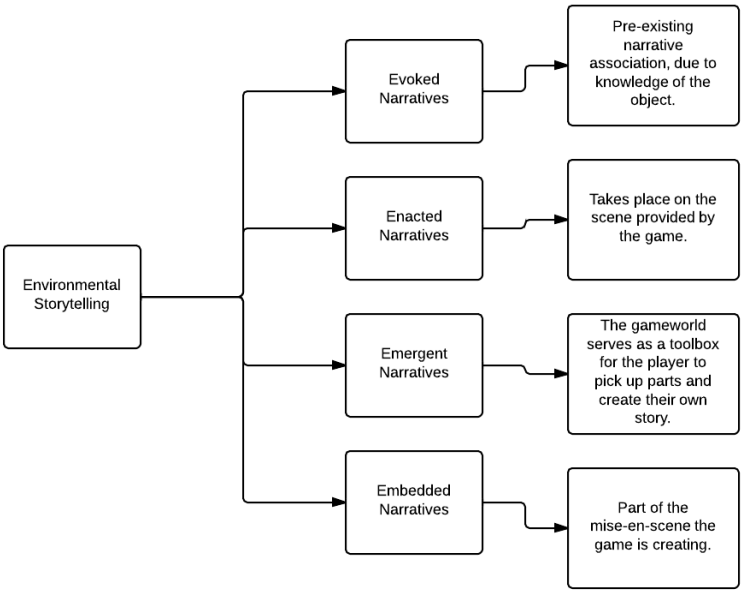

Figure 7 - Narratives

A telling notion that we recall and judge based upon the images, hence speaking to the importance of the scenario of the game - The game space.

An image that the player can take part in and approach from any angle is what make it both a challenge and a bonus to use the environment to tell the player the story of the game. By using a variety of imagery to tell the story one allows for creating a structure to the narratives that the player experiences in different manners and the considerations about how the different structure of the game space facilitates a variety of narrative experiences (Jenkins, 2004). Meaning that creating games is not just a matter of placing elements and hoping it works, nor is it about making a direct copy of reality - if that was possible creating games would be a lot easier. Instead it requires one to make use of the options that working with a video game allows, recreating memories and materializing imaginings in the story world for the players to immerse themselves into and interact with.

Henry Jenkins (Jenkins, 2004) categories environmental storytelling into four different narratives as shown on figure 7. Each of the four different narrative categories is interesting by its own right as it lays out a frame for which one can assemble the story of the game, as part of the game itself. Hence one can use the knowledge of evoked narratives, where the object is telling due to pre-existing knowledge to allow for instant recognition and assumptions made by the player, meaning a potential reduction in what is needed to inform the player of events. Similarly using the game space as part of the story allows game designers insurance that the player will be informed about the essential narratives.

Within an open-ended and exploratory narrative structure like a game, essential narrative information must be redundantly presented across a range of spaces and artifacts, since one cannot assume the player will necessarily locate or recognize the significance of any given element (Jenkins, 2004).

Meaning that by traditional standard one is following the same concept as movies and series have done, by presenting the narrative elements to the viewer in a manner which makes it likely that it will not be missed. However that is not the only approach to a narrative. Emergent narratives makes it possible to just place

the elements of the game in the hands of the player and allow him or her to create their own story. Examples of such games could be Minecraft, a game where the players are placed in a fully destructible environment, to do whatever they want, be it building a bridge or growing a tree (Mojang AB, 2010). Or the Sims where the players are given control over a family they create themselves and form a life for (Maxis, 2000).

Considering it means that the story of the game does not require strict control, but instead can be a spatial story where the elements as a whole creates the story. However elements by itself do not create the story, though an interesting approach could be to see how a game with only elements and no binding would work. But as already discussed one does not need to have a choice of either, instead of using environmental storytelling one is able to shape the environment into the binding of the story.

"*The organization of the plot becomes a matter of designing the geography of imaginary worlds, so that obstacles thwart and affordances facilitate the protagonist's forward movement towards resolution*" (Jenkins, 2004).

Referring back to the initial problem statement, this binding seems to be part of keeping the player going. However it also means a lot of thought into how the player approaches the game, thereby placing increased value to the events and the mechanics that make up a game. The events would function as what Jenkins call micronarrative (Jenkins, 2004), where the player will deal with isolated events that influences the players emotions, and as such it could facilitate a desire in the player to keep playing the game, without an actual purpose. This goes counter to the notion of Sutton-Smith (Avedon & Sutton-Smith, 1971), who as mentioned in chapter 2.1 finds games to always be goal oriented, other than perhaps the player's own curiosity forming a desire to explore. Emergent narratives, where the game world acts as a toolbox from which the player can select the elements for creating his own story, fits well with the study of game elements, as an connection between game elements influence and emergent narrative seems plausible.

5.1.5 Player Engagement

In relation to the initial problem statement it is a requirement to know that the player desire to play the game and to gain an understanding of this desire to continue with the game in order to properly judge if that is the players intention and prepare the game to fulfill that purpose. One such approach to the notion of continuation desire is a study that shows player engagement as a process the player goes through (Schoenau-Fog, 2011).

In this study engagement is concluded to be:

Engagement can be explained as a process whereby players engage in a pursuit of objectives (intrinsic or extrinsic) and consequently perform a range of activities (interfacing, socializing, solving, sensing, experiencing the story and characters, exploring, experimenting, creating and destroying) in order to accomplish objectives (by achievement, progression and completion) and feel affect (positive, negative and absorption) (Schoenau-Fog, 2011).

Which shows pattern that can be used in relation to testing as it indicates activities they perform and thus are influenced by, in addition to being part of the considerations to options that is required for a player to remain engaged in the game. The process of engagement follows in line with flow, however it also varies in the aspect that it is not a requirement for the game itself to offer goals, but instead the player can be assumed to create his or her own. This means that by having an open space environment one allows the objective and activity of exploration and when combined with events in the game world this should ensure that the player will have a reason to continue playing and an interest in what is going on in the game environment.

5.1.5.1 Emotions in Games

We learned in earlier the importance of emotions. In order to invoke emotions one must be aware of how these emotions can be created and used in order to increase continuation desire. Referring back to the chapter about game design, one of the points is that events in the form of gameplay are a major contributor to the emotions in the game, thus part of what makes us play (Järvinen, 2008).

A study by Nicole Lazzaro and XEODesign is interesting as it aims to discover which other elements than the story of a game which triggers emotion - and considers how to do it. The team concluded their research by defining four keys that result in emotions based upon their test results gathered during multiple testing scenarios (Lazzaro, 2004). Not surprisingly their findings match the results as to emotional efficient methods which have also been mentioned in connection with video games and their content. They define the following (Lazzaro, 2004):

1. Hard Fun:	**2. Easy Fun:**
Players like the opportunities for challenge, strategy, and problem solving. It frequently generates emotions and experiences of frustration, and triumph.	Players enjoy intrigue and curiosity. Players become immersed in games when it absorbs their complete attention, or when it takes them on an exciting adventure. It generate emotions and experiences of Wonder, Awe, and Mystery.

3. Altered States:	4. The People Factor:
Players treasure the enjoyment from their internal experiences in reaction to the visceral, behavior, cognitive, and social properties. Leads to internal sensations such as Excitement or Relief from their thoughts and feelings.	Players use games as mechanisms for social experiences. Creates emotions of Amusement, Gloating, and pride coming from the social experiences of competition, teamwork, as well as opportunity for social bonding and personal recognition that comes from playing with others.

