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Why We Keep Playing Computer Games

A Theoretical Investigation of Human Motivation, Player Motivation and Fun in Computer Games

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Abstract

Formålet med dette speciale er at undersøge emnet vedrørende motivation i computerspil, og hvordan motivation kan kædes sammen med de fundamentale psykologiske behov vi, som mennesker, har. Derudover er det målet med specialet at komme tættere på en forståelse af hvad mennesker finder sjovt i computerspil og hvordan det har indflydelse på spillermotivation og designet af computerspil.

Specialet er inddelt i tre hoveddele: den første del omhandler den forforståelse og eksisterende tilgang som specialet er baseret på, samt en undren over hvad man forstår ved begrebet *sjov* i computerspil. Denne undren understøttes med viden om teori-områder, der kan sættes i forbindelse med værdien i en spilaktivitet. Forud for opstillingen af problemformuleringen bliver videnskabsteoretiske perspektiver, i form af fænomenologi, inddraget i samspil med viden om definitionen på et computerspil. Derudover anskues spilaktiviteten og kvaliteten af denne igennem Mihaly Csikszenthmihalyis flow teori.

Den anden del af specialet omhandler teorier vedrørende spillermotivation, psykologiske behov og følelser i computerspil. Disse teoretiske felter bliver opstillet og sammeholdt med analysen af to eksisterende computerspil i forsøget på at kategorisere og diskutere de spilmekanikker og indholdsmæssige kvalititeter, som kan føre til forståelsen af sammenhængen mellem sjov i computerspil og tilfredsstillelse af basale psykologiske behov.

I den sidste del af specialet fremstilles resultaterne af analysen og en model for relationen mellem de psykologiske behov, spillermotivationsfaktorer og spilmekanikker bliver opstillet. Formålet med modellen er at bidrage til forståelsen bag incitamentet for at spille computerspil, samt at fungere som et værktøj til hvordan man i designet af et computerspil kan diskutere de spilmekanikker der inddrages, og hvordan de påvirker spillerens spiloplevelse.

Preface

This MA-thesis was written at Aalborg University, Institute of Communication as a conclusion to the master's degree of Interactive Digital Media in the spring of 2013.

We will assume that the reader of this thesis has a basic understanding of the subject on computer games – otherwise we hope that this thesis will be a worthwhile insight into the world of digital games.

The sources that are used for documenting the thesis will be referred to with (author, year and pages), corresponding to the appropriate source in the bibliography. The appendix contains the theory which we find to be either too elaborate or unnecessary in the context of the main body of the report. Nonetheless, they will be listed in the appendix as a supplement to the understanding of the theoretical points of view in the thesis. Any other material needed for a better understanding of the analysed content in question can be found in the appendix. All images featured in the thesis was used without permission, but are referred to by their source, and all images that do not feature references are made by the authors.

Finally, we would like to express our thanks to our supervisor Nikolaj Hyldig, who helped us as much as we could be helped during the course of the MA-thesis. It has not been easy journey for us, but we thank you for your patience and the time you dedicated to us.

Enjoy the thesis!

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1 Introduction

"It is games that give us something to do when there is nothing to do. We thus call games "pastimes" and regard them as trifling fillers of the interstices of our lives. But they are much more important than that. They are clues to the future. And their serious cultivation now is perhaps our only salvation" (Suits, 2005, p. 159)

The abovementioned quote has made us think about what games are and how we approach the design of them. There are many incentives for designing games: some might be seen as bad (pure monetary gain) and others might be viewed as beneficial (helping people learn and improve themselves).

No matter the reason for developing a game, there will always be an audience which you will need to catch the attention of. If a game does not cater for the interests of the audience, few will play it. But what is it that players want? Why is it that players keep playing computer games? This is what we would like to investigate in this thesis.

1.1 Press Start to Play

The ambition of this MA-thesis has been to develop a theoretical framework for understanding player motivations and the subject of fun in computer games. One of the objectives is to understand the fundamental human motivation for playing computer games, and how these computer games captivate the emotions of us humans and how they implement this 3in their design to make them fun.

The foundation of the thesis stems from our theoretical work with computer games in both the seventh (Haferbier & Lund-Pedersen, 2011) and eighth (Haferbier & Lund-Pedersen, 2012) semester projects. The thesis is also a further development of the ideas we shared from our ninth semester as game design students at DADIU[1]. As such the thesis is a sum of two and a half years study in which we have gained insight into the world of computer game development, game theory, interaction design and experience design.

Both authors hold a bachelor's degree in Medialogy at Aalborg University (Medialogy, 2012). This degree is based on the studies of human-computer interaction and thus concerns itself with knowledge on human perception and cognition, immersive and intelligent computer systems and new computer interfaces. The degree focuses on academic research that seeks to combine technology and

[1] The National Academy of Digital Interactive Entertainment. A place that educates students in the making of computer games and collaboration between universities and art schools form Denmark (DADIU, 2010).

creativity, and allows for the investigation of the technology behind advanced computer graphics, computer games, animations, electronic audio and music, interactive art and entertainment. The purpose of the degree is to allow students to attain a strong technical foundation, both in theory and in practice. As the description of the degree suggests we have focused on the design and implementation of various computer technology. This means that the use of technical and design theory has been the most common approach - and that the goal of many a project emphasized the creation and prototyping of various multimedia systems, evaluated through user testing. The bachelor's degree in Medialogy can be said to have adopted an engineering approach to research and design when it comes to human computer interaction and computer science.

During the master's degree in Interactive Digital Media, we investigated the narrative aspects of computer games, as well as game design allowing the player-generated content.

In the seventh semester, the goal of the project was to contribute with a theoretical framework of the narrative situation in computer games while offering an explanation of why computer games, in our opinion, is closely coupled with narratives - as opposed to the sources believing computer games to be of no equal or quality to storytelling (Eskelinen, 2001, p. 1). At the end of the project we proposed the following model:

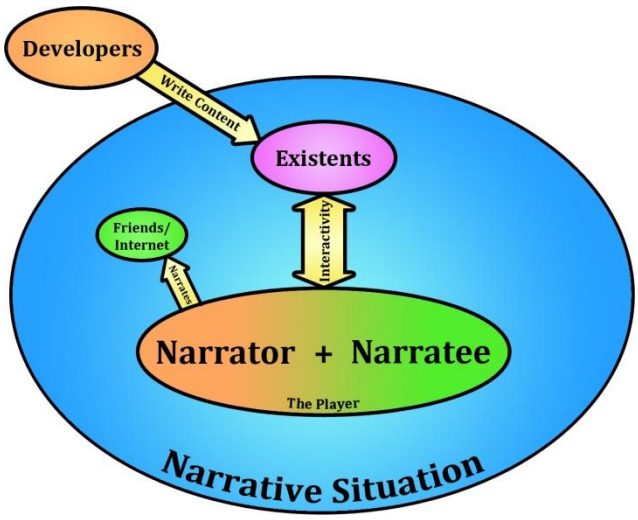

Figure 1: The model of the narrative situation in computer games as constructed by the end of the seventh semester project (Haferbier & Lund-Pedersen, 2011)

The model represents the gaming situation as similar to a narrative situation found in literature (Eskelinen, 2001), and explains how a story is conveyed to the player. By allowing the player to interact with various existents in a computer game (be it NPC's[2] or inanimate objects) they themselves become the driving force of the narrative.

[2] Non-Playable Characters

Without a player to advance in a computer game the story cannot unfold. In that respect, the player is in a sense his own narrator - especially in games with multiple storylines in which players can choose exactly which part of the storyline they wish to explore, thus creating their own unique narrative (Haferbier & Lund-Pedersen, 2011). This, alongside the emergence of a player's own experience in the game as a narrative, is part of what makes computer games interesting storytelling mediums.

In the eighth semester project focus was on building upon our model of the narrative situation to incorporate player-generated content (PGC) in and around games, where content to a certain extent could change the story or experience of a game, thus adding value in the form of forums, wikis and fan art. The model can be seen below:

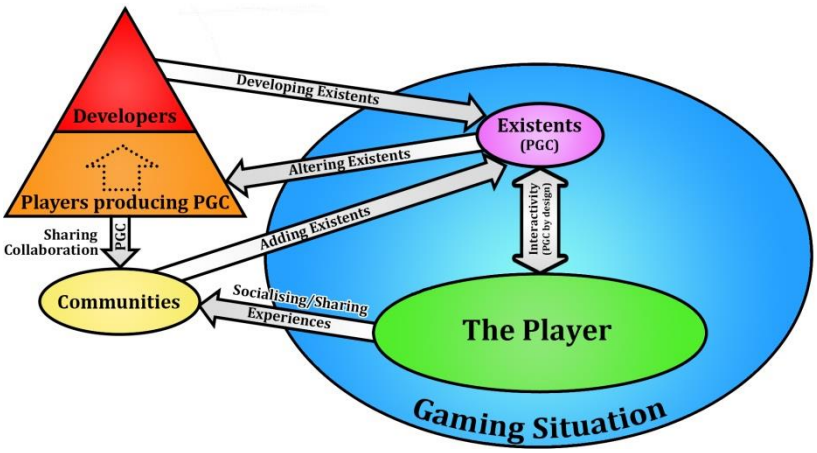

Figure 2: The model of PGC in the gaming situation as constructed by the end of the eighth semester project (Haferbier & Lund-Pedersen, 2012)

In order to assess the level of PGC incorporated in various games - both by design, by opportunity and by intent - a categorization of PGC was created. The conclusion was that the easier it was for a computer game to incorporate PGC, the greater an opportunity there was to add value to an existing computer game. Also, even though a computer game is not encouraging PGC or allowing PGC by default, the popularity of a computer game can foster groups of dedicated players to create content for that game (Haferbier & Lund-Pedersen, 2012).

The ninth semester was a semester project with a more practical approach: Both authors were accepted into DADIU – one in the role of a game designer and the other in the role of a project manager[3]. The purpose of this semester was to grapple with the challenge of creating a computer game in six weeks[4]. Here the primary platform for interaction was the PC, and all intended computer game design was to be

[3] The roles and their responsibilities can be reviewed on the DADIU website: http://english.dadiu.dk/education/gamecompetencies
[4] The final computer games created by the authors are the top two on the list: http://english.dadiu.dk/games/games2012

performed on this platform. The focus of the development was to make a playable and user-friendly computer game that could be tested on the intended target group. Also, it was possible to utilize the knowledge gained from the previous semesters in the process of creating a computer game.

Figure 3: Screenshot from Trail of Regret – a game co-created by one of the authors.

This MA-thesis is the culmination of the previous projects, where the ambition lies in constructing a theoretical framework based on the ideas and knowledge accumulated throughout these semesters. When it comes to the development of computer games, it can often become an effort to design for oneself rather than for the player that will have to pick up and enjoy the game. This is the argument and the reasoning behind attaining deeper theoretical knowledge as a supplement to the practical knowledge of design theory and methods that we have accumulated thus far.

Even though we have been able to construct several models of the interaction with and within computer games, while also benefitting from the practical experience of designing and developing a computer game as part of DADIU, we are still in need of a better understanding of how players are motivated to engage in the games that they play. Is it the visuals, soundscapes or complex storylines they are presented with in the fictional and virtual world? Is it just because games are fun and what can the term “fun” be defined as in this regard? Is there an underlying layer of motivational triggers that we, as aspiring game designers, are not fully aware of?

During the ninth semester the design teams were often faced with the question, “Is it fun?” Inherently, computer games are meant to be fun, as it is their primary driving force, and many members of the design teams at DADIU adopted specific views on what fun in com-

puter games should be. An often cited quote, from game designer Sid Meier[5] is:

"A game is a series of interesting choices."

(Rollings & Morris, 2000, s. 38)

A large number of people held unto this view throughout the whole development period, but in essence many did not know what *interesting choices* entailed. This is an idea that we want to work on with this MA-thesis. Saying a game should have interesting choices require us to figure out what interesting choices is and how they relate to what people find fun to play.

The objective of the thesis is to gather knowledge from various disciplines in order to map out what can be said to be fun and how it relates to the motivation of playing computer games. Therefore, it is important to investigate the aspect of human motivation and what motivates us to pursue the things we do in our everyday life.

1.2 Incentive

We love computer games – in all of their variety. We love to play them, we love to make them (or at least try to), and we love to hear, read and write about them. Also, we can be characterized as avid players of computer games and have been playing games since our early childhood – when we first encountered the world of digital entertainment.

Among the very first experiences with the medium of video games is, for instance, the very difficult platforming video game *Battletoads* (Rare Ltd., 1991) or the driving game *Monster Truck Madness* (Terminal Reality, 1996). At that time, the audio-visual side of the computer games were very different from what can be seen in the gaming industry today, as illustrated in Figure 4. Nonetheless, the play experiences delivered by these games were at the top. They created a sense of novelty which we had never experienced before. Picking up the controller for the NES, and interacting with the virtual world of the martial arts fighters in *Double Dragon* (Technos Japan, 1987) was indeed spectacular and filled with action, as was the piloting of aircrafts with a joystick in *Fury 3* (Terminal Reality, 1996).

[5] Sid Meier is a programmer and designer, and creator of the popular strategy computer game *Civilization* (Wikipedia, 2005).