When dealing with a single player game one can ignore the fourth key. The other 3 keys can be linked with the notions of Crawford (Crawford, 1982) such as conflict for hard fun, interaction as easy fun and safety as the altered state. Hence when dealing with the open environment of the game one should be able to take advantage of the easy fun to create emotions. However emotions and games are intertwined in ways not just to be considered as separate objects. In the pre-analysis a game was modeled as being divided into two boxes, one for the mechanics and another for the events. However a third option is the MDA Model, which was developed by Robin Hunicke, Marc LeBlanc and Robert Zubeck where a game is split into 3 dimensions; mechanics, dynamics and aesthetics, hence MDA (Hunicke, LeBlanc, & Zubek, 2004). These three definitions is a result of a game broken into components and then returned to how they appear in the design (figure 8). The mechanics are as we know them, the dynamics represents the actual events, that are experienced by the player. Meaning that events might occur that have not been foreseen by the creator. Such would be considered in line with the emergent narrative, hence relating to the problem statement. Aesthetics cover the players positive emotional response as they play the game:

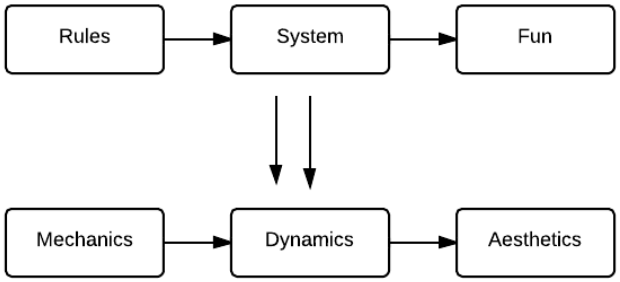

Figure 8 - MDA Model

Sensation, fantasy (Make believe), narrative, challenge(obstacle), fellowship(social), discovery (uncharted territory), expression (self discovery) and submission(pastime) (Hunicke, LeBlanc, & Zubek, 2004).

These emotions are not required to be present in every game, and games will usually not offer them all, instead combinations of them make up the games emotions. The important understanding is that they should be considered tools to understand ingredients one can find in the games and it is simplistic. However they are also informative as they points to the positive emotion of discovery that in an open

world environment without goals will play a large role. As such part of the design needs to include elements worth discovering and thoughts as to how one will move in the created test game.

In addition to the above notions we as humans are also slaves to our instincts and a large part of why we can get absorbed into a game and experience the before mentioned flow is exactly due to how our brain works. We react to emotional triggers as if they were effecting us physically.

This physical reaction relates to a discussion between the influence of fiction in relation to the mechanics of the game. It is an ongoing problem that each will suffer from the other. Having to follow a strict fictional reality might make certain mechanics harder to perform or cause trouble for the balance of the game, relating back to how the requirements of the game needs to be in balance to experience flow. Hence in the discussion there are groups who see one over another, however one can reach a stage were both fiction and mechanics are in balance with one another, thus creating a more efficient game (Sylvester, 2013). Now this is important due to the before mentioned physical effect, as the fiction is what provides our brains with "instructions" as to how this physical reaction should be judged. Meaning that by for instance using the emotional trigger of life and death which every normal human will have an reaction to, we create a response in our brains to the perceived threat to our life, then the fiction informs us about intention of the game, and we might end up considering the response to enjoyment of the game. Another approach is using music to increase our arousal and again via fiction give it another label that our minds accept. This is known as the two-factor theory of emotion. It deals with emotions as composed of two parts: physiological arousal and a cognitive label (Schachter, 1964).

The cognitive label is in this case the fiction. Hence this is part of the reason why emotions make us play games, we are manipulated by reactions that might not actually be what we perceive, similar to the situation where we are absorbed in a game which is actually a reaction in our brain where a part of our brain known as the thalamus which is tasked to decide what to discard of sensory data in order not to overload the brain - and as it decides it by order of importance we can make it discard sensory impressions judged not of importance, such as sounds not part of the game we are currently playing (Madsen, 2012).

However the importance is to note that emotions of the game are linked to how we make explain them in the game, thus the layer of fiction provided by the story.

5.1.6 Why do we play games?

So we know that play requires structure and we know that part of a game allows one to influence emotions, but still why do we play games, since we know that playing games can be counterproductive to activities that matter in life. For instance one will spent hours playing a game while in fact one had to sleep, work on

an important assignment or prepare for the day to come, but instead we play. We cry over a game and will often get angry at a game when something does not go as intended (Lazzaro, 2004). What is the key to this odd behaviour in humans? One can assume that it is due to a boost of self-esteem to those who play the game and achieve their goals in it, thus proving that they are good at it. They create they own purpose in the games, which functions as rewards for the act of playing. This notion is part of the explanations Juan Alberto Estallo gives for the urge to play games - and he expresses the positive aspects of playing games such as high level of creativity, extroversion[3] and an increased learning capacity - something that might also be part of the reason why we play (Estallo, 1995). This boost to self-esteem might be one of the reasons that certain people have been talking about gaming addiction and the reason why some are warning that we should be careful with how we go about playing video games and whom we expose to them (Goltz, 2010). However boosting self-esteem is not the only proposed answer to the question, why we play games. Others have explained it with how games relate to one self. For instance Dannis D. Waskul argues that:

> *boundaries inevitably implode as person, player, and persona blend and blur into an experience that necessarily involves all three* (Williams, Hendricks, & Winkler, 2006).

He is referring to the persona one creates in role playing games, giving a perspective into how ones real-life becomes entangled with games and how one forms relations inside the games with other players all of which play an important role in player motivation (the latter of course only applying to multiplayer games). As another option we have Torill Mortensen, who is of the opinion that the gaming environment is the cause for a great deal of pleasure in gaming, by permitting personal influence, social interaction and development in relation to other players, not just with the game (Mortensen, 2007). This view of things goes well with how Sue Morris (Morris, 1999) considers that games provide creativity and autonomy which is not found in other forms of recreation. They both consider the game to be providing something for the player, and others have found that playing games allow one to escape alienation and to engage in activities that goes beyond consumerism[4]. So in essence we return to a previous point about how emotions are part of our gaming experience. One such link between is stated by Aki Järvinen who finds that games not only draws out emotions from players, but also leads them to predict their own and other players' future emotions. Hence he states that:

[3] Talkative, outgoing, energetic
[4] By purchasing goods in ever larger amounts

Gaming encounters, thus, presents an 'emotional huddle' of sorts, and in its center there lies a game system as an agent, the actions of which are predicted as well - through trial and error of scripts and schemas that are channeled through game mechanics to the game elements and system behaviour (Järvinen, 2008).

Hence a link between gameplay conditions and emotions, which fits with how play is to be part of gameplay and how events take part as creators of emotions. However those emotions that make us play games are not solely linked to the game itself as already hinted at in relations to other players - but these outside the game created emotions relate to how the influence of others work even when playing a single player game. It could be by bragging about the latest victory or it can be in the case of websites with ranking systems. All in all there is also a large metaculture (Egenfeldt-Nielsen, Smith, & Tosca, 2013) to gaming that while important to consider when creating a game, will not be the focus of this project. What can be taken from this is the rewards of gaming quoted above: freedom, creativity or autonomy, which require one to consider the aspects possible to fit in a game without created goals and without the option to create a fully realized game.

In addition there is the explanation of flow, or rather the experience of flow. An experience that is argued to be the reason for gaming and the joy of gaming, by creating an experience that satisfies the player and absorbs him/her into the activity. The notion of flow does not only fit video games, but also a host of other activities meaning that it by itself is not the reason people play games. However it certainly plays a role, and understanding flow could be a large part of creating a good gaming experience, thus also understanding elements of importance in order to make a game work.

5.1.7 Visual Storytelling

When looking at stories and more so games, one cannot avoid considering what visual storytelling is and how it is used. Visual storytelling is in all its simplicity just a drawing to inform someone of an event. A caveman's drawing of a successful hunt for deer on the cliff, priests creating religious motives and stories on the walls of a grave, both are visual storytelling. Telling a story without words. Such elements can prove to be very vital elements in a game without a game created goal, because the visuals are the elements of the landscape and they can work as the emergent narrative. Such a story is interpreted from our understanding of the images we see, meaning that one looking at an image is assuming what it tells based on the knowledge and social background one already have. Simple images like a stick figure is usually universally recognized as humans because we are aware how to perceive ourselves, however one might imagine that if a person had never seen himself or another human being might not realize what that image of a stickman meant - A favorite example of this assumption of understanding without realizing the

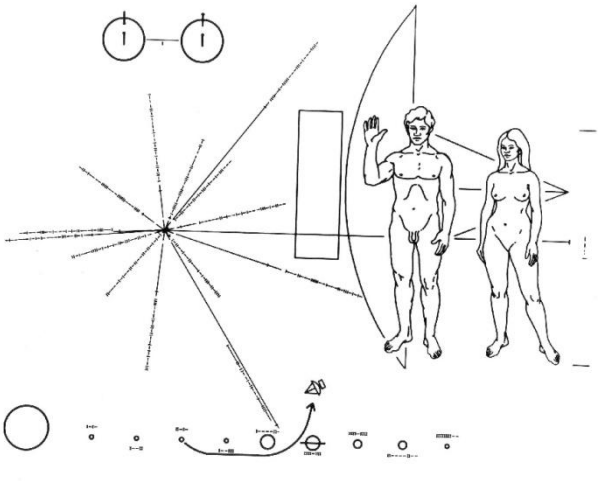

Figure 9 - Engraving on the Pioneer probe (Western Washington University)

difference in perception is the Pioneer-space probe which was launched in 1972 with among other things a plate engraved with pictures of a naked man and a woman on its side and other symbols meaningful to us humans (figure 9).

It is likely that if an alien race ever came upon this probe that have left our solar system and is heading towards the star Aldebaran, a trip that should take around 2 million years to complete, it will not be understood at all (Gombrich, 1972). Because of how all of the symbols and drawings on it was made from a human point of view. The solar system as we see it, ourselves as we see us. This relates directly back to narratives and how one interpret a story. As Wittgenstein states in his book Philosophical Investigations, published in 1953 (Wittgenstein, 1953):

"We do not realize that we calculate, operate with words, and in the course of time translate them sometimes into one picture, sometimes into another"

Therefore working with visual storytelling is a tool of great power and great weakness. It allows for images to work just as the saying goes: "A picture is worth a thousand words (University of Regina)" - Hence the notion that it is possible to explain complex information by using a single image, because using images allow for a large amount of data absorption without the need for language and words. For example that is the reason why using signs in traffic is often pictures and symbols instead of words.

Figure 10 - Sign Post

A sign with a simplistic drawing of falling rocks (figure 10) will for most mean a warning that there is a danger of exactly that: falling rocks. While such a sign might be misunderstood by some, it is certain that if it was written in the language of whatever country the sign is in, that everyone who did not read the language or perhaps could not read at all would not understand the danger the sign warned about. That is the reason why learning new words is often linked with an image. So that one can see word and read it, thus creating association of the two things (Samuels, 1970). Thus by using visual storytelling one has access to a much broader audience, as long as it is understood what limitations it suffers from. The fact is that visual storytelling is about interpretation and relies upon pre-conception and pre-knowledge of common symbols, however visual storytelling is still almost universal thanks to the

similarities in humans societies around the globe, meaning that simplistic visuals allows communication with just about any human being on planet earth, with the exception of visually illiterate or other dysfunctions renders them unable to see the visuals (Hortin, 1980). This bridge between language gaps that visual storytelling creates (Scarles, 2010), is a mean of communication that is very effective in a game, when telling a story and even more so when using a spoken or written narrative is secondary. Potentially a purely visual game would not need to be translated and would be understood by everyone, assuming the same cultural background - hence why visual storytelling is as effective a way to invoke emotions as narrative elements.

5.2 State of the art - Game Products

5.2.1 Introduction

As part of the approach by comparing with previous work, in order to formulate an understanding, it is a logical next step to look at what has already been created of games. With the thousands upon thousands of electronic games in existence, it is important to remember that a lot of approaches to creating a game have already been tried by others. By looking at what worked for them and consider how well received the game was, one can gain an impression of what appears to have worked and what might still work. This knowledge can then be compared to research results and for further testing to draw comparisons and make conclusions as to their effect.

Given the large amount of games in existence the decision was to select a few that showed different approaches to a game. One was selected because it was newly developed and dealt with large primarily nature based open world, similar to the one desired in the problem statement. The others were selected due to their use of game elements or lack thereof.

Far Cry 3 is a modern example of a sand box game, where the player can roam freely. Yet it is also an example of restricted cut-scenes and controlled story elements with set goals.

Proteus serves as example of a game featuring only a procedural generated island, no goals, no story and a world to freely explore and sounds to enjoy. A game were its elements are produced at random and yet relies on the game elements to work.

Thirty Flights of Loving is an example of a game featuring only a story, with a linear world, no goals and strictly controlled actions - yet also a game with quirky design choices and where the environment is both

integrated in the story, yet plays little role for the actual story - interaction with the elements of the world serve no, except in scripted scenes.

Hitman Absolution features free-movement in a scene, with a specific goal - but no specification as to how this or those objectives should be completed, hence allowing total freedom within the rules of the game. The game utilizes the game elements to create a variety of different experiences based upon those - by allowing the player to discover their way to complete the objectives.

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5.2.2 Far Cry 3:

Far Cry 3 is a video game developed by Ubisoft Montreal in conjunction with other Ubisoft developers and published by Ubisoft (Ubisoft, 2012). The game feature a sand box environment, with free choice of what to do for the player, multiplayer and a main storyline. The game which is the third in a series takes a somewhat different approach than former games by giving the player more control and by increasing the focus on story elements. At the same time the player's development is connected to his/her exploration of the game, where completed parts of the storyline unlocks more options to the player. Bonus objectives gives the player clear advantages and in this way the player is encouraged by the game to complete objectives, increasing time spent on the game (figure 11).

Figure 11 - Ingame Screenshot

The quests themselves are kept in linear approach, while still maintaining a general appearance of freedom. The player are free to move to objectives how they please, however the game only progresses when one is located at the pre-marked spots. It creates holes where the player might foresee actions which the foe in the game might do, however one cannot act on them since the game does not allow it before the player is in the specified location. For this very reason this approach creates problems as one loses the feeling of being in control when playing the game, yet it is still a very effective game. This is also true when judged at from reviews where it scores high on the list by both players and professional game reviewers (ca. 9 out of 10) (IGN, 2013). This shows an indication that even though the game has its flaws, the combination of the story and the open world works well, as indicated by

its popularity. This is an appraisal of how effective free roam can be, even if the story itself is controlled - thus relating to play within a structure.

5.2.3 Proteus:

A video game developed by Ed Key and David Kanaga, and published by Twisted Tree (Key & Kanaga, 2013). It is classified as an indie game (independent video game), meaning that it is created by a group or person without financial support from a publisher. The game is about walking around in a world that is generated every time a new game is started. One can walk around anywhere, crouch, walk on the water and nothing else. In the game one can observe the world, listen to sounds and the music of the game and at certain times enter a circle to change to a new season. Nothing else occurs in the game, and this is very interesting since this approach shows how a game with a bare minimum of gameplay elements and no story can be made. Reviews of the game was favorable and the game won awards in different indie game contests (Key & Kanaga, 2013). Interesting to note is that the reviewer for IGN (Grayson, 2013), considers if it in fact is a game. He considers if it could be something else, while also agreeing that by definition it is a video game. Another interesting note is that he states that it is:

> *"It's a joyous experiment in exploration from start to finish – even if it is a very, very short-lived one.*
> (Grayson, 2013)"

Which hints that the initial notion that by decreasing gameplay elements one decreases the time spent on the game, thus increasing them should have a reverse effect. It is also noteworthy how enjoyable he find the game.