Figure 4: Old vs new - Wolfenstein 3D (id Software, 1992) on the left and Half-Life 2 (Valve Corporation, 2004) on the right

The fun that came from interacting with the digital gaming medium formed a certain experience of novelty and from the first button-press we have been hooked. Instead of watching a film, where everything is determined by a director, we could affect what would happen any-time in the computer game that we were playing. Lately, we have gotten to grips with more modern computer games like the first-person role-playing game *The Elder Scrolls V: Skyrim* (Bethesda Softworks, 2011) in which you make elaborate choices on how your avatar should appear and how it should behave in the vast, open world of Skyrim. We have also tried our hands at the online multi-player game *World of Tanks* (Wargaming.net, 2010) which allows for teams of players to deploy various strategies in order to combat each other in renowned tanks from World War II.

Figure 5: A view of the world of Skyrim (Bethesda Softworks, 2011)

The fascination for games has steadily grown for us and ultimately guided us in our choice of studies. Now, we are enticed about the inner workings of games, but also the inner workings of human be-ings and their drive for playing computer games. It is no longer enough for us, both as students and soon-to-be game developers, to

only accept the fact that computer games are fun, and that certain techniques can be copied and employed in order to captivate players across the world. To us, there must be more than meets the eye when it comes to the many facets of computer games – which are solidified through our efforts to investigate both computer games as narratives, and as channels for adding value to the play experience by way of player-generated content.

2 The Problem Area

As the previous sections illustrated we want to learn more about the inner workings of the people who engage in the activity of playing computer games. Overall, it means that we want to know more about why we play – both from a game design perspective, but also from a more psychological perspective. We recognize that there is a world of game design and a certain methodology behind developing games that can allow for computer games to be successful in terms of both the gameplay mechanics and the audio-visuals that they incorporate. But, as we have mentioned previously there are still multiple questions that spring to mind – and these questions form the foundation for further work in the MA-thesis. In order for us to be able to venture further with the thesis we will have to concretise the area of interest. We will start by presenting our pre-understanding of what computer games are and what the value for playing them is. These pre-understandings are our accumulated knowledge from previous projects. Also we wish to present the methodology we use for developing our understanding in this thesis.

2.1 Initial Understanding

The following section contains theory that makes up our pre-understanding of the subjects of both computer games and theory of science. It is fields of theory which we are familiar with and find relevant in connection with describing the quality of computer games, play experiences, interactivity and the underlying methodology of investigating these fields of knowledge.

2.1.1 Methodology

Our approach to this MA-thesis is primarily inspired by a phenomenological and hermeneutic perspective, meaning that we utilize the knowledge and the interpretations we gather from investigating the area of interest. The field of hermeneutics is founded on the notion that activities are built upon dated actions and leave new trails every time something is done or something is changed (Collin & Køppe, 2003). In our case this will concern our theoretical understanding which will continuously provide a more specific way of looking at fun, player motivation and game design.

One of the most prominent speakers for hermeneutics was Hans-Georg Gadamer who stated that in order for an individual to understand another individual and its actions, the first individual had to take a starting point in its own life and world. That is why – according to Gadamer – it is only possible to understand other humans in terms of one's own world (Collin & Køppe, 2003). Since we want to work to achieve an understanding of fun and player motivation it all

depends on our prior knowledge of the field which in turn is affected by our education on the field of digital media, and also on our interest in the field of game design. This is closely related to the world of hermeneutics in which the human being is seen as a being situated in and involved in the world. Thus, human beings will always find themselves in situations where their understanding or acknowledgement will be the foundation of the actions they will need to perform. This understanding and all insight is derived from a certain pre-understanding (Collin & Køppe, 2003).

The understanding and interpretation of a situation can be characterized as a circular movement, since the understanding of the individual parts will lead to an understanding of the whole - which in turn will lead to a new understanding of the individual parts. This is what is known as the hermeneutic circle (Collin & Køppe, 2003). Throughout the thesis we will build upon our prior understanding of fun and player motivation in order to form a holistic view that covers the most relevant aspects of these issues in accordance with what can be seen as good game design praxis.

Before we investigate the various fields of our theory we want to take a step back and look at the interaction between an individual and the digital media. This is done in order to attain a better understanding of why people can find meaning in the interaction with a computer game. The lens that we will apply in order to understand this meaningful interaction is the teachings of Martin Heidegger on phenomenology.

2.1.2 Making Meaning

In order to argue for the importance that a player might place on a given computer game we will take a closer look at the aspects of phenomenology proposed by the phenomenologist theorist Martin Heidegger. He argued that it is impossible for the physical world to exist without the subjective world of the human mind and also the other way around:

> *"The interpreted and the interpreter do not exist independently: existence is interpretation, and interpretation is existence."* (Winograd & Flores, 1990, s. 31)

What Heidegger touches upon here is the subject of *being-in-the-world* (or in his own language, *Dasein*) which is the relationship between subject and object, and the phenomena of experience. Heidegger also uses the two terms, *readiness-at-hand* and *present-at-hand* to explain the experience of interaction between subject and object (Winograd & Flores, 1990, s. 36). We can illustrate the concepts with an example: Imagine you are playing a computer game in which you are role-playing a warrior that needs to save a kingdom

from a perilous dragon. As you are engaging in combat with the dragon you experience the flow of combat and have no problems with controlling the character's attack abilities. Then all of a sudden the dragon swoops down towards you, but unfortunately gets stuck in the geometry of the landscape drawn on the computer screen, and the geometry of the dragon starts to act out of the ordinary (or in a more common term, *a bug*[6]). At that instant the computer game will go from *readiness-at-hand* to *present-at-hand*. This means that you will be aware of the flaw in the computer game and thus unable to immerse yourself in the virtual world until the problem of the stuck dragon is resolved.

The concepts of phenomenology presented by Martin Heidegger can be related to other theories concerning experience and especially the activities of flow theory, which we will touch upon later in section 2.1.6

2.1.3 Being in the World

Another phenomenological theory we would like to implement as a base of our MA-thesis is how computer games can make use of familiarity to teach players how to interact with the game world. Paul Dourish has researched how this familiarity works. According to him, familiarity is based on embodiment which has two definitions; a simple definition and an elaborate definition. We will be looking at the simpler one to begin with:

- Embodiment means possessing and acting through physical manifestation in the world.
- Embodied phenomena are those that by their very nature occur in real time and real space (Dourish, 2001).

This means that all phenomena taking place directly in the world, such as conversations and other mutually engaged actions can be denoted as a form of participative status. The way embodiment works is by creating familiarity. If we look at computer games operating with 3D worlds, these games use our familiarity with the three dimensional structure of the real world. This is achieved by creating a convincing experience of the real world using perspective geometry. We are able to interact in the virtual world, because we are used to constantly acting in the physical world.

Dourish uses the above definition of embodiment to establish the term *embodiment interaction*. This is what is important for our theoretical understanding. According to Dourish the idea of embodiment is not new and has evolved over the past hundred years. He summa-

[6] A bug is an imperfection that can occur in a computer game as a result of faulty programming.

rizes the work of different phenomenology theorists by listing three common elements:

- Embodiment does not only mean physical manifestation. Embodiment is a foundational property from which meaning and action arise and the source of action and meaning is placed in the world. Embodiment is a way of being more than a physical property.
- Action in the world is fundamental to our understanding of the world and our relationship with it. We are not only embodied in the world, but also the world is the site and setting for all activity.
- Embodied practical action is the source of meaning. We find the world meaningful with respect to the ways in which we act within it (Dourish, 2001).

These three elements give us an understanding of how humans make meaning of the world and learn new things. The elements also tell us that we cannot avoid taking action. Even if we decide not to act, it still has consequences. If we look at computer games again, not taking action can have the consequence of losing the game. Most action games implement this consequence. In a race game you will lose the race if you decide not to drive the car. In a first person shooter you will be shot by your opponents if you decide not to move or shoot. The elements also tell us that taking practical action is the source of meaning.

We can draw parallels to other fields of theory when looking at embodiment interaction and the making of meaning. The examples provided in the paragraph above does not exactly say anything about the psychological aspect of deciding whether to act or not. They represent practical approaches to consequences in computer games and not why we as humans decide not to act in a computer game or what it can give us if we do – which is what we will look at in section 4.2

Now that we have presented our methodology for this MA-thesis, we will present our definition of computer games as well as interactivity, along with presenting the theory of flow and discussing the importance of the phenomenon of Web 2.0 in relation to this MA-thesis.

2.1.4 Definition of Computer Games

Before we can talk about computer games, we will need a definition. In order to establish such a definition of computer games, we find it important to investigate other definitions. We will then use these to create our own.

One of the game definitions we will take a look at is Jane McGonigal's. She lists four traits that define games – both digital and

real-world: a *goal*, *rules*, a *feedback system*, and *voluntary participation* (McGonigal, 2011). Her definition of a goal is the specific outcome towards which players will work hard to achieve. This adds a certain purpose to the game. The rules of a game set the boundaries within which a player can achieve the goal and pushes the player to think creatively and strategically. The feedback system helps the player know the progress made towards the goal. This can be shown in different ways such as points, levels or progress bars. Feedback helps motivate the player to continue by showing that the goal is achievable. Voluntary participation requires that anyone who plays the game does so by their own will and that they accept the goal, rules and feedback, so that all players meet on a common ground to play. Furthermore, the ability to enter or leave a game when the player wishes ensures that stressful or challenging tasks does not overwhelm players and the game is experienced as pleasurable and safe (McGonigal, 2011). McGonigal also mentions interactivity, graphics, narrative, competition, rewards, virtual environments, and the idea of winning, but she believes that they are not as defining for a game as the four traits listed above.

Another definition of a game comes from Katie Salen and Eric Zimmerman who has compared eight different definitions of games by other game scholars[7] to create the following definition of a game:

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

In this definition the system of the game is what contains all objects of the game and attributes of these objects, as well as the relation between them and the environment the game is set in. The players are people interacting with the system of the game and there can be one or several depending on the system. The artificial conflict means a contest of powers that can focus on either cooperation or competition and focus on solo conflict with a game system or multiplayer social conflict, which maintains a boundary to "real life" even though games happen in the real world. The rules define what players can and cannot do in a game system as well as providing the structure out of which play emerges. The quantifiable outcome is the result that lets players know how well they fared in the game at the end and is what usually distinguishes a game from less formal play (Salen & Zimmerman, 2004).

By comparing the traits from McGonigal with the definition from Salen & Zimmerman we can find similarities and differences. Both

[7] David Parlett, Clark C. Abt, Johan Huizinga, Roger Caillois, Bernard Suits, Chris Crawford, Greg Costikya, and Elliot Avedon & Brian Sutton-Smith (Salen & Zimmerman, 2004).

definitions mention and explain rules in much the same way. The *goal* is another aspect they both agree upon, where Salen & Zimmerman uses the term *quantifiable outcome*. The goal that McGonigal mentions also embodies the purpose of a game, where Salen & Zimmerman's purpose comes in the form of the artificial conflict that has to be overcome. Salen & Zimmerman do not mention a *feedback system*; they only explain the system of game objects. As such, Salen & Zimmerman do not operate with signs of progress up until the quantifiable outcome in the way that McGonigal does. McGonigal mentions *voluntary participation*, implying the players that Salen & Zimmerman takes into their definition, which takes the correlation between players and the game into account as well.

These comparisons of game definitions provide us with the elements we believe make up a good game definition - be it digital or non-digital: rules, a system, feedback, goal, willing players, and conflicts/obstacles.

Computer games have their own unique traits when compared to physical games. The main difference is the platform on which they are developed and published on. Whereas many other analogue games (such as card games, sports and board games) take place in the physical world, computer games take place in virtual worlds. Every setting we can dream up can be created as a virtual world on a computer. This creates the opportunity to be able to go from experiencing epic adventures in a jungle, uncovering ancient secrets, to carving down a mountain slope on a pair of skis surrounded by glaciers in a matter of minutes. This illustrates the immediacy of computer games. Salen & Zimmerman provide four traits of computer games which further emphasize the computer as a gaming platform:

- **Trait 1**: Immediate but narrow interactivity
- **Trait 2**: Manipulation of information
- **Trait 3**: Automated complex systems
- **Trait 4**: Networked communication (Salen & Zimmerman, 2004).

For further description of these traits, see appendix 9.2. Furthermore, not all of these traits have to be present at once in a computer game. For example several computer games can be played offline.

Using these traits for computer games along with the elements we found for games in general, we can comprise our working definition of computer games:

A computer game is a system – containing goals, rules and feedback, capable of manipulating information and automate complex se-

quences – with which players can voluntarily interact to overcome artificial conflicts resulting in a quantifiable outcome.

The purpose of our definition is to provide a structural framework for later analysis. We also wish to point out that rules govern the relation between game mechanics in a computer game.

Having presented the working definition of a computer game for this thesis, it is time to look at how we can define interactivity in games.

2.1.5 Interactivity in Games

As mentioned in section 2.1.2the only way of making meaning of the world is to interact with it. In order to make meaning of digital technology, humans need to interact with it. Therefore digital technology is interactive. This also counts for computers and thus computer games. In this section we will take a look at what exactly interactivity is and how it relates to computer games.

Looking at the meaning of the word *interactive* as explained by Oxford's English Dictionary:

1. *Reciprocally active; acting upon or influencing each other.*
2. *Pertaining to or being a computer or other electronic device that allows a two-way flow of information between it and a user, responding immediately to the latter's input.* (Oxford Enlgish Dictionary)

This definition tells us that the term interactive describes an active relationship between two objects. This is a very non-specific definition of interactivity and it can also be defined more specifically as:

"(...) a measure of a media's potential ability to let the user exert an influence on the content and/or the form of the mediated communication." (Jensen, 1998).

In section 2.1.4the definition of a computer game stated that games are systems, so it would be sensible to look at how interactivity works in a system.

An example of how this can be presented was created by Claus A. Foss Rosenstand, Associate Professor in Digital Media at the Department of Communication and Psychology at Aalborg University. The system he presents is called a *simulator* which consists of an interface, functions, and a model. When a user interacts with this simulator, it becomes a *usage situation*. A representation of this can be seen in Figure 6.

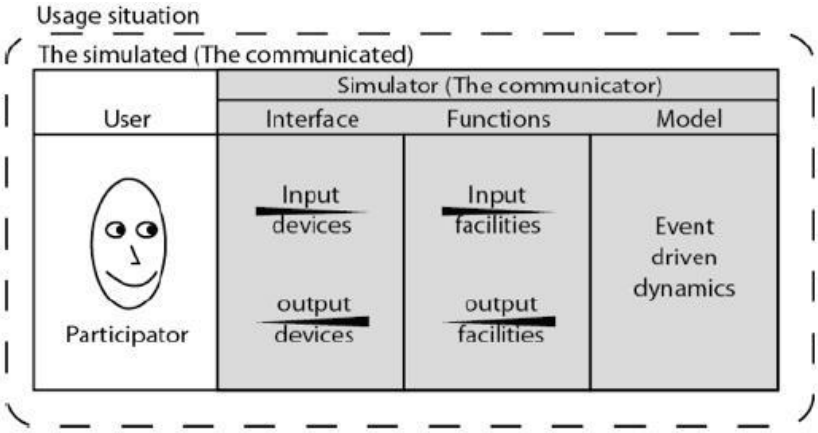

Figure 6: Claus Rosenstand's Usage Situation Model (Rosenstand, 2011)

In the usage situation all elements have a reciprocal relationship with each other. If we look at a computer game as an example for the usage situation, we can explain it as follows: the user presses buttons on keyboard and mouse (user → interface) which turns into binary code (interface → functions) which is given to the game engine (functions → model). The game engine then produces the right response and returns it (model → functions) so it can be converted from binary code to signals (functions → interface) which the screen and loudspeakers/headphones can present to the user (interface → user). At each step, information is flowing two ways and is always immediate. Rosenstand explains the dotted line around the model as a representation of the non-distinct boundaries of a usage situation, which the simulator (or system) cannot control.

Now that we have defined interactivity and explained how it works in a game system it is time to define meaningful interactivity in relation to games. Brenda Laurel, a digital media theorist, explains in an article on the subject of computers as theatre that:

> *"(...) you either feel yourself to be participating in the ongoing action of the representation or you don't"* (Laurel, 1993).

Here the representation is the computer game. This feeling of participation is rudimentary for a good computer game. If you feel distanced from the action in a computer game, it will not be a very involving and engaging experience. Laurel also lists three variables to help determine how interactive a computer game can be:

- **Frequency** is how often you get to interact.
- **Range** is how many choices you have.
- **Significance** is how much impact the choice has on the game.

These three variables can help create the feeling of participation, but are not as important as the feeling, according to Laurel, as they can come from elsewhere as well, such as sensory immersion.

Another attribute she brings to the table regarding the experience of interactivity in computer games is that it is very context-dependent. If the feedback from certain actions does not make sense in the context of the game, the feeling of participation suffers. For example if a button that has been assigned to one function throughout the game changes function suddenly, the feeling of participation suffers, as the player has to spend time to figure out the sudden new function of the button (Laurel, 1993). This can also be seen as break in flow and relates to the theory in section 2.1.6

To conclude this section, we will present the most important aspects of interactivity in computer games. Interactivity can be considered well implemented in a computer game when it:

- Is immediate;
- Has a high frequency;
- Has a broad range;
- Has significance correlating to the importance of the interaction in the context of the game; and
- Fits within the context of the game.

These aspects are a part of our pre-understanding of how computer games can be seen as engaging. Interactivity helps make meaning of the computer as a platform for games.

With the definition of computer games and aspects of interactivity out of the way, it is time to look at the theory of flow and why it is important to the thesis.

2.1.6 Flow Theory

One of the most fundamental theories to game design, in our opinion, is the theory of *flow*. It was created by the psychology professor Mihaly Csikszentmihalyi when he attempted to explain happiness (Debold, 2002), and presented in his work *Flow: The Psychology of Optimal Experience*. Flow as a theory covers the phenomenon of people losing themselves in a task for stretches of time, where time, hunger or physical fatigue will go unnoticed by the person, because of a mental state of flow.

Csikszentmihalyi identified eight main components of flow of which not all are required to achieve a state of flow:

- A challenging activity requiring skill;

- A merging of action and awareness;
- Clear goals;
- Direct, immediate feedback;
- Concentration on the task at hand;
- A sense of control;
- A loss of self-consciousness;
- An altered sense of time (Csikszentmihalyi, 1990).

In Figure 7 below is a graphical representation of how the state of flow develops throughout a task.

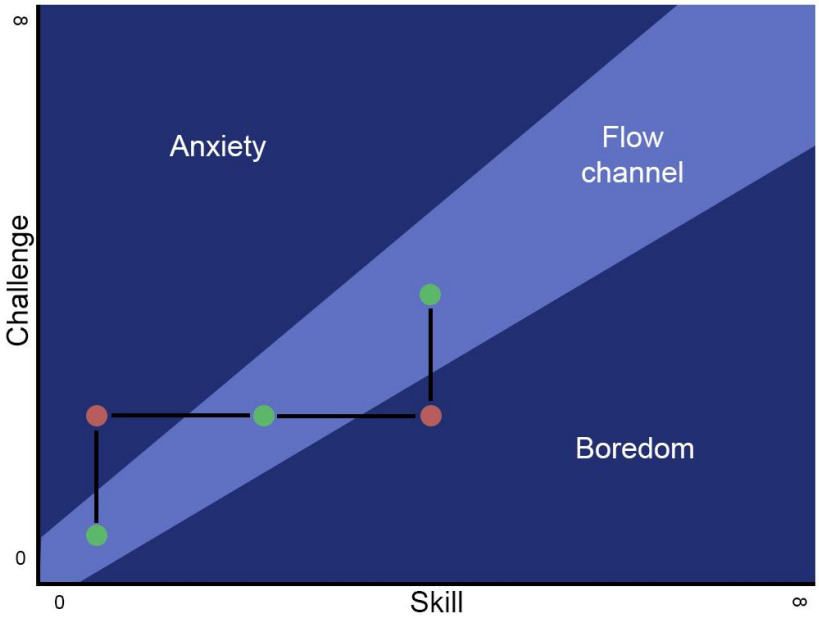

Figure 7: A visual representation of a person's skill development in dealing with a challenge with increasing difficulty

In the development of flow in a task, all tasks involve a certain amount of challenge to overcome. Each person has an amount of skill he/she can use to overcome the challenge of the task. In the above example, the person's skill level is adequate to the challenge of the task at hand, resulting in a state of flow. The challenge of the task, however, increases and the person's skill level is no longer adequate to handle the challenge of the task, causing the person to leave the state of flow and enter a state of anxiety. The person then learns new skills to cope with the increased challenge, and re-enters a state of flow again. After some time, the challenge does not increase but the person's skills keeps developing, so the challenge is no longer adequate, and therefore the person enters a state of boredom, until the challenge of the task increases again. This cycle can continue indefinitely, in theory.

As mentioned in section 2.1.2, phenomenology has connections to the theory of flow. In the example of the dragon bugging out, the player is in a state of flow, where the challenge of fighting the dragon

meets the skill set of the player. The player is immersed (loss of self-consciousness) in the game, his actions and awareness are merged, and he is concentrating on the task of killing the dragon. When the dragon suddenly bugs, the action and awareness breaks connection and his concentration is pulled away from the task of killing the dragon, as the player focuses on the bugged state of the dragon. This also breaks the immersion and the player exits the state of flow. The phenomenology term readiness-at-hand can be seen as comparable to flow and the term present-at-hand can be seen as a break of flow.

When talking about computer games and flow, one person is in particular interesting. Jenova Chen, a game developer, made a thesis called *Flow in Games* describing how the theory of flow is best used in computer games. He identified three core elements, based on Csikszentmihalyi's eight components, a computer game need to have to allow the player to achieve a state of flow:

1. As a premise, the game is intrinsically rewarding, and the player is up to play the game.
2. The game offers right amount of challenges to match with the player's ability, which allows him/her to delve deeply into the game.
3. The player needs to feel a sense of personal control over the game activity (Chen, 2006).

In order for a game to allow a player to stay in a state of flow, some sort of adjustment of the difficulty of the challenges has to be created as well. Recalling the visual representation of the state of flow in Figure 7, if a game has only one difficulty throughout the game, it would either be too hard to get started with the game and the player would be thrown into a state of anxiety from the get go or the game would become boring after a while as the player's skill increases while the difficulty of the game remains the same. An adjustment of the difficulty is not enough in its own, to keep players in a state of flow. Some players have greater skills because of more experience with computer games while others are novices, creating different flow channels for each individual. A visual representation of this can be seen in Figure 8 below.

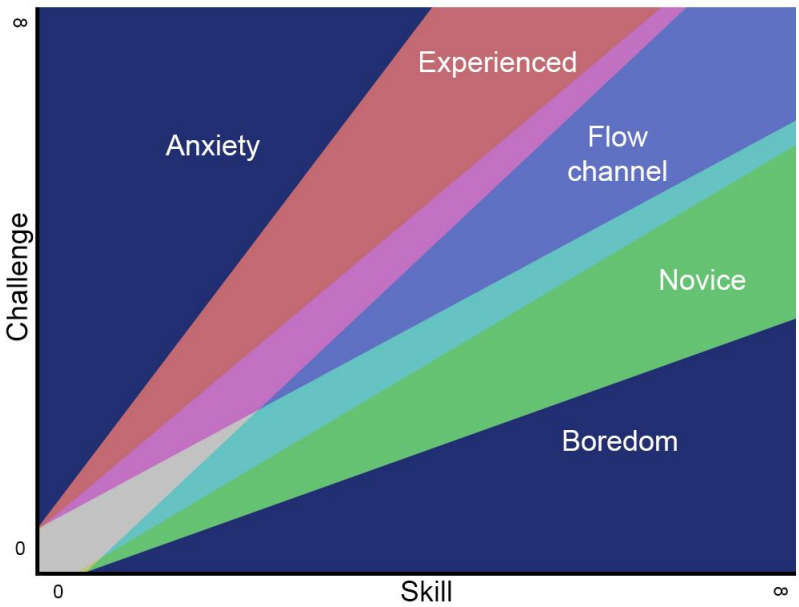

Figure 8: Different flow channels for different players.

To accommodate all the different skill levels, the difficulty has to be adjusted dynamically. This can be done by analysing in-game data, thus in a way reading the skill level of a player, and then adjusting the game difficulty according to that (Hunicke & Chapman, 2004). In his thesis, Chen discusses how the difficulty of computer games should be dynamically adjusted based on subconscious choices by the player rather than adjusted by analysing in-game data about the skills of a player. Chen analyses different dynamic difficulty adjustment designs based on this analysis of in-game data and concludes that none of them allows for the third core element of achieving flow in games he identified; letting the player feel a sense of control over the game activity. He believes that by allowing the player to subconsciously adjust the difficulty of a game, the player can get a feeling of control over the gaming experience, whereas adjustments made based on collected data merely takes the player along for the ride (Chen, 2006).

To prove his thesis, Chen created the game flOw[8], an aquatic existence experience, where the players have to eat plankton in order grow and where they can change the difficulty of the game themselves by diving deeper into the depths of the sea. Here they can meet larger creatures and try to eat them before being eaten themselves. The game incorporated the elements Chen listed and was a success; it won a Game Developers Choice Award for Best Downloadable Game in 2008, was downloaded more than 100.000 times in the first week, and was played more than 3.5 million times since its release in 2006 up until the award (Sunilkumar, 2008).

[8] http://interactive.usc.edu/projects/cloud/flowing/

The theory of flow is important for this thesis because it is part of our pre-understanding of why we as people like to take action in our lives and why we find computer games engaging and fun.

Now that we have presented our pre-understanding of how playing computer games is a meaningful activity, it is time to move onto a phenomenon, called Web 2.0, which gave way to the wave of online social media. This is relevant because it is a part of our understanding of how people use media to express themselves and have control of how their experience is on the Internet.

2.1.7 Web 2.0

In this section we will describe the internet phenomenon widely known as Web 2.0 as well as Groundswell, a phenomenon that emerged through Web 2.0. These phenomena are important to touch upon in the context of this MA-thesis as we believe they influence how players view computer games as a media and the participation in them.

Before blogs, wikis, MySpace, Facebook, YouTube etc. the internet consisted mostly of databases governed by administrators, which people could access and browse through but not influence in any way. The term Web 2.0 was first used by Darcy DiNucci in 1999 in her article *Fragmented Future*:

> *"The first glimmerings of Web 2.0 are beginning to appear, and we are just starting to see how that embryo might develop. The Web will be understood not as screenfuls of text and graphics but as a transport mechanism, the ether through which interactivity happens."* - (DiNucci, 1999)

This tendency is evident now with all the aforementioned internet services along with many others. People can now interact with each other and web services like never before. Web 2.0 also allows for a great deal of user influence. It is possible for people to customize their online experience to their own taste. Examples of this can be found in YouTube, where users can decide which channels to subscribe to in order to be presented with videos to their liking, and in Facebook, where users can choose which Facebook friends they wish to receive updates from. Furthermore, people can choose how they wish to present themselves on these social media, having the possibility to hide and show a variety of information to others.