For further testing the game was played not only by me, but also by 3 others, 2 males and a female in the age from 20-24. They were introduced to the game and asked to play them for as long as they wanted. While they played I observed their interaction with the game. When they ended the game I asked them about their experience, primarily in regards to what they liked about it and why they played. None of them had played nor heard about the game before testing.

All 3 expressed that they liked the game, that they enjoyed the sounds and that they desired to see what they would meet in the game. However all of them also only played around 15 minutes before expressing that they were satisfied with their experience. They also tried to use conventional wisdom by trying to open doors to a house they found, which the game does not allow.

The actual events in the game are few, with ground animals that will flee from the player and airborne that will ignore the player. The only actual change in the game takes place when a circle of light appear on the

ground - if the player steps into this circle time will move forward in high speed and the season will have changed when the players steps out (figure 12).

Figure 12 - Ingame Screenshot

This seasonal change seemed to motivate a new interest in the players to explore, though the interest died out again fairly fast.

Summary of findings:

An indication as to the limits of a game founded only on a few gameplay elements, however also shows how these elements while similar attract different attention pending on their color and size.

The importance of the element of sound in the game, as they according to all test persons added enormously to their experience.

And finally the changing world, due to the game element of changing the seasons. Doing so made the scene appear different thus creating additional interest in exploration, thereby giving a temporal boost to continuation desire - Thus by changing the circumstances of the world one can increase the interest in playing, even if the environment remains similar as before.

5.2.4 Thirty flights of loving

An entirely different game than Proteus, this game which is also an indie game developed by Blendo Games (Blendo Games, 2013). The game bases its entire premise on telling a story, where the player is more a watcher following the action than an actual participant. The whole game can be completed in very little time and is completely linear. One can interact with objects, jump and move around. However any interaction will always lead to the same outcome, doing something else than what the game asks will have no effect and lead to a standstill. The game will cut from scene to scene as one move about in the world.

The game was praised for its narrative with reviewers sayings:

" I get a proper mystery at the heart of the adventure, and I get a narrative told with peerless style, through jump cuts and proper choreography, and on a realistic scale, for once, where every death can feel significant, and there's no ludo-narratological dissonance *(yeah, I borrowed that phrase from the guy who wrote Far Cry 3, and he didn't like it either).* (Donlan, 2012)"

In addition to myself this game was also play tested by two others, a male and a female between the age of 21 and 23 with mixed reactions. As before the test subjects was asked to play the game while I observed their progress in the game. After the game ended they were asked how they felt about the game. The female test subject felt confused and didn't like the game - stating that the jumps from scenes to scene disturbed her and she didn't understand what was happening. The male test person was observed to be confused while playing, clearly trying to take a more active part in the events than the game allowed, however upon finishing the game, said that he liked it in some way - stating it was like a movie. Both expressed no desire to replay the game. Both test persons also spent less time on the game than it was the case with Proteus. The game itself features numerous game elements with no direct influence on the story or the game. One can for instance peel an orange, which is perhaps the most interesting thing to do in the game - as it is the only action in the game that actually leaves a trace and one can control. Everything else just happens.

Figure 13 - Ingame Screenshot

What can be learned is that the hints of story clearly brought some interest to the game, however it is also evident that the lack of any real control over one's avatar and the lack of truly understanding the story reduces the interest in the game. Therefore just focusing on a story and less on how the world is made and what the player can do to influence it, creates a very short game - however with an increased focus from the player on the elements, in a desperate attempt to gain more control. The game also have an interesting way of introducing the controls, that has become integrated into the game, creating easy instructions, that was popular with all test subjects (figure 13).

5.2.5 Hitman Absolution

Hitman Absolution is the fifth game in a series about a hired killer, with each game focusing on stealth and a multitude of approaches to complete the assigned goal, usually consisting of one or more targets that should be killed. It is developed by IO Interactive and published by Square Enix (IO Interactive, 2012). In the game the player is introduced briefly with whom the target is and hinted at certain approaches one can take in order to accomplish the current scenes goal. However how one goes about it is fully up to the player, and any method is valid as long as it accomplishes the goal is counted as a win. However a variety of events for completing it is implemented in the scene and certain things will be considered a better approach. The

game rates the player upon completion of each level and ranks him/her according to how stealthy and effectively the mission was accomplished.

Figure 14 - Ingame Screenshot (notazero)

This method of gameplay creates an intriguing challenge to the player by giving the freedom of action, however one is both introduced to the gameplay and approaches as to how one can go about playing the game (figure 14). It works well as game that functions with highly controlled environments where the "freedom" of the player remain bound in the game and thus almost anyone can no matter skills proceed in the game. The environment features multiple objects that can be interacted with and used to create different approaches for the player. This approaches changes the elements from part of the scenario and instead makes the player consider what the elements in the environment actually is. Each level can be replayed as many times as desired before moving to the next level, and often one will do exactly that to reach the desired outcome, due to the challenge aspect of the game or to bring about a desired possibility.

Thus the individual events and possibilities that make up the game ensures a lot of replay ability and the challenge of the perfect approach stimulates the players interest in playing the game. According to the process of engagement a challenge is part of what ensures continuation desire and this also shows in Hitman where the large replay ability is exactly due to the multiple challenges one can meet pending on the approach to solving the goal. These multiple approaches is also thanks to the diversity of the game elements involved in each scene, hence indicating how the use of similar objects creates differences in the experience.

5.2.6 State of the Art - Summary of findings

In accordance with what was discovered useful for each of the four games the following can be noted:

Far Cry 3	Proteus	Thirty Flights of Loving	Hitman Absolution
Compelling open world, allowing the player to explore and interact with it. Lack of any obvious interaction seems to discourage players from playing for longer periods of time.	Compelling music that interacts with the scene and a changing environment. Little meaning of most game objects.	A visual story told in bits helps to engage the player. The lack of interaction is discouraging and items without function subtracts more from the experience than it adds.	The various events created from interaction with the game elements creates challenges for the player and urge to explore alternative options. It allows them to form their own sub-goals within the given objectives.

5.3 Requirement Specification

Based upon the findings in the research, a list of requirements can be formulated as the following:

- The test world is to be open and free roam to facilitate a desire to explore or navigate the world, thus satisfying the curiosity of the player and create opportunities to observe the player encounter different elements of the environment.

- As far as possible care should be taken not to create the testing environment in a way that is likely to result in the player being lead on purpose.

- Given the results of the research into games and the conclusions drawn as to what a game should contain it must feature a multitude of different elements, in the form of e.g. challenges, events, units and scenario objects. In addition the use of a soundscape is indicated to be an effective way to improve upon a game experience that again would create more realistic circumstances for the players when they play, as such requiring the addition of game music.

Using these conditions in the design process should ensure the creation of a game that can be used as an effective testing environment.

6 Design

The purpose of the design is to ensure that the findings of the research effects the design decisions. It is also part of the design to explain the appearances of the environment in relation to the chosen historical period.

6.1 Game Description

The game will feature an open world that aims to illustrate a natural environment that a native American of the prairie might experience when he was alive. It will feature large grass areas with few trees to indicate the scenario of the prairie. It will also feature a forest and an area of snow covered mountains, to simulate different landscapes that the native American travelled.

The game will feature a selection of events and creatures based upon nature and the native culture.

The prairie will be populated with bison's and the player will be able to discover a native encampment, in addition to hidden items and other locations. The forest will have animals native to the forest and animals hunted by the natives, such as rabbits and turkeys. The snow covered mountains will be almost empty of animals, with the exception of some of the native large cats that lived in the area. It will also feature a cave that can be unlocked by some sort of puzzle.