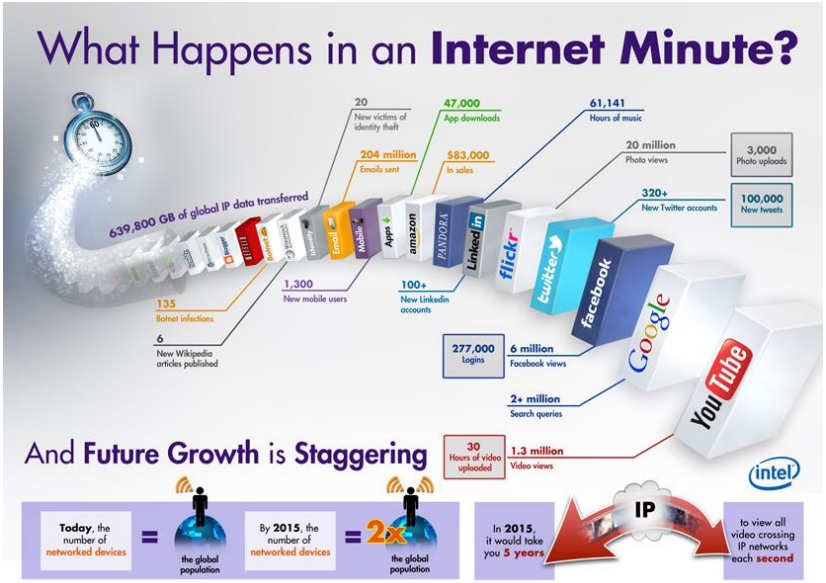

Figure 9: Illustration of the interaction on the internet (Intel Corporation)

As Figure 9 illustrates there is a large amount of interaction taking place on social media on the internet. Coupled with our previous description of Web 2.0 this denotes what can be categorized as user-generated content.

The connection between people online also created a new movement. This movement is described by Charlene Li and Josh Bernoff in their book "Groundswell: Winning in a World Transformed by Social Technologies". In their book they attempt to define the fundamental change in behaviour online using the term *groundswell*. Their definition of the groundswell is as follows:

> *"A social trend in which people use technologies to get things they need from each other, rather than from traditional institutions like corporations."* - (Li & Bernoff, 2011)

Many of the examples of groundswell that they provide in their book include blogs writing about sensitive information (e.g. commercial information from private companies which might make these companies look bad) to which the response from the companies is threats of lawsuit. Groundswell happens when the readers of that blog post links back to the information on their own blogs, exposing the intentions of the company which can turn into negative PR. In essence, the consumers are in control of the brands of the companies and the companies need to listen to the consumers to get an advantage (Li & Bernoff, 2011, pp. 14-15).

Li & Bernoff argue that groundswell is created from the collision of three forces:

- **People** and their ability to draw strength from each other and depend on each other is a very important aspect of groundswell. Throughout history people have stood together against institutional power (e.g. in social movements like labour unions);

- **Technology** is the aspect that has made social interaction between people across the world possible. Li & Bernoff claims that almost everyone is online (in 2010 the percentage of Americans online reached 79% and the percentage of Europeans online reached 69%). The connection between people is growing ever faster and more ubiquitous in correlation to the amount of people with broadband and a cell phone capable of connecting to the internet;

- **Economics**, which on the internet translates roughly to traffic. The more people that are online, the greater the potential of clicks on advertisement banners is, thus the greater the value is for companies. More mobile applications also feature advertisements (Li & Bernoff, 2011).

Out of the three trends listed above, the one that seems to be the most enabling for groundswell is technology. It seems that understanding the technology of groundswell would be a solid fundament on its own. According to Li & Bernoff, however, the technology changes so fast that it is more important to understand the driving forces of the technology – the relationships between people. The ability to connect and cooperate that people are capable of is the foundation of groundswell. Regardless of the type of technology, people are good at connecting and cooperating, which is why listening to consumers is the key to most companies' success (Li & Bernoff, 2011).

Both Web 2.0 and Groundswell showcase great amounts of user influence and it is our belief that these phenomena influence the way people view other media. We believe that people getting used to the amount of influence that Web 2.0 and Groundswell accommodates will come to expect this amount of influence in other media they encounter. This behaviour is also what we would describe as autonomous – exactly in the sense that users exercise more influence and are less controlled in their behaviour online. It can be argued that most games allow for user influence in the form of interactivity; players can control the game in some way or the other and thus influence the outcome of various scenarios. But the amount of influence players have is limited when comparing to the possibilities of online services regarded as part of Web 2.0. The gaming industry has already tried to accommodate this trend with examples such as Little Big Planet (Media Molecule, 2008) and ModNation Racers (United

Front Games, 2010), where players can create their own game worlds and share them with other players through in-game platforms.

2.1.8 Summary

This concludes the introduction to the problem area and the understanding we have of fun and possible human motivation for engaging in both the activity of playing and the activity of producing online content. Earlier in this section we presented the field of phemenology and we used this field of theory to describe our understanding of human action. As such, we believe that we as humans have a need to act and through action we make meaning of the world. This is our understanding of human motivation. We primarily understand fun in the terms of achieving a state of flow, and we understand that computer games can be categorized as highly interactive media. The theories of flow and interactivity form our understanding of player motivation as the theories describe the elements needed in order to engage people to interact with digital media. Furthermore, we compared the definitions of computer games in order to describe the formal structure from which computer games are created. Finally we touched upon Web 2.0 and the ability of it to describe that people show autonomous behaviour through user-generated content. This applies for computer games as well, a factor we worked on in our previous projects (Haferbier & Lund-Pedersen, 2012). It is now possible to go a step further and introduce the problem statement and the fundament for further investigation in this thesis.

3 Problem Statement

The goal of the MA-thesis is to understand why we play games. In the backdrop of our pre-understanding we will shape the framework of analysis. Setting up a proper theoretical framework requires us to investigate theories concerning player and human motivation.

The aim of the MA-thesis is to answer the following problem statement:

- *How can knowledge on the term "fun" in computer games help us to understand player motivation, and how does it relate to human motivation?*

As such, the purpose of the MA-thesis will be to investigate two different aspects of computer games: on one side the game design elements that make a computer game fun and on the other side the psychological aspects of human motivation.

The MA-thesis will not only be based on theories concerning game design and human psychology, but also the working hypotheses that form our pre-understanding of the subject of computer games:

- *The value of player choice in computer games is important to the play experience*

Now that the problem area has been concretised through the problem statement we will delve into the fields of theory needed to answer the problem statement.

4 Human Motivation

The purpose of this section is to investigate the field of human motivation, as we want to understand if and how it relates to player motivation and fun in computer games. Part of the problem of the thesis is to provide an understanding of the aspects of human motivation as these might form a foundation for working with what players find interesting when engaging in the act of playing digital games.

We want to emphasize that our goal with the MA-thesis is not to uncover, to a large extend, the psychological fields relevant to human motivation. The field of psychology is vast – and to unearth and describe every facet of it is beyond the scope of this thesis. We will focus on one theory covering human motivation and use it to create a better understanding of player motivation and how it relates to having fun in computer games.

Wanting to understand the fun that comes out of the interaction between humans and computer games opens up many avenues of investigation. We have looked at various theories which give meaning to the value that the action of playing a computer game can contain. Using Csikszentmihályi theory of flow (section 2.1.6) it is possible to describe the value of an experience during a certain activity. As we have already described, being in flow is to be completely motivated and engaged in an activity (i.e. playing a game of chess). This feeling of being totally immersed is in itself valuable and people seek it time and again, because being in flow means that we have clear goals, get clear feedback on our actions, and that our skills are tested in such a way that we are never too bored or too frustrated. Flow theory is one way to give meaning to the term *fun* and the experience of playing computer games, but it is only part of a larger field known as positive psychology. Even though flow theory can be used to identify the value of playing computer games, we want to uncover more aspects of the pure human motivation for engaging in the activity of play, and the components that are needed to make playing computer games a fun and motivating experience. To make sense of human motivation we find it important to look into another theory from the field of positive psychology, and we will do so accordingly.

4.1 The Psychological Approach

Human motivation is in itself a large and complex concept, and it contains many different elements that can explain how and why we act in our everyday lives. We will ease ourselves into the field by looking at the writings of Daniel H. Pink – an American journalist and author who addresses the issue of motivation, strongly influenced by the research performed by Edward L. Deci and Richard M. Ryan. Deci and Ryan both works extensively with the theory called,

Self-Determination Theory (SDT), a theory we will look at later in this section.

In his book, *Motivation: The Surprising Truth about What Motivates Us*, Pink brings up three different drives of behaviour, based on experiments performed by Harry F. Harlow[9]: the first drive is the biological one (i.e. the needs for eating, sleeping, etc.); the second drive is the one that affects from the outside (i.e. in the form of punishments and rewards); and the third drive – which was discovered as part of the experiments – is intrinsic motivation (i.e. enjoying the performance of the task) (Harlow, Harlow, & Meyer, 1950).

Daniel Pink refers to the industrialization as the, *era of motivation 2.0*, in which the primary methods of motivation were to use either punishment or reward in order to achieve the proper behaviour – with the belief that there would not be any side effects (Pink, 2010, p. 19). The mind-set behind motivation 2.0 was that if you wanted people to perform better in a certain task you would only have to promise a significant extrinsic reward to them. According to Pink this is a misconception: in several studies, the use of extrinsic rewards or punishments has proved to be effective for short-term, extrinsic motivation, but downright devastating to the intrinsic motivation, which might result in a loss in performance or loss in interest for the given activity (Pink, 2010, p. 8).

As mentioned earlier, the writings of Daniel Pink are strongly influenced by the studies of Edward Deci and Richard Ryan. In 1969, Edward Deci performed studies of a similar nature to the ones that Harry Harlow underwent with rhesus monkeys. Deci designed an experiment in which he compared groups of students who were tasked with solving a *Soma* puzzle (see Figure 10) in order to investigate how the third drive, intrinsic motivation, played a role in the activities of human beings (Deci E. L., 1972). Surprisingly, the result of the experiment was that the group of students, who had been paid for solving the Soma puzzle, and then later stopped receiving extrinsic rewards for the puzzle-solving, lost interest in the puzzle and performed worse than their counterpart (Pink, 2010, p. 8).

[9] Harry F. Harlow was a professor of psychology at University of Wisconsin. His experiments involved having rhesus monkeys solve a simple puzzle.

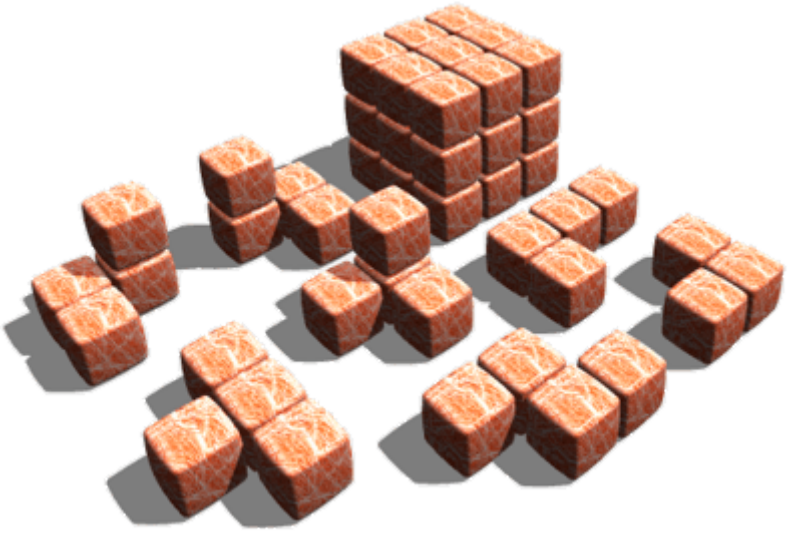

Figure 10: Soma puzzle

Daniel Pink gives us an overview of the ideas behind the research into human motivation, but in order to better understand the impact of both intrinsic and extrinsic motivation on the activities of humans we will provide an overview of the source itself: Self-Determination Theory.

4.2 Self-Determination Theory

In order to give a proper introduction to the field of self-determination theory we will provide the reader with a concise overview of the historical development of motivational theories.

During the 1960's a shift towards cognitive theories occurred and the concept of psychological needs was repudiated – its replacement consisted of the concept of goals as the dominant motivational concept. Thus, the concept of psychological value of outcomes was defined functionally (i.e. not related to need satisfaction) – much as the concept of reinforcement has been defined functionally in operant psychology by B. F. Skinner which will be elaborated upon in section 4.3 According to Deci et al., the problem of this development was the shift in focus from the content of goal selection and pursuing to the process of selecting and pursuing goals instead (Deci & Ryan, 2000).

Several theories have treated motivation as a unitary concept, either by not specifying types of motivation or by specifying types but then adding them together to form a total motivational framework (e.g. Bandura, 1996; Hull, 1943). Such theories, and also theories like B. F. Skinner's theory on operant conditioning, have been able to effectively predict amount of behaviour, but they have been less effective in predicting qualities of behaviours. SDT maintains that knowing whether people's motivation is more *autonomous* or more *controlled* is important for making predictions about the quality of people's en-

gagement, performance, and well-being than is the overall amount or intensity of motivation (Deci & Ryan, 2012).