The soundscape will be made to illustrate the wild nature surrounding the player and will also feature music associated with native Americans. Finally different events can occur; wolves appear and attack, one can discover items and explore interesting locations. However the events will only be present in certain iterations of the game.

The game will also allow a sense of rewards to further support feelings of accomplishment, as the game will track certain events and react to them. One such is counting the kills the player performs, to give an incentive to continue. In addition when the game is ended the player will be able to see a list of accomplishments - however the player will not be informed about this during testing, nor how they can be achieved in order to avoid directing him/her.

6.2 World Creation & Inspiration

The setting for the test environment is preselected in advance. Using a historical setting of the native Americans as the base of the testing environment, both for their recognizably and simplistic life, but also due the options it gives for creating an open environment. Which would allow the player the most freedom

and likely more chance for observing how the players acts and move. In addition the use of native Americans allow me to place the player in a natural environment without the need of cities and machinery that could complicate creation. In addition no goal will be given the player to avoid influencing their free movement and acting inside the game world. Thus the result should be a testing environment that works as a game and is created based on game theory and design recommendations (Sylvester, 2013), but tries to do little to consciously influence the players interaction with the game.

The primary source of inspirations was pictures from that time and native designs. The books Trail Driving Days (Brown & Schmitt, 1952), Fighting Indians of the West (Brown & Schmitt, 1975), 261 North American Indian Designs (Orban-Szontagh, 1993) and A Pictorial History of the American Indian (Farge, 1956) served as the source material providing inspirational pictures for the layout and the elements occurring throughout the game.

The game itself will be made with the Starcraft 2 editor (Blizzard, 2010) that features tools to assemble large terrains and models to create an interesting environment. It also allows one to control any aspect of the game and it is freely available to those who have bought the Starcraft 2 game. It also counts in its favor that it is similar to an earlier editor also made by Blizzard that I am accustomed in using, thus ensuring adequate ability to create the environment and the events as intended.

6.3 Features of Iteration

The game is viewed from a first person perspective, with the option to change to a third person view. The game will consist of multiple iterations featuring a variety of events and game mechanics in order to test the influence by adding and removing the game elements. Furthermore the escape button will serve as an exit so when pressed the player indicate that he have played enough and ends the experience.

- In first iteration the player is only able to walk around and explore the world as an observer with no effect on the game.

- In the second iteration the player is granted the ability to run by pressing shift. In addition the weather can change and animals in the game world will react to the players presence.

- In the final iteration the player will be able to run, jump by pressing space, engage in combat with animals and kill them. It will be possible to encounter another human and interact with him. One can collect items and use them, including the ability to ride a horse. The player will also be able to die.

7 Implementation

An implementation is always bound to experience problems with the result that design ideals might not function as intended. During the cause of the implementation the game went through 11 different stages, with various features being added and tried. Several versions of the game world were created attempting to replicate the source material. In the final version most of the intentions had succeeded, with the environment following the design layout as closely as possible, and successfully creating the intended open world (See appendix - Video files). In addition it featured the first person perspective and showed the respective items as part of an UI when they was selected. However when native music and sounds for certain animals were imported into the game, they vanished and the sounds that had worked on an earlier version of the game also failed to work, with the exception of a single sound.

Therefore the game did originally not feature the desired soundscape, but instead relied on pre-existing sounds in the selected editor to mimic the sounds otherwise intended. The lack of visual UI was annoying, but as it was not part of the design originally, it was of less importance. These problems with sounds and the UI were fixed at a later date and they do not appear in the present version.

8 Preliminary Test

The outcome of the preliminary test could help determine how the created test environment works as a test setup. In addition it is meant to give data about the player reactions, and by judging the data to narrow the scope of the study. Finally the results will be used together with additional tests as part of the grounded theory method, however the coding will first occur at that time. Instead a more general look of the results should lead to conclusions about game elements.

8.1 Target Group

Given the objective to study players in an open game environment, with the purpose of discovering and analyze reactions to game elements, the target group could be anyone that play or have an interest in games of any genre. This is due to the purpose of being able to lay the foundation for a framework that would apply in general terms to games - however only to indicate the influence. For instance a specific sample of test subjects would be required for further testing to generalize and specify potential influence for different types of games.

8.2 Questionnaire Setup

The questions are meant to discover why the test persons played the game, how they experienced the game and to give an understanding of their reactions. The questionnaire asks a series of basic demographic

questions such as gender and age, but more importantly what type of games they prefer playing. Then it continues with a series of open ended questions as they provide specific individual information, that is to give a better understanding of the player as opposed to more restrictive questions such as yes/no questions (Ballou, 2008).

Among those questions they were asked to recall events, consider if a story was present and if there was a goal. They were to write why they thought as they did. The purpose is to establish what elements appear to have made a conscious impact and compare it to the observations. The questions of the questionear can be found in the appendix.

8.3 Test Setup

The test takes place by first introducing the test person to the game, stating that he is free to do as he wants in the game. The controls of the game are then explained, and the player is told that whenever he feel that he have had enough with the game, he is to press escape and the game will end, and otherwise he is free to play as long as desired. While the test person is playing he will be observed and patterns in the test subjects movements will be noted, as well as differences in behaviour.

The test person will play the game twice, one for each iteration - with added elements in the second play-through.

Upon finishing the game the player will be presented with the questionnaire.

8.4 Participants

The participants of the preliminary test were selected by use of convenience sampling and consisted of 19 males (76%) and 6 females (24%). The average age was between 21-25 years. They reported playing the following genres (multiple choice): 50% Role-playing Games, 40% Adventure Games, 25% Strategy, 15% First Person Shooter, 5% Puzzle, 25% Simulation and 25% Casual.

8.5 Results and Analysis

The data gained from observations and the questionnaire responses yielded a multitude of results which were filtered by discarding answers and observations not relevant such as null replies. Negative responses without any explanations (such as only 'no' or 'died') were considered in a quantitative sense to indicate if the overall effect of the game element had worked as intended, as opposed to how positive responses, that

could form part of a qualitative analysis, aimed at an increased understanding of user reactions and game elements.

As the players navigated the environment, their movement was observed. The observations indicated patterns as depicted in figure 15, which show a general tendency for the users to move toward green areas and water, avoiding the central prairie until the first green area had been traversed, as well as following along cliff sides. A majority of the test persons cited exploration as the reason they continued playing.

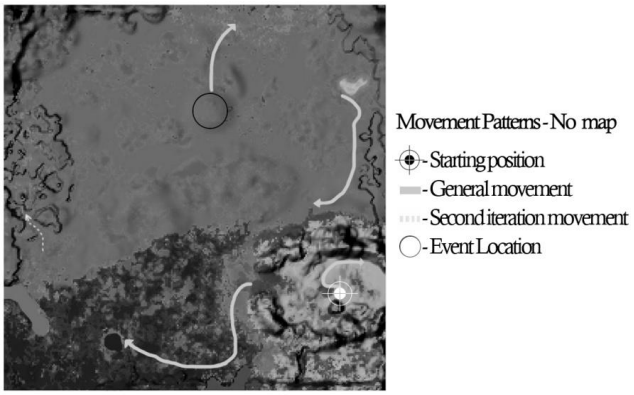

Figure 15 - Map of the testing environment - with user movement patterns.

As the test consisted of iterations with a different amount of game elements available, it was observed that allowing the player to run made the user play longer and covered more of the game world. In a similar fashion making the test person able to jump was observed to make some test persons try to jump on some flat rocks. Indicating that they believe that the environment had become more interactable as well, likely due to preconceptions from other games.