Supporters of self-determination theory maintain that in order to fully understand goal-directed behaviour, psychological development and well-being, there is an incentive for addressing needs that:

- give goals their psychological potency,
- influence which regulatory processes that direct human goal pursuit (Deci & Ryan, 2000, p. 228)

4.2.1 Concept of Needs

Before delving into the specific needs that make up the foundation for self-determination theory, it is relevant to look at the historical perspective of the concept of needs.

4.2.1.1 The Early Needs Theories

In terms of the empirical psychology of motivation there exist two different traditions which utilized the concept of needs. In the field of experimental psychology, Hull (1943) proposed a move towards understanding molar behaviour by relating it to the organism's primary needs and the conditions in the environment relevant to them. Hull identified a set of innate physiological needs (e.g. for water, food, sex) which gave rise to drive states, pushed an organism into action and must be satisfied for the organism to stay healthy. By linking drive stimulation to the responses that lead to drive reduction, learning was produced (Hull, 1943). The idea of drive state reduction was used to predict subsequent behaviour in an organism, and the whole tradition produced a vast array of findings. The shortcomings of these drive theory assumptions were that it was difficult to provide a meaningful account of spontaneous activities (e.g. vigorous play and curious exploration, which also can be observed with people playing computer games) and they had no immediate ties to the dynamics of drive reduction (Deci & Ryan, 2000, p. 228). As mentioned earlier in this section, Harlow (1950) performed experiments that resulted in recognition of intrinsic motivation, and these experiments, alongside other drive theorists' attempts to account for behaviour behind spontaneous activities further supported the recognition of intrinsic motivation (White, 1959) and this eventually led to the identification and specification of the psychological needs.

The work of Murray (1938) represents the second tradition focusing on psychological needs. Rather than addressing needs at the physiological level, Murray viewed needs as of psychological nature and primarily as obtained rather than innate. Murray proposed a definition of the term *need*:

"A need is a construct (a convenient fiction or hypothetical concept) that stands for a force (the physico-chemical nature of which is unknown) in the brain region, a force that organizes perception, apperception, intellection, conation and action in such a way as to transform in a certain direction an existing, unsatisfying situation."
(Murray, 1938, pp. 123-124)

According to Deci et al. the definition is broad and as such it can be said that anything that spurs a human into action is a need, and this is further emphasized by Murray's adoption of psychological needs such as greed and dominance within his list of needs. The shortcoming of this way of focusing on psychological needs is that it represents an array of motives whose pursuit may or may not lead to optimal psychological functioning (Deci & Ryan, 2000).

4.2.1.2 Definition of Needs in SDT

Self-determination theory is based on both of the traditions previously mentioned. As in the tradition of Hull, SDT defines needs as innate, organismic necessities rather than obtained needs, and as in the tradition of Murray, SDT defines needs on the psychological level rather than the physiological level. Thus, a definition of needs according to SDT can be written in the following way:

"(...) needs specify ***innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being.****"*
(Deci & Ryan, 2000, p. 229)

As previously stated, three needs have been identified: the need for *competence*, *relatedness* and *autonomy*. The definition assumes a fundamental human movement toward optimal functioning and psychological health. In other words, needs are defined as universal necessities, and as such they represent the nutriments that are required for optimal development, psychological health and proactivity for all humans. As mentioned, the needs are not learned but are instead an inherent part of human nature, and operate across gender, culture and time (Deci & Vansteenkiste, 2004).

The three needs: competence, relatedness and autonomy, were derived empirically. Various phenomena caused the comprising of these human needs to be universal in order to provide meaningful interpretation. The needs are based on research on various phenomena such as: the undermining of intrinsic motivation by tangible rewards (Deci, Koestner, & Ryan, 1999), contextual factors promoting the internalization of extrinsic motivation (Ryan & Connell, 1989), and goal contents and lifestyles affecting well-being (Vasteenkiste, Ryan, & Deci, 2008).

In order to understand and use the concept of needs, we will need to broaden our understanding by looking at various descriptions of each

need. First, a short summary of them will be provided and afterwards a more in-depth description will follow:

- **Competence:** The human being's innate desire to grow abilities and to gain mastery of new situations and challenges. This extends to the experience of beating a challenge or developing abilities in a meaningful way.
- **Autonomy:** Reflect the innate desire to take actions out of personal volition.
- **Relatedness:** The need to have meaningful connections to others. (Rigby & Ryan, 2011)

The need for competence addresses the assumption that, throughout life, people seek to engage their world in an attempt to master it and by doing so achieve a sense of competency. The need concerns people's innate desire to be effective when dealing with the environment around them (White, 1959). The need for autonomy concerns people's urge to be a driving force behind action, to experience volition (i.e. personal willingness), and to act in accordance with their own values and interests. Being autonomous does not automatically entail the independence of others, but rather it means to be able to feel a sense of choice and willingness when taking action (which also is a part of our computer game definition in section 2.1.4), whether these actions are initiated independently or in response to a request from people in close relationships (Chirkov, Ryan, Kim, & Kaplan, 2003). Finally, a good deal of the daily activities in life involves other people and is as such directed at experiencing the feel of belonging (either to someone or to somewhere). Thus, the need for relatedness concerns the drive towards interacting with and connecting to other people (Baumeister & Leary, 1995).

4.2.2 SDT and Intrinsic Motivation

Satisfaction of the described psychological needs helps facilitate people's autonomous motivation (i.e. acting with a sense of full volition and endorsement), whereas hindering these needs promotes *controlled* motivation (i.e. feeling pressured to behave in certain ways) or being demotivated (Deci & Ryan, 2012).

In healthy individual development, people move in the direction of greater autonomy. This entails internalising and integrating external regulations over behaviour, and learning to effectively manage drives and emotions. Additionally, it means maintaining intrinsic motivation and interest, which are vital to assimilating new ideas and experiences. When people are more autonomous, they exhibit greater engagement, vitality, and creativity in their life activities and relationships (Deci & Ryan, 2012).

The concept of autonomy is, at different times, used to refer to a motivational state, to an enduring motivational orientation, and to a fundamental psychological need, depending on what problem is being addressed. A central function served by the concept of autonomy within SDT is to differentiate types of motivation with their corresponding qualities of functioning. We will further investigate the idea of differentiation of extrinsic motivation.

4.2.3 Differentiation of Extrinsic Motivation

The classic example of being extrinsically motivated is by acting in the pursuit of rewards or avoidance of punishments. This is referred to by *external regulation*, which is the type of regulation emphasised in operant psychology as described in section 4.3There are two subtypes of controlled extrinsic motivation: external regulation and introjected regulation. The first can be exemplified as operant conditioning by way of punishment or reward. The second can be exemplified by way of parents rewarding their children according to how well they perform in school. The individual child can therefore be controlled by how it perceives itself according to the performance in school (i.e. if the child receives low grades, the self-esteem can decline) which can result in negative well-being consequences (Deci & Ryan, 2012, p. 89). Furthermore, because these values are only partially internalized, people will typically not feel fully volitional when enacting them so the behaviours are motivationally unstable and not strongly connected to long-term commitment (Deci & Ryan, 2000).

When individuals understand and accept the real importance of an activity, the regulation of extrinsically motivated behaviours is more autonomous. This type of regulation is called *identified regulation* because of the individuals identifying themselves with the value of the behaviour. Finally, when identification matches other identifications, needs, and experiences, the resulting regulation is referred to as *integrated regulation*, which represents the most highly autonomous form of extrinsic motivation (Deci & Ryan, 2000).

We now have several subtypes of autonomous motivation: *external*, *introjected*, *identified* and *integrated* forms of extrinsic motivation, alongside with intrinsic motivation. Figure 11 illustrates the levels of autonomous and controlled motivation:

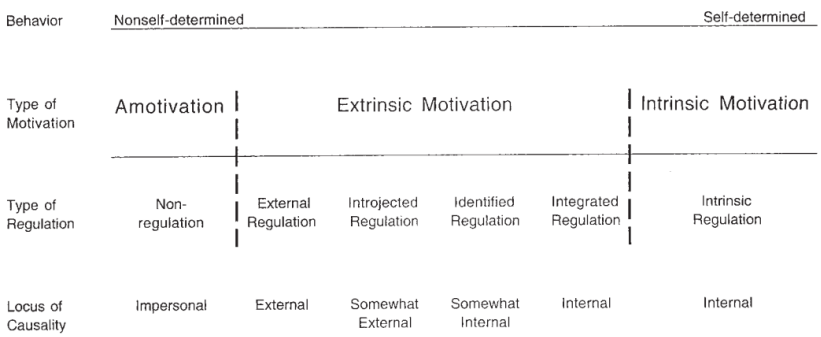

Figure 11: A taxonomy of human motivation (Deci & Ryan, 2000, p. 237).

It is important to note, that while intrinsic motivation and integrated extrinsic motivation share various characteristics, such as flexibility and volitional engagement, they differ in that intrinsic motivation refer to doing behaviour because it is interesting and enjoyable in its own right. But, integrated regulation refers to doing the behaviour because it is personally, though instrumentally, important, valued and meaningful to the person. A good example of this is when one studies hard to achieve competencies needed for a later career. Even though the studying is done with personal volition it is still a form of extrinsic motivation since the activity of studying is not done out of sheer enjoyment (Deci & Ryan, 2012, p. 89).

Different types of regulation can co-exist, and within SDT there is often a focus on the *relative autonomy* of a person's actions, using procedures that aggregate these multiple motives (Ryan & Connell, 1989).

4.2.4 Manipulation of Goal Orientations

As the theory above shows there is a correlation between the *what* and *why* of pursuing both intrinsic and extrinsic life goals. As we have already described there are different levels of extrinsic motivation, and we can primarily talk about motivation as either *autonomous* (i.e. intrinsic motivation) or *controlled* (i.e. extrinsic motivation). The examples provided suggest that people oriented towards extrinsic goals is also more controlled in their behaviour, whereas people oriented towards intrinsic goals is more autonomous in their behaviour. Having either controlled motives or autonomous motives thus ultimately determines whether a person will be pursuing goals of extrinsic or intrinsic value (Deci & Ryan, 2012, p. 92).

Ryan et al. describe experiments in which two groups of business students were presented with study material, along with two different goal orientations. One of the groups were told that the study material would improve their understanding of themselves (i.e. personal growth), and the other group were told that the material would help them earn more money in their career (i.e. extrinsic goal of wealth). The results of this experiment indicated that the group of students

that studied under influence of intrinsic orientation learned the material better than their counterpart who had the extrinsic orientation. Furthermore, the later presentation given by the students on their study material were rated higher for the intrinsic oriented group than for the extrinsic oriented group (Deci & Ryan, 2012, p. 93).

4.2.5 Summary on SDT

In the previous section we have presented and described the theory of SDT. The theory forms a foundation for discussing computer games in terms human motivation. We find SDT relevant because the theory includes basic psychological needs, and that these needs can describe the reason for engaging in the activity of play. On that note, we can argue that the concept of autonomy can relate to computer games in more than one sense: autonomy as a factor for performing play and autonomy as the fundament for voluntary participation. As mentioned in section 2.1.4 the game definition suggests that every good game should contain voluntary participation and if autonomy signifies the act of personal volition, then computer games are inherently autonomous.

Having looked at human motivation we can draw connections between the theory of flow and SDT. If we recall the different components and elements of flow, they have some similarities to our findings in the section above. For example Chen's third element and Csikszentmihalyi's sixth component, the need to feel in control, correlates very well to autonomy. Additionally, the first of Chen's elements directly states that games as a premise are intrinsically rewarding, which also is important for human motivation in according to the theory of SDT. Furthermore, we have found that humans have an inner driving force, motivating them to act in the world, but that external stimuli affects some aspects of our motivation as well.

4.3 The Virtual Skinner box

Having explained intrinsic and extrinsic motivation in relation to SDT, it is relevant to look at extrinsic motivation in relation to operant conditioning, which can be categorized as external regulation, and how its concepts are implemented in computer games.

We will start by presenting the "Skinner Box" - or the operant conditioning chamber. It was developed by the American psychologist Burrhus Frederic Skinner at Harvard University in order to study both classical conditioning and operant conditioning (Skinner, 1953). Classical conditioning is what the Russian psychologist Ivan Petrovitj Pavlov researched with his famous experiment, where he, by ringing a bell each time he fed dogs, eventually could make the dogs drool just by sounding the bell. In effect, he taught the dogs to react

to the sound of the bell as they would to just food alone by pairing the two stimulus long enough (Todes, 2002).

Operant conditioning is interesting in terms of game design. It makes use of *reinforcement* and *punishment* to modify behaviour. The American psychology professor, Raymond G. Miltenberger, describes these methods in his book *Behaviour Modification: Principles & Procedures*. Reinforcement is used to increase behaviour while punishment is used to decrease behaviour. There are different ways to reinforce and punish behaviour. Reinforcement has two sides: *positive* and *negative*. In positive reinforcement an appetitive stimulus is added following desired behaviour. Negative reinforcement has two sides: *escape* and *active avoidance*. Escape is when a noxious stimulus is removed following desired behaviour and active avoidance is when the behaviour avoids noxious stimuli. Punishment also has a positive and a negative side. In positive punishment a noxious stimuli is added following behaviour and in negative punishment an appetitive stimuli is removed following behaviour (Miltenberger, 2008). Furthermore, schedules can be introduced to positive reinforcement. This means that the appetitive stimulus is delivered according to a schedule. There exist four simple schedules:

- **Fixed intervals** are schedules that deliver reinforcements after n^{th} amount of time.
- **Variable intervals** are schedules that deliver reinforcements after an average n^{th} amount of time.
- **Fixed ratios** are schedules that deliver reinforcements after every n^{th} response.
- **Variable ratios** are schedules where the number of responses necessary for reinforcement varies from trial to trial (Miltenberger, 2008).