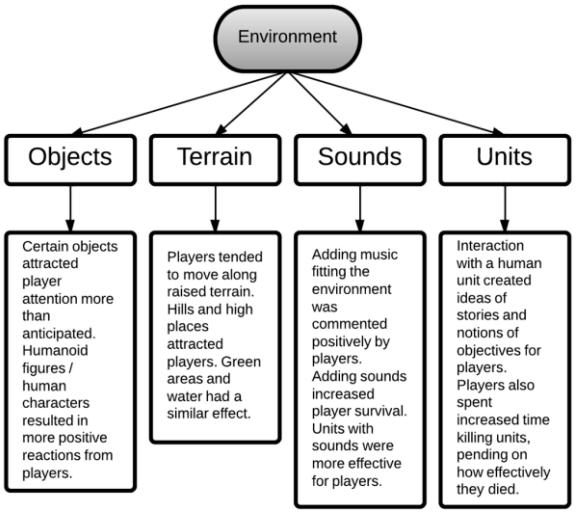

Figure 16 - Findings about the environment

In the responses and observations it was noted that players who interacted with the only human character in the game played longer, and that several of those who interacted with him believed that he had given them an objective. This fact that they played longer also indicates that that by removing goals one is also removing a large part of the game. Meaning that players will spent much less time playing the game if they

have to create the goals themselves, which is somewhat interesting given the hours one can use in games with stated goals, but with free-roam.

In a similar fashion most of those who considered that the test environment featured a story, also based it upon the human figure (figure 16). Another observation was that several players were attracted to a specific cactus, which was just meant as part of the scenery - likely due to its shape.

In that regard game objects, such as the human character, turned out to have a large influence on where the players went in the open world. In a similar fashion the players were observed being attracted to certain objects and to follow moving units.

The important findings can be summarized as:

Navigation: Users follow patterns when they move in an open-world environment, shown by the similarity in the routes the users were observed to travel. They are influenced in the form of attraction by objects otherwise not meant to attract that much attention.

Environment: Objects can have an influence beyond the intended scope, such as part of the nature in the environment that attracts attention. This influence appears to be based upon the placement and shape of the object. In addition some objects were perceived to have additional functions that they did not actually have, assumedly due to the user's knowledge of others games with similar objects - making the players try to use them as part of their exploration.

Goals: are important to keep the player playing. Hence measure should be taken to make it easier for the player to create his own goals.

8.6 Conclusion

The testing environment itself have proven effective, with several commenting that they liked it. However it also shows that the theories for making the players play the game hold true, judging from the responses to the questionnaire and the measurement of the time spent playing. No stated goal was present and the game in itself did not do enough to allow player created goals. In addition measures should be taken to prevent so many test participants from dying, resulting in a short test. In addition it has also shown that one of the clearest ways the game elements influence the player is in regards to how they move. Meaning that the players were observed moving towards objects that caught their interest, and in similar ways they tried interacting with some of those objects. In addition the cliffs, water and color of the terrain seem to have a large influence on the patterns the players follow when playing the game. This would mean there is

a potential in controlling player navigation using game elements, such as ordinary terrain objects. Hence it would make sense to focus on navigation in the final problem statement.

9 Final Problem statement

Given the explorative nature of this study, the aim of the problem statement is to limit the project in scope. This limitation is based upon the discoveries made during the pre-analysis. Thus in line with the focus suggested when considering what have already been done, the project was limited to consider objects and events. The state of the art and the studies of games have confirmed the effectiveness of open game environments as a game world. It has been made clear that while goals serve as a motivational factor in games, it is not a required feature as players can create their own goals and still enjoy playing a game without a specific goal. In addition the influence was limited to considering navigation due to patterns observed during the preliminary test. Therefore the assumption that one removes some potential bias about player navigation when avoiding goals can be tested, as the testing environment would still be able to function like a game, even without a specified goal. Thus the final problem statement is:

How would player navigation be influenced by game elements in the form of events and objects in a non-goal oriented open world game environment?

10 Methodology - Grounded Theory Method

As the grounded theory method is the chosen method for this study, it is important to consider in depth what the method actually entails. It is a systematic method that involves the creation of theory through the analysis of data.

This analysis known as coding is one of the important features of grounded theory. In its basis of consists of its 3 elements; 1)code, 2) concept, 3)category and theory. Where code is the gathered key points of the data, concept means the content from the data that can be grouped, and categories is a collection of similar concepts. The categories are what generates the theory. Those elements are the results of constantly looking at the data and comparing, as the data collection runs alongside data analysis.

A simplified relation of analysis and data gathering (Hodkinson, Grounded Theory and Inductive Research, 2008):

1. Initial data collection
2. Initial data analysis

3. Focused data collection
4. Further data analysis
5. Refinement of theory

This approach comes down to coding, sorting and organizing the data, and then collecting those that are similar. There are three main coding procedures; Open coding, Axial coding and Selective coding (Liamputtong & Ezzy, 2005).

Open coding involves looking for similarities and differences between the codes, be it events, action and interactions. It then applies conceptual labels to those and group them into categories. It can be considered the first coding, looking at the data in a new way and create new way to describe the relationship between the data.

Axial coding comes after open coding, and attempts to specify the codes by putting the categories back together in another fashion and by doing so make new connections between a category and sub-categories. It ensures that each code is fully elaborated and delineated.

Selective coding is the process where the other parts are unified to maybe identify a central core category, though the notion of a central core code is opposed by some that find that one should instead make interpretations. (Clough, 1992).

The method have received criticisms as neutrality is expected and this ability to remain neutral is believed impossible and as such has been called "the god trick" (Haraway, 1991). Some have criticized it for having limited explanatory power (Layder, 1993), while others again argue that the coding can end up resulting in a loss of the depth potentially found in qualitative data, due to the codes losing their original location. As such they are treated out of context, which could result in lost significance and meaning of the responder's stories (Riessman, 1993).

As earlier mentioned, it was decided to use the approach of having a literature review before data gathering, in order to gain understanding of the game environment - in order to create a better test. This deviation is something others have had success with before (Hodkinson, 2002), and should as such not be problematic.

11 Design

11.1 Changes to test environment

Based upon the conclusions from the preliminary test as to the effectiveness of the testing environment certain changes was required to the test environment in order to reach longer playing times and thereby gain more options for data gathering.

The test concluded that players were dying too often, a results of the conclusion made in the pre-analysis that players had to have an element of danger. However as the players are unable to see how close they are to death, there is in fact no need to make them able to die. As long as the players assume they can die and they get attacked, they will still experience the 'threat'.

Another problem was that lack of a goal caused players to play for shorter periods of time. In order to solve this problem and in line with the problem of navigation a map is introduced into the game. The map will appear if the player press 'M' and can be removed at any time. The player's location will not be marked on the map to contain the explorative nature of the game, and avoid players walking only looking at the map. They will also first be introduced to the map after a certain period of time have passed. The players would then be able to view the world and give themselves goals in form of locations they want to reach.

Finally the player character in the game was updated to be in possession of an item (an axe) from the beginning, such that players that missed the item near the starting location would still be able to interact with the animals in the game and have some action to perform other than movement, which again is to ensure that the player is more likely to react as if he had a goal.

12 Design of test

12.1 Target Group

The target group remains the same as in the preliminary test, and will for the sake of comparison also use a convenience sample from the same location as the former test.

12.2 Questionnaire Setup

The questionnaire primarily consists of open-ended questions based under the notion that they would yield more useful data (Ballou, 2008) in relation to create an understanding of why players acted as they did in the environment and how they for instance perceived their own navigation in the environment. Furthermore using open ended questions fits with the coding process of grounded theory. The players were also asked a few quantitative questions to establish the demographics of the test persons, such as age,

gaming genre and gender. Doing so allowed for some more comparative data. The questions are meant to discover what the test persons recalled from playing the game, how they experienced the game and finally if they had any reason to navigate as they did in the game environment. The questions of the complete questionnaire can be found in the appendix with the results.