Skinner researched operant conditioning on subjects, such as rodents and pigeons, placed in the box. To accommodate operant conditioning experiments with rats, the box is fitted with a lever and a food dispenser. One aspect of the experiments was to use variable ratio schedules to modify behaviour. In these experiments a food pellet would be dispensed upon a random amount of presses on the lever. The rat then learned that the more it was pressing the lever, the more food would be rewarded. The way this experiment differs from Pavlov's experiment is that the food is awarded randomly. This random dispense of food keeps the rat pressing the lever for more food (Skinner, 1953). For a visual representation, see Figure 12. An example of this can also be found with slot machines, where coins are paid out at random intervals of pulling the lever. Some individuals feel compelled to keep pulling the lever for the reward even though

they might have lost several times in a row, because the next pull of the lever might be the winning pull (Loftus & Loftus, 1983).

Another aspect to the Skinner box is the ability of some versions of the box to accommodate for escape in the negative reinforcement category. This is done by delivering an electrical shock through the floor if a certain amount of time elapses between presses of the lever. This teaches the rat to keep pressing the lever even though it does not desire food anymore (Skinner, 1953).

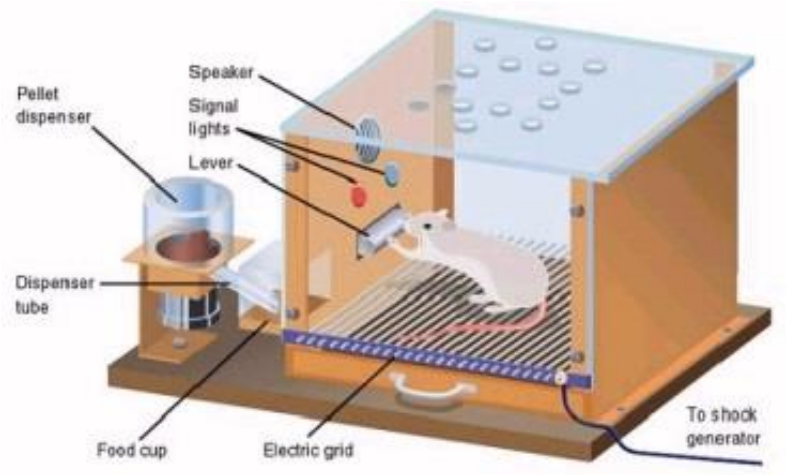

Figure 12: The Skinner Box (8BitScholar, 2013)

4.3.1 Summary

The theory on operant conditioning is relevant to the clarification of human motivation in the sense that it elaborates on external regulation which is part of extrinsic motivation. For now the knowledge of operant conditioning will be related to extrinsic motivation when used in the coming parts of the thesis.

In the coming section we will look at human motivation in the perspective of computer games and how fun can be derived from the experience of emotions and the people playing said games.

5 Fun in Computer Games

In this section we want to approach the term fun in several ways. This is done in order to enhance our understanding of what fun is beyond the aspects of ordinary game design.

As we mentioned in section 1, a common view on computer games as fun, is by them inhabiting a series of interesting choices. If games are indeed made up of interesting choices, then that makes it important to understand what it is that makes choices interesting to players. This question is fundamental, or at least should be fundamental, to all game design. The interesting task is to answer it in new and various ways, and thus it becomes essential for the design of computer games.

There exist many factors for creating player interest. Essential for all of these elements is the fact, that game mechanics engage a player by offering choices and providing feedback. As we described in section 2.1.4, a computer game is a system that ultimately provides feedback to the player. Since game mechanics make up the bulk of a computer game, it is essential for them to offer the players various choices and provide feedback to the player according to the choices that they make.

If we were to ask a dozen different players about fun, we would receive an equal amount of different answers. In that regard, making sense of how people respond to the play of computer games will require both the comprehension of player experiences, and insight into the world of game design mechanics. In this section we will include relevant theories and models pertaining to the understanding of player experiences and game design.

5.1 Player Types

In this section we will look into different models mapping the motivations of players for playing computer games.

One of the most quoted persons on the subject of player types is arguably Richard Bartle. Bartle started his research in player types as he wanted to find out what *fun* meant to different players. During his research and observation of players in his MUDs (Multi-User Dungeons)[10], he discovered that players had different motivations, in-game behaviours and play styles when playing. During his initial research he identified four different types of players: *killers*, *socializers*, *explorers* and *achievers*. He describes these player types as follows:

[10] The very first MUD was created in 1978 by Richard Bartle and Roy Trubshaw at Essex University in England (Bartle, 1990).

- **Killers** are players who enjoy using tools provided by the game to cause distress to other players.
- **Socialisers** are players who enjoy using the game's communicative facilities to apply the role-playing of the game in conversations and other interactions.
- **Explorers** are players who enjoy discovering as much as they can in the virtual world of the game, both in the geography of the game as well as the mechanics of the game.
- **Achievers** are players who enjoy setting game-oriented goals for themselves and vigorously set out to achieve them (Bartle, 1996).

In Figure 13 below you can see a visual representation of the player type model.

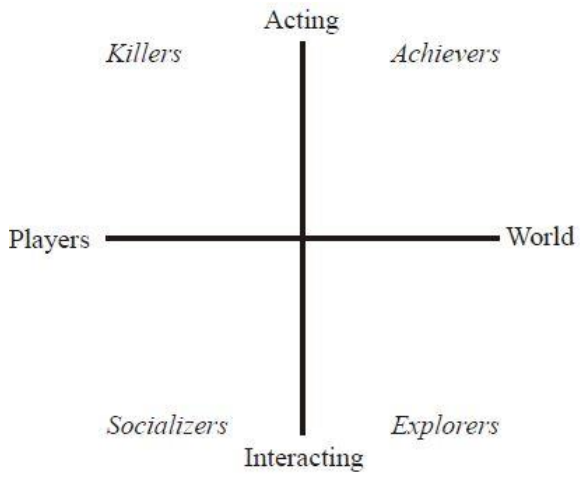

Figure 13: A visual representation of Bartle's 4 player types (Bartle, 2004)

In this figure, the player types are situated on two axes according to a player's degree of preference for interacting with or acting on the virtual world itself or its other players.

In this initial research Bartle notes that these player types were observed in virtual worlds, and therefore might not suit all types of games, and that they only apply to players playing for fun. Furthermore, he states that these player types do not overlap, meaning that the characteristics of a Killer, for example, cannot be found in an Explorer (Bartle, 1996).

Bartle has since expanded on these four player types himself, and added traits which define each of his original player types as having both implicit and explicit characteristics. By doing this, his original four player types have doubled to eight player types:

	Killers	Socialisers	Explorers	Achievers
Implicit	Griefers	Friends	Hackers	Opportunists
Explicit	Politicians	Networkers	Scientists	Planners

Table 1: The expansion of Bartle's original player types

The implicit types are generally more impulsive while the explicit are generally more calculated. For an explanation of the different player types, see appendix 9.1.

A visual representation of Bartle's eight player types can be seen below in Figure 14.

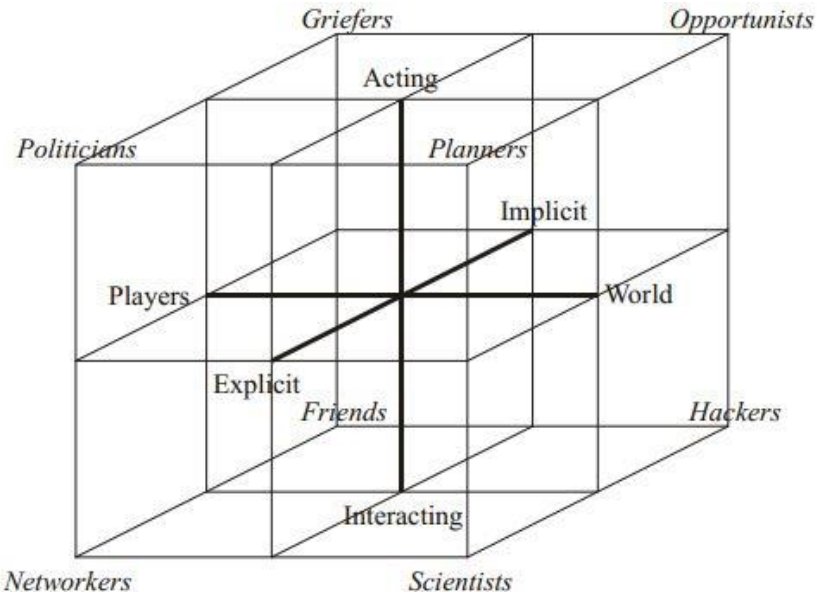

Figure 14: A visual representation of Bartle's eight player types (Bartle, 2004)

Bartle explains that players often do not stay with one player type, but drifts over time. The tendency is that newcomers to the virtual worlds start out by killing other players. When the allure of killing others wears off, they often go out to explore the virtual world. After exploring the world, gaining knowledge, they try to win the game. After winning they settle down and socialise with other players. This drift he calls *The Main Sequence* and can be viewed in Figure 15.

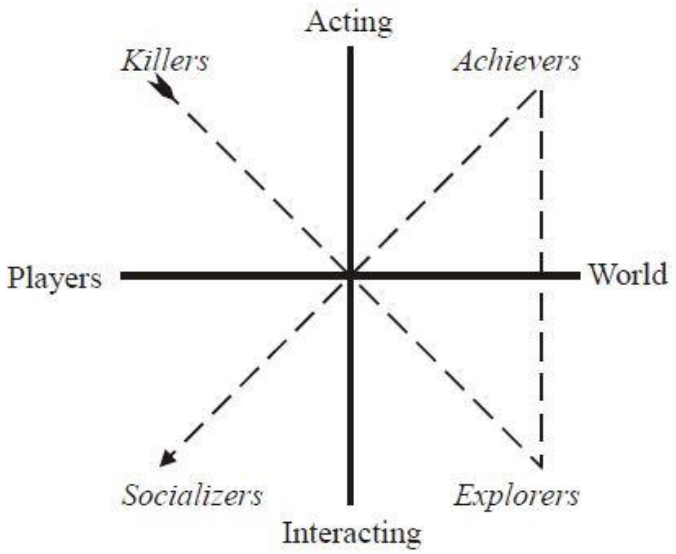

Figure 15: A visual representation of The Main Sequence (Bartle, 2004)

Adding to The Main Sequence, Bartle has also identified player type drifts among the eight new player types - two main and one minor. These sequences are:

- *The Main Socialiser Sequence*;
    - Going from Griefers to Networkers to Politicians to Friends.
- *The Main Explorer Sequence*;
    - Going from Opportunists to Scientists to Planners to Hackers.
- *The Minor Sequence*;
    - Opportunists to Networkers to Planners to Friends (Bartle, 2004).

This new model along with the drifts observed is an important update to the original model; the player types are less rigid and the drifting of players between player types shows evolvement among players.

Even though Bartle only observed these player types and the drifting of players between them in virtual worlds it is important knowledge for game developers, as virtual worlds can be translated to other game worlds – mostly open game world with an implementation of roleplaying mechanics. The accommodation for different player types in one game can help keep a player interested even when they drift to other player types.

Bartle's player types has since been updated by Nick Yee, a Ph. D. graduate from Stanford University, due to the model's specific usage area of virtual worlds and because Bartle still states that components of his player types do not relate to each other, and that types do not overlap (Bartle, et al., 2009). Yee has observed tendencies in the

world of MMORPGs[11] that this does indeed happen, which is why he wishes to update Bartle's model. He uses role-playing and socialisation as an example: in Bartle's model they fall under the same type but may not be highly correlated, whereas Yee sees correlation between the two. Another example he uses is that Achievers and Socialisers are different types, which in Bartle's model do not overlap, but in the real world do in the form of raid-oriented guilds[12], such as in World of Warcraft (Blizzard Entertainment, 2004). Yee further argues against Bartle's model because of its lack of means to determine players to what type they are, and without resolving the issue of components of a type not correlating, determining players' type might resolve in the creation of new types rather than measuring them (Yee, 2005).

In Yee's research he translated Bartle's main player types into three main components with ten subcomponents based on empirical, quantitative research on MMORPG players. He did this using a series of questionnaires based on Bartle's work (Yee, 2005). The components can be seen in Figure 16:

Achievement	Social	Immersion
Advancement Progress, Power, Accumulation, Status	**Socializing** Casual Chat, Helping Others, Making Friends	**Discovery** Exploration, Lore, Finding Hidden Things
Mechanics Numbers, Optimization, Templating, Analysis	**Relationship** Personal, Self-Disclosure, Find and Give Support	**Role-Playing** Story Line, Character History, Roles, Fantasy
Competition Challenging Others, Provocation, Domination	**Teamwork** Collaboration, Groups, Group Achievements	**Customization** Appearances, Accessories, Style, Color Schemes
		Escapism Relax, Escape from RL, Avoid RL Problems

Figure 16: Nick Yee's Player Components (Yee, 2005)

Yee is careful not to call these components and subcomponents player types, but rather psychological and social motivations to play. If we compare these with Bartle's player types, we can see that the Killer type does not have a separate component but correlates with the competition subcomponent. Furthermore, Bartle's Explorer type is a mix of both discovery and mechanics subcomponents.

Another important aspect when comparing Yee's research to Bartle's is that Yee went through the effort to make empirical, quantitative research. Bartle's research was not empirical, and thus it is hard to validate (Yee, 2005). This, along with the very specific usage area of Bartle's model, means that we will find Yee's components and subcomponents more relevant for modern computer game players. Bartle's observation of drifts between player types is still important, as it shows evolvement in players' motivations to play a game.

[11] Massive Multiplayer Online Role-Playing Game
[12] A community of players working together to complete battles against difficult in-game bosses

Now that we have had a look at in-game observations of player behaviour and motivations, we will be looking at another way of describing what players find fun in computer games.

5.2 An Emotional Perspective

Part of understanding what makes a computer game fun is by looking at the emotions we as humans exhibit when playing games. By observing our emotions it is possible to tell when we feel anger, happiness, joy, sadness or excitement. The emotions can function as clues to how we feel when playing a game, but as we will see it is not always that easy to find out exactly how we feel during play. In trying to make sense of the way people respond to playing a computer game we will make use of Nicole Lazarro's model of player emotions for exploring player experiences (Lazarro N. , 2004).

Good game mechanics are separated from the more boring ones in how captivating they can be, and how fast and completely the choices absorb the player's attention. Essentially, good games can be measured by how well they create an emotional response in a player. Furthermore, good gameplay requires ease of use so that players can access the fun of a computer game. As with other forms of interaction with digital media, players must know what to do (know how to swing a sword in a role-playing game, for instance), and they must be able to easily discover the play opportunities (e.g. find fun and entertaining things to do with a gravity gun in Half-Life 2 (Valve Corporation, 2004) as illustrated in Figure 17). Fundamentally, player experiences need to spark player engagement and emotion (Bartle, et al., 2009, p. 4).

Figure 17: Using the gravity gun in Half-Life 2 (Valve Corporation, 2004)

One of the main problems with games arises in situations where players know how to play, but not how to have fun. In this regard, Lazarro operates with two distinct terms: *usability* and *fun factor*.

The issues of usability is related to the way a player is making choices in a computer game, and the fun factor is related to the elements that make those choices interesting. In order to define these two aspects she uses the following terms:

- ***Usability Experience (UX)***: The accessibility of the computer game controls and the ease of which the players can accomplish what they expect.
- ***Player Experience (PX)***: How well a computer game provides the type of fun that players wish to have – It is not possible for players to just press a button and feel that they have won (Bartle, et al., 2009, p. 5).

The purpose of dividing features into these two categories is to compare the accessibility and fun factors of a game, and thus finding out the different values that research into user experience and player experience strive to fulfil. The categorisation can be seen in the table below:

UX Usability Goals: Productivity	**PX Game Goals: Entertainment**
Task completion	Entertainment
Eliminate errors	Fun to beat obstacles
External reward	Intrinsic reward
Outcome-based rewards	Process is its own reward
Intuitive	New things to learn
Reduce workload	Increase workload
Assumes technology needs to be humanized	Assumes humans enjoy being challenged

Table 2: User and player experiences strive to fulfill different values (Lazarro & Keeker, 2004)

Lazzaro provides a perfect metaphor for thinking about user experience and player experience in cooperation and the values that they fulfil:

"(...) much like the two wheels on a bicycle. One wheel connects to the drive chain to make the bike go (UX), and the other wheel steers and creates the fun (PX)." (Bartle, et al., 2009, p. 5)

The UX wheel incorporates several methods for improving the overall user experience of a game, and these methods try to eliminate the given errors in a system. The methods known from human-computer interaction have been utilized in game development in order to assess the experience of using the computer game in question and among these counts: heuristic evaluation, time to completion and player surveys on satisfaction. The goal of the thesis is not to investigate the field of user experience design, but knowing that these methods largely improve the interface design and quality of the user experi-

ence. One thing we have noticed is that UX can be connected to the interactivity of a system as described in section 2.1.5.

The problem with usability is not the attempt to improve the fluidity of the user experience, but rather that it does not address the fun factor of a game. This is where the force of player experience design comes in and aims to improve all the aspects of interactive experiences that humans enjoy at play. Thus the focus of player experience design is also to enhance the emotions arising out of play (Bartle, et al., 2009, p. 6).

Now that we have introduced the concepts of user experience and player experience we want to dive into the subject of emotions in computer games from the perspective of Nicole Lazarro.

According to Lazarro, emotions relate directly to a person's goals and are therefore involved in player experiences. There are many reasons for play, and people play everything from casual, mobile games like *Subway Surfers* (Kiloo, 2012) to Tower Defence[13] games like *League of Legends* (Riot Games, 2009). The reason for this could be to achieve a sense of accomplishment, to relax or to feel excited (Bartle, et al., 2009, p. 6). One of the theories for engaging in activities is related to the theory of flow (as we described in section 2.1.6). Furthermore, many players use computer games to alleviate the unpleasant emotions of stress or frustration. These emotions can come from their workspace and when they finally get home after a long day of work they are able to use computer games to abstract from them (McGonigal, 2011, p. 3). For a complete list of emotions found through research on facial gestures see appendix 9.3.1.

5.2.1 Emotions

How exactly does emotion relate to the structure of a computer game? The following figure is a visual representation of the connection between game mechanics and emotion.

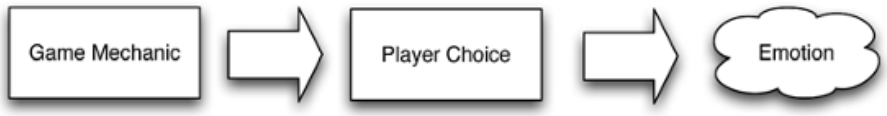

Figure 18: The creation of emotion by way of game mechanics (Bartle, et al., 2009).

What game designers are able to do within the boundaries of a computer game is to design the game mechanics and rule structure that players can engage with. These game mechanics are the vehicles of engagement and emotions can emerge from the process of making

[13] A genre of computer games involving the defense of a base from oncoming attacks of enemy NPC's (Non-Playable-Characters)

decisions, based on the available game mechanics. This is not to say that the audio-visual side of computer games does not play a role as they provide emotions from visceral responses to the audio and visuals presented to the player (Bartle, et al., 2009).

According to Lazarro, there are five distinct roles that emotions can fulfil in increasing player engagement within a game, and these are outlined below:

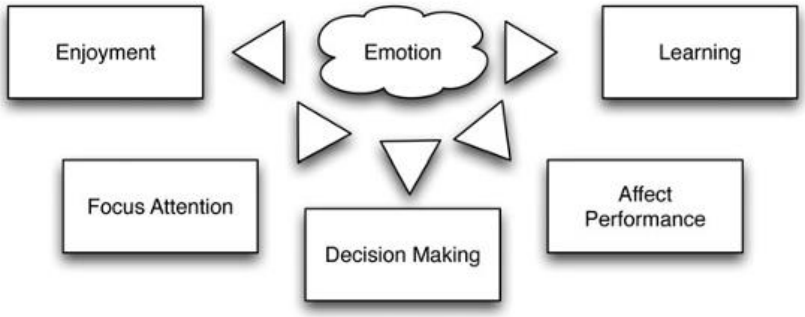

Figure 19: Emotions play a central role in computer games (Lazarro N. , 2007).

The five principles can be described as:

Enjoyment: Players are able to enjoy the variety of sensations that emotions facilitate.

Focus attention: Emotions ultimately affect the players focus. An example could be when being attacked by an enemy tank in *World of Tanks* (Wargaming.net, 2010), a player could experience the emotion of frustration and inadvertently lose focus and stop protecting his comrades.

Decision Making: Emotions aid in the making of decisions. An example of this could be when you are faced with the choice of certain death or escape through a window unto a ledge of a high building as in *Left 4 Dead 2* (Valve Corporation, 2009) where you will have to escape from zombies by performing that exact action.

Performance: a *first-person shooter* (FPS) like *Battlefield 3* (EA Digital Illusions, 2011) can foster negative emotions as you perform the repetitive behaviour of shooting an enemy and moving on, whereas a computer game like *Minecraft* (Mojang, 2009) can foster positive emotions and inspire creativity by providing players with endless tools for building a world of their own.

Learning: Emotions reward the process of learning, and playing computer games is essentially learning the patterns of play and the skills necessary to perform well in a game. For example, emotions reward us when successfully learning to solve a puzzle of spacial nature as in *Portal* (Valve Corporation, 2007) (Lazarro N. , 2007).

The role of emotions in computer games plays a significant part in recognizing that there are ways of developing games that fosters different play styles and positive behaviour. As opposed to our description of the findings of B. F. Skinner where emphasis is on delivering the right reward structure (and thus encouraging addictive behaviour), emotions in games and game design is important to the player experience. The role of Nicole Lazarro's findings is relevant to understanding exactly how players enjoy computer games and what motivates them to take action.

5.3 The Four Fun Keys

In 2000, Nicole Lazarro performed research at XEODesign with the purpose of categorising the emotions that could arise from specific game mechanics. The emotions that the players experienced were grouped together, and by grouping the players' favourite game mechanics (based on their emotions) four distinct play styles were revealed. These four patterns of play were denoted *The Four Fun Keys* because each play style suited a collection of game mechanics which in turn unlocks a different set of player emotions (Lazarro N. , 2004). These emotions can be reviewed in appendix 9.3.

5.3.1 Hard Fun

The main trait of the Hard Fun play style is that players will dedicate themselves to the mastery and accomplishment of a challenge. The mechanics of Hard Fun motivate and focus by requiring mainly skill to complete a goal. The play style is called Hard Fun because the game mechanics reward the player's hard work – work that often leads the player to become frustrated, but when finally overcoming the obstacle the player will feel the emotion of *fiero* (i.e. triumph) (Bartle, et al., 2009, p. 26). The play style is illustrated in Figure 20.

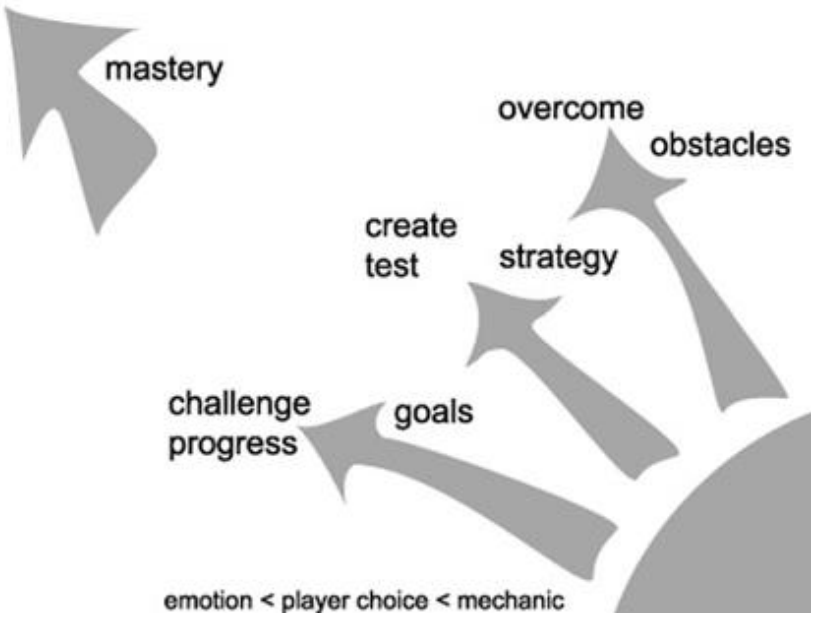

Figure 20: Hard Fun PX (Bartle, et al., 2009, p. 26).

5.3.2 Easy Fun

The main characteristic of Easy Fun is how player choice rewards players with the opportunities for exercising their imagination. The three elements uncertainty, ambiguity and iconic stories drive the emotion of curiosity by providing what Will Wright[14] calls *interesting failure states*, and also the sensation denoted by Hal Barwood[15] as *the joy of figuring it out*. Furthermore, players can express their creativity both through player-generated content and role-play, while at the same time details encourage the players to explore the virtual game world – thus providing the chance of being surprising by stumbling upon new things. The emotion of surprise and the discovery of new things also evoke awe and wonder (Bartle, et al., 2009, p. 33). The play style is illustrated in Figure 21.

[14] A game designer who invented the computer games *The Sims* (Maxis, 2000) and *SimCity* (Maxis, 1989).
[15] A game designer who worked on titles such as *Indiana Jones and the Fate of Atlantis* (LucasArts, 1992)

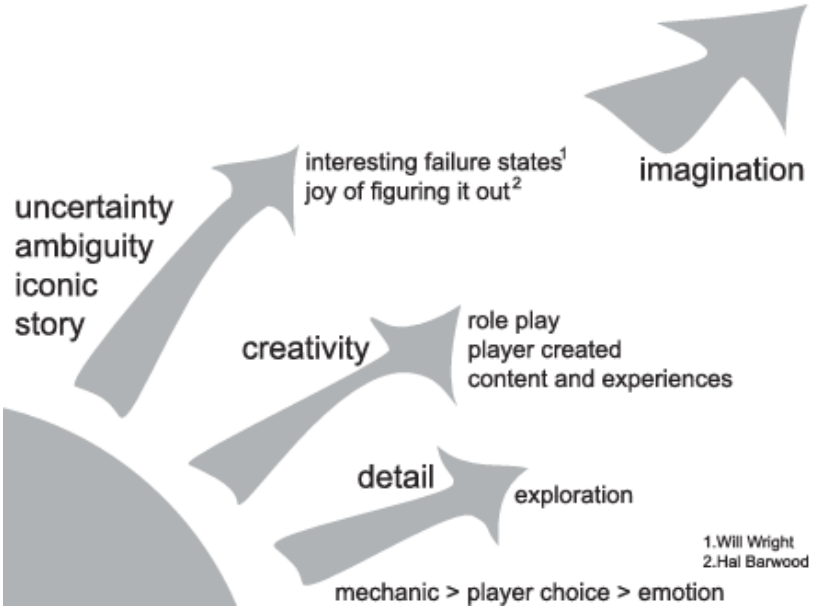

Figure 21: Easy Fun PX (Bartle, et al., 2009, p. 33).