12.3 Test Setup

As before, the test takes place by first introducing the test subject to the game and its controls. The players are asked to think aloud (Boren & Ramey, 2000) by voicing their thoughts as they progress through the environment in order to learn more about what the players are thinking while they are playing, as opposed to only learning their thoughts after the experiment is finished. Thinking aloud is a commonly used method for usability testing (Van den Haak & De Jong, 2003), and can verbalize data about reasoning during a problem solving, which makes it useful in this case to gather additional data. The method is also preferred compared to other methods with similar goals, such as a teaching method which is suggested as a better alternative to the thinking aloud. But as it for instance requires extra time and that the test person demonstrates the test environment to another person, it does not fit the purpose of the test even if it is claimed to give more verbal data (Voraa & Helander, 1995).

Finally the players are informed that the test will end when they press escape and that they are free to do so any time they want.

While the test person is playing he is filmed to allow for later review and observations. Furthermore audio is recorded separately to ensure that eventual thoughts spoken aloud is captured. After playing for about 5 minutes the test person is informed that he/she can press 'M' to view a map of the environment.

Then upon ending the game, the subject is asked to answer a questionnaire about the experience - stating reasons for reactions and general demographics such as age.

13 Results & Findings

13.1 Participants:

The participants of the preliminary test were selected by use of convenience sampling and consisted of 9 males (ca. 82%) and 2 females (ca. 18%). The average age was 22 years. They reported playing the following genre's (multiple choice): ca. 54,5% Role-playing Games, 54,5% Adventure Games, 72,7% Strategy, 45,5% First Person Shooter, 9% Puzzle, 27,3% Simulation.

13.2 Noteworthy results

Only some of the results shall be written here, as the majority of the interest is in the process of coding that also covers findings from both observations and questionnaire.

8 of the 11 participants thought they had a goal, and out of those 5 related it to the map.

Time spent playing significantly increased from the preliminary test.

Most of the participants did not give any conscious thought to how they navigated before being able to view the map, however one notes that she just followed the natural terrain (an observation she also made when speaking out loud).

6 out of the 11 believed that there was some sort of story, with two being aware of formulating their own based upon the experience.

13.3 Findings

In this section the results from the final test will be listed and coded and compared in accordance with the method described in the chapter about grounded theory. The codes themselves will not be shown in their entirety, but instead the concepts and the categories that resulted from them. As an example: in the questionnaire those who marked role-playing as a gaming preference, were assigned the code RPG, this was then compared to those who had been assigned the code of 10 - meaning those who played for more than 10 minutes. The result was the concept that players in favor of role-playing appear more willing to spend time exploring. A similar process occurred for each concept - the approach is the before mentioned open coding, that focuses on comparing and assigning a conceptual label.

The following table shows the concepts and from where in the data it came from:

Concepts	Questionnaire Data	Observation Data
Player in favor of role-playing appear more willing to spend time exploring.	With the exception of one, all who marked RPG as a type played more than 10 minutes.	All noted RPG players was observed trying to interact with the environment, looking closer at plants and moved around a lot in the map.
Objects not discovered by the player creates little impact and is	Only one makes a remark about the axe, and that is in	The players are observed trying to use the axe to interact with plants

less important.	connection with another reply.	and it is used quite a lot while they are playing.
Players act on some similar instinct when they navigate the world, before being able to view the map.	Only one noted a thought moving pattern, not related to the map.	Players was observed to move in similar fashions. One remarked that it looked like a path was made for her on purpose.
Aggressive animals apparently make a bigger impression than the most frequently killed	More people remarked upon the wolves and snakes than the bison.	Players was observed to be more conscious of the snakes rather than the wolves.
Players has some instinct in regards to certain plants.	No player notes anything about plants.	Several players paid extra attention to certain plants in the game and moved toward them.
Players are making an unconscious connection between an axe and the act of chopping plants.	No player notes anything about it.	Several players when equipped with the axe, tried to cut down plants. No players tried interact with plants using any other weapon.
While killing satisfied the player during play, it does not create much of an impression.	Killing is mentioned by only 3 test persons as something they recall or as reason why they played.	Players is observed to pay attention to the kill score and spent a lot of time killing.
Could indicate that players used to adventure games are easier to engage in that type of game environment.	The player notes adventure games as his only preference. Also notes both a story based on his actions and recall regret about losing his horse.	The player was observed killing and having a hard time navigating the environment.

Players that concentrate on exploration, and not on any potential story appear more likely to be attracted by game elements in the game.	All 3 players marked RPG as their genre, liked to explore and are 3 out of 4 who did not believe there was any form of story.	3 players was observed to have noted and acted upon the same object as in the preliminary test
The human figure does not attract the same attention as something the players can kill.	Only 3 makes a mention of him.	Meeting the human was something many took an interest in when they first spotted him.
Players react towards objects that looks different from the rest, perhaps moves a little.	Players only make a mention of the houses, not the natural elements.	Players was only observed attracted by plants that stood out somewhat from the others, be it by shape or form.
Players are attracted by the green environment	Only one player notes that she followed a path.	All players was observed heading into the forest as the first thing.
Players are just going in the direction they are pointed when the leave an area.	Players notes no specific thoughts behind movement before map.	Players are facing the forest when they exit the starting location

As the next step the concepts will be categorized by comparing, deconstructing and drawing similarities between them:

Concepts	Category
Player in favor of role-playing appear more willing to spent time exploring. Players that concentrate on exploration, and not on any potential story appear more likely to be attracted by game elements in the game.	The influence of game elements is more prominent when the test person is focused on exploration.
The human figure does not attract the same attention as something the players can kill. Objects not discovered by the player creates little impact and is less important.	Less interaction makes the player more likely to forget.
While killing satisfied the player during play, it does not create much of an impression. Aggressive animals apparently make a bigger impression than the most frequently killed	The non-aggressive kills does not create memories, it's the type of weapon and the aggressive unit that players recall.
Players has some instinct in regards to certain plants. Players are making an unconscious connection between an axe and the act of chopping plants.	Players do not attempt to interact with nature objects larger than themselves
Players are attracted by the green environment Players are just going in the direction they are pointed when the leave an area.	The different appearance of the forest compared to the prairie and the snow causes the player to be attracted.
Players react towards objects that looks different from the rest, perhaps moves a little.	

The categories will be unified to find the core category that will form the framework. This is done by finding the central element in them that they have in common, also known as selective coding.

<table>
<tr><td>Category</td><td></td><td></td></tr>
<tr><td>The influence of game elements is more prominent when the test person is focused on exploration.</td><td>No interaction on game elements that facilitates exploration</td><td>Core Category</td></tr>
<tr><td>Less interaction makes the player more likely to forget.</td><td></td><td rowspan="5">Game elements and objects that appear different from their surroundings attract the player, however to create a subtle guiding, it should not contain any interaction.</td></tr>
<tr><td>The non-aggressive kills does not create memories, it’s the type of weapon and the aggressive unit that players recall.</td><td>The interaction close to the player creates an impression</td></tr>
<tr><td>Players do not attempt to interact with nature objects larger than themselves</td><td rowspan="2">While large objects attract the player from distance, it is the smaller different ones that attract close inspection.</td></tr>
<tr><td>The different appearance of the forest compared to the prairie and the snow causes the player to be attracted.</td></tr>
</table>

13.4 Limitations

The primary limitation of the findings is the low amount of test participants - and that they had a fairly similar background and age due to convenience sampling. Therefore one would need to test on additional people using the same test environment and redo the process of analysis coding. Doing so could lead to a more qualified framework. Then in order to create more specialized theories, one would need to target specific groups of experienced as well as less experienced gamers and test if similar and generalized results can be gathered. Many of the results are based upon observation and only some of the reactions observed have been directly explained through the questionnaire. In other cases it cannot be known with certainty why the users acted like they did, hence the risk of faulty interpretations of the observations. Another limitation of the study through the interpretation of answers to open-ended questions that might be biased by the researcher, a problem which could be addressed by performing additional tests testing these interpretations, or to let other researchers analyze the data for comparison. The think aloud method did little to yield useful data that could be compared to the observations, as such another approach would be required to get a closer understanding of the player actions.

In addition it is important to consider that the results gained in the test environment might not be the same with different games or interactive storytelling applications, hence additional testing with other game environments and combinations of different variations of the game elements would result in more validated data, that can be used for general conclusions.

13.5 Comparison with others

As this study deals with player interaction with game elements, it touches upon why players play games (Salen & Zimmerman, 2004), and it is evident that many of the results in regards to the pre-analysis is similar in manner to those gained from concepts of flow, immersion and engagement (Csikszentmihalyi, 1990) (Jennett, et al., 2008) (Lombard & Ditton, 1997). These concepts are very relevant due to them being the result of activities that the player goes through, and as these ideas are part of the inspiration for the elements of the game environment, they serve as an effectual layer, with the specific game elements creating the activity. For instance a challenge is considered to be a necessary component of these concepts, with the challenge being made of game elements that would benefit from more knowledge about the way a layer can be attracted by game elements. However it seems like the specific elements used to create the proposed events and activities associated with game enjoyment and successful game creation are seldom

documented in the literature. The relation between mechanics and fiction is an often discussed subject (Murray, 2005), and writings about mechanics are approaching the subject of interest, by considering the effectiveness of the game in relation to having an object such as a box to block e.g. a sniper (Sylvester, 2013). However these considerations of the mechanics are related in practical terms and do not consider potentially side effects e.g. a stack of boxes, would have as opposed to using a stack of barrels. While it might appear as a miniscule difference, this study have shown that there is a difference in how the players act towards game elements. For instance relying on pre-conceptions from others games, such as trying to jump on flat rocks. However a variety of plants gathered unexpected attention. In the area of game elements a study has shown that there is an effect related to colors present on the screen when playing (Wolfson & Case, 2000), thus not making it unlikely that a correct combination of colors and shape would affect the player in different ways pending on the combination. In fact these considerations of elements are similar to how music has been shown to be important to a game and one of the effective elements for games is exactly music that has been shown to have a huge impact on the whole atmosphere of the game (Collins, 2008). In addition it goes in line with notion of environmental storytelling, where the environment is telling its part of the story (Jenkins, 2004) - thus the elements of an environment can play a more substantial role in telling the story, coming close to how elements of the environment has an influence. However the studies of environmental storytelling have not considered game elements in depth, but instead deal with more overall notions of the environment.

In addition player reactions and movements in the environment can likely be related to studies into human psychology. The results - such as the players tendency to be attracted towards certain areas as opposed to others - could be an unconscious behavior to e.g. remain oriented in the world (Kaplan, 1987). Either out of fear for getting lost, or due to the lack of hiding places. Such possible fear responses can also be observed of how players react with a survival instinct when faced with enemies of a dangerous nature inside the game (Phelps, 2006). However these reactions were also clearly susceptible to change pending on the situation of the player; when provided with a map, the pattern of green areas and following cliffs vanished, when given the option of increased speed (such as riding) it seems like the players became less nervous about traveling and more frequently traveled into open spaces. Discovering new items increased player confidence when faced with danger and served as a motivation by allowing the player to "progress" in the game (Schoenau-Fog, 2011), and at the same time changed how the player viewed the game - in effect "changing" the world from being potential dangerous to a playground. The notion of progression in games, for instance by allowing the player to access better and better equipment is an often used and well-known method and is in some cases almost the sole driving factor of a game, as is the case with Diablo 3 (Blizzard Entertainment, 2012) where the story serves more to create a background for the game to progress along,

rather than actually driving the player forward. But instead it may be possible to make this mechanic a part of the story, by putting more consideration into how this progression occurs and change the elements.

This leads me to consider the core category, which can also be considered the framework: Game elements and objects that appear different from their surroundings attract the player, however to create a subtle guiding, they should not contain any interaction.

The overall parts that were involved in the creation of the game were based upon research of emotional triggers by using the physiological responses of humans to create the game experience (Sylvester, 2013), however this overall reflection did not decide each individual game element making up the environment that the player encountered. As such it is interesting to note that no research was discovered that related to something similar to that framework. This study does not claim to have discovered this influence, especially since it will likely be dependent on the element in question. However that is not the aim of the study, instead the result is to be used un further research to increase our knowledge about the subject - which in turn could be used to propose that certain elements meant for similar use, may not provide the same experience (and thus play differently in story construction) and could affect the efficiency of the activity or narrative. An example of such would be how players responded to the human character in the game world, where he was perceived to be both involved in potential stories and as a quest giver, without being neither. This indicates that using humans or at least units associated by the players as humanoids will be more effective when telling a story or giving an objective to the player, than a static object, however as this study shows they might serve as a way to subtle guide the player in an open environment. Though due to the limits already discussed this cannot be confirmed with any certainty and is instead to be considered a framework that will be the foundation for later testing purposes. However it is evident that the narrative of the game can be influenced by elements, and thus they can arguably be used to improve or support the narrative, not just in the sense of fitting the scene - but also in regard to their actual appearance.

Creating an activity considering purely the environment of the game and the mechanics of the activity, without taking into account what specific elements is used to create the activity or support the story, would if the object fitted the framework lead the player to react in an unexpected manner. For instance an object meant only to be part of the background might attract the player due to its shape or color, thus potentially spoiling some of the game experience for the player by distracting the player from important observations or information. Instead a conscious use of the influences that made players follow patterns, and use of the attraction some game elements offer might lead a more subtle guiding of the player, with potential to avoid the risk of effecting the story in order to ensure that the player notice it, trough for instance the use

of cut-scenes. Though doing so would require additional studies into the discovered framework and player actions to discover exactly why they moved as they did.

14 Conclusion

Using the grounded theory method to code and analyze the data, the following framework was created: Game elements and objects that appear different from their surroundings attract the player, however to create a subtle guiding, it should not contain any interaction.

Which directly suggests that game elements and objects that does not have any specific functions other than their appearance still can have an effect on the player, and attract him. Furthermore it suggests that the point about no interaction is part of the game elements use, because while allowing an interaction might ensure attraction by a player wishing for that interaction it could also lead to the object taking priority. It should also be clarified that this applies to open game environments. Assuming the framework is true, that means that one can avoid the risk of an game element taking a bigger place than intended, and still use it to move a player around. In addition this use of 'forgettable' guides could be used in conjunction with emergent narratives and storytelling in order to attract the player to important areas, while not confusing the player as to what object that is important. However for this to become reality more work is required, as the point of the framework is to form a foundation and not provide any confirmed theory or method. Instead it should be seen as an indication that there is something about the subject and what route this attraction might take.

Further studies with additional target groups, various experiences and more test subjects could lead to the creation of guidelines to follow, in order to understand if the proposed framework can be used and if so, how to relate it into a method for subtle guiding in video games.

15 Future Development

The framework itself requires additional research, with more testing and thereby more results to code from which might result in changes to the framework. In addition others doing similar experiments and ending up with equal results would help prove the validity of the framework. In addition the framework should be tested in a more scientific scene in a test setup made to test the framework.

Looking at the results from the coding process indicates several interest concepts, not counting the framework itself. Such as: 'Objects not discovered by the player creates little impact and is less important.'

This could mean that it is a more effective approach to allow the player to acquire his or her own equipment or other possessions. Doing so might allow the player to be more interested in them and thus also remember them better. Further research into this might uncover ways to makes players less likely to forget possible options in games - such items that could give extra information if used - but is not located in frequently used location. Or 'Players are making an unconscious connection between an axe and the act of chopping plants' which indicates large presence of reactions based upon common game features, that might be utilized in new ways, pending further studies into what for instance the most common preconceptions would be.

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