5.3.3 Serious Fun

The main trait of Serious Fun is for player choice to provide players with the opportunities to form elements of perceived value. Computer games providing stimulation produces emotions like excitement and relaxation, depending on the context for which players engage in serious fun (e.g. when coming home from work and wanting to relax and let loose from frustration). Practicing skills in computer games produces either health or learning improvements or the use of rhythm-based games or similar techniques allow players to enter a state of "zen out" which can be related to a state of flow. Exactly the state of flow serves the goal of eliminating negative emotions like boredom and frustration – as they all connect with the player's chosen values (Bartle, et al., 2009, p. 39). The play style is illustrated in Figure 22.

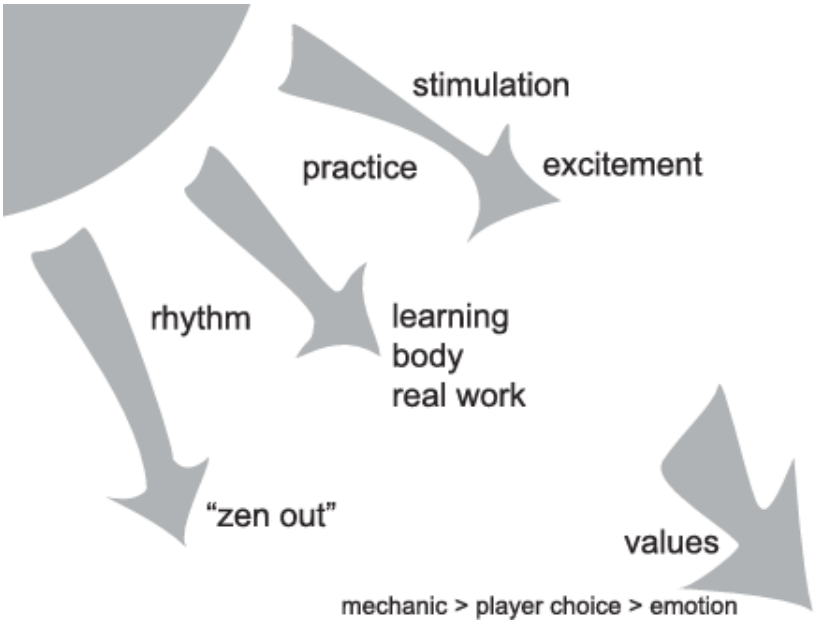

Figure 22: Serious Fun PX (Bartle, et al., 2009, p. 39).

5.3.4 People Fun

Finally, the fourth fun key is People Fun, and the main trait for this key is how player choice rewards players with moments of social interaction. The interaction between players creates competitive and cooperative situations alongside opportunities for leading, mentoring or performing. Personalization and player-generated content facilitates self-expression and creation of more personal spaces, and also fan communities. Furthermore, even though players interact with NPC's the same bundle of social interaction possibilities can be facilitated. Overall, this play style serves the goal of creating relationships in and around the given computer game (Bartle, et al., 2009, p. 45). The play style is illustrated in Figure 23.

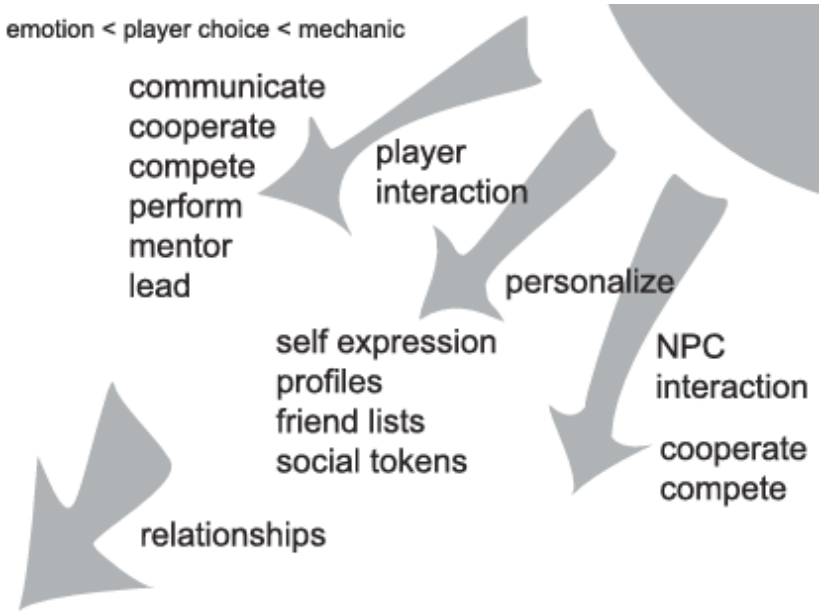

Figure 23: People Fun PX (Bartle, et al., 2009, p. 45).

In Figure 24 a summary of the Four Fun Keys is illustrated.

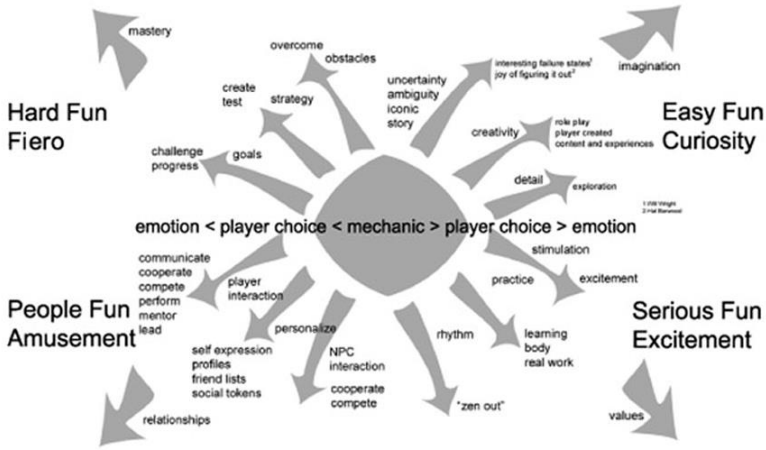

Figure 24: Summary of the Four Fun Keys (Bartle, et al., 2009).

5.3.5 Summary

Understanding the purpose and value of emotions allows for framing the possible motivation that players have for computer games. The Four Fun Keys can put a perspective on what it is that players find fun and why they wish to play. This framework is based on extensive research involving observation of the emotions that players show and the categorisation of game mechanics are relevant to our understanding of game design and how it can be connected to player motivation.

6 Analysis

Having covered the different fields of theory concerning human and player motivation alongside patterns for fun in and around computer games, it is now time to connect the different theoretical approaches. This is done in order to find out how human motivation can be connected to existing computer games – thus giving knowledge on the different elements of computer games that best afford the experience of fun and what motivates us in those games to continue playing for a period of time.

This following section will contain the collection of data from existing computer games followed by the analysis of these games as seen from the theoretical perspectives described in the first half of the thesis. The purpose of bringing examples from existing computer games to the table is to be piecing together the different fields of theory, and also in order to see how they apply to these computer games. The interesting aspect of analysing computer games by using knowledge on Player Components and the Four Fun Keys is to deliver an answer to how player motivation can be connected to human motivation.

The section will be structured in the following way: first, we will introduce and describe the method for collecting data. Then we will describe the method for analysis and the components needed for interpreting the content of the chosen computer games subject to analysis. Finally, the methods will be applied to the computer games we have chosen and an indebt analysis will be performed with a summary on the content of the computer games and their connection to the theoretical fields in question. At the end of this section we will provide an overview of the results of the analysis.

6.1 Data Collection

The following section will contain material regarding the collection of data which will be used for the analysis. In this section the number and nature of computer games chosen for analysis will be described alongside the structure from which the data collection will happen.

SDT will be part of the basis for choosing which computer games to analyse. As criteria we will use the three basic psychological needs: competence (C), autonomy (A) and relatedness (R). For each game listed, an assumption of the content will be made and the games will be rated with either C, A, R or a combination of these (for simplicity we will rate them with an “X” for the need which the game is believed to fulfil primarily, and subsequently we will rate other needs with a smaller “x” - if there are needs that are believed to be of secondary importance). Another criterion is that the computer game in question has been played by the authors. This is done to ensure that

the content of the games that are submitted for analysis is known in detail.

Computer Game	Need Satisfaction		
	Autonomy	Competence	Relatedness
World of Tanks	-	X	X
Skyrim	X	-	X

Table 3: Computer games chosen for analysis.

As illustrated above we have chosen two computer games for the analysis. The reason that there are only two games is that we find both games to be very broad in terms of content and game mechanics. These two games are also very popular among players and have both won several awards since their release (for further information on the games, see appendix 9.4).

6.1.1 Framework for Data Collection

For each game that we choose in connection with the analysis, we will make use of the computer game definition presented in section 2.1.4. The elements of this definition will function as framework for categorising the formal elements and structure of the computer games. When the structure has been determined and the description of said structure is complete, the data will be used in accordance with the analysis. The data collection structure will be formed as the table below:

Game Definition Structure:	Computer Game:	Examples:
Goals		
Rules		
Feedback		
Quantifiable Outcome		
Voluntary Participation		

Table 4: Data collection framework.

The purpose of the data collection is to provide material for a qualitative analysis in which we will make use of the theories which were covered in the earlier sections. By collecting data from the computer games it is our intention to try to cover the fields of theory that we have chosen to use as framework for understanding fun in computer games and people's motivation for playing them.

The analysis will not include several computer games and we are well aware that this means it might not be representative in any way. Despite this, we will be performing qualitative analysis in order to

identify the key elements in computer games related to SDT, The Four Fun Keys and player type theory, and compare these findings to the theoretical framework (Preece, Rogers, & Sharp, 2002).

6.2 Method of Analysis

In this section we will describe the method for analysing the data collected for each game.

The analysis will be a four step method with a summary of the results presented in a table at the end of each step. First step is to ascertain which aspects of the data correlates to the Player Components. This is done in order to determine which aspects of a game enable certain player activities and motivations. Second step is to do the same with the Four Fun Keys, except the purpose here is to find out which game aspects enables certain player emotions, thus identifying the elements of the computer game that can be said to be fun. Third step is to then compare the now categorized game aspects with SDT to see which aspects fulfil internal motivational parameters. Fourth step is to identify and conclude which aspects fulfil external motivational parameters.

The reason for this four step method is to narrow down the vast theoretical area which internal and external motivation covers whilst attempting to identify the patterns of play that makes the computer games fun and engaging. We use this method as a guideline to compare the elements of the motivational theories with the game aspects in a more concise way.

The resulting tables to post the results in will look like this:

Player Components	**Mechanics**
1. **Achievement** 2. Advancement 3. Mechanics 4. Competition	
1. **Social** 2. Socialising 3. Relationship 4. Teamwork	
1. **Immersion** 2. Discovery 3. Role-Playing 4. Customization 5. Escapism	

Table 5: Player Components Table

Fun Keys	Mechanics	Examples
Hard Fun (Mastery)		
Easy Fun (Imagination)		
People Fun (Relationships)		
Serious Fun (Values)		

Table 6: Fun Keys Table

SDT	Player Components	Fun Keys
Competence		
Autonomy		
Relatedness		

Table 7: SDT Table

6.3 The Elder Scrolls V: Skyrim

The purpose of the following section is to apply the framework for analysis on TES V: Skyrim (just Skyrim, for future reference). We will begin by looking into the possible Player Components. The Player Components will be listed in chronological order according to what we find present in Skyrim and its game world.

Skyrim is a single-player action role-playing game in which a player can create a character and explore the world of Skyrim through patterns of exploration, dialogue and combat. For further information on the game see appendix 9.4.2. Below is the data collection table for Skyrim.

Game Definition Structure	Computer Game: TES V: Skyrim	Examples:
Goals	• Complete the main quest • Level up your avatar • Obtain new skills (combat or exploration) • Defeat various enemies (NPC's) especially dragons • Win the civil war for one of the warring factions • Explore the story of the Dragonborn • Explore the world of Skyrim • Obtain game-related achievements	• Use combat skills to level up your avatar • Complete in-game quests to move different storylines forward • Fight enemies using melee, ranged or magic attacks • Engage in dialogue with various NPC's • Traverse the game world to explore: country-sides, dungeons, caves, strongholds, etc. • Achievements are platform-specific (e.g. Steam has its own achievements for Skyrim)
Rules	• The player controls an avatar of his choosing (either in first-person or in third-person perspective) • The player will receive quests from NPC's and through the Radiant Story system • Continuous use of skills will level up an avatar • Perk point is given to the player for every level gained • Three attributes governs the avatar's condition: Health, Stamina and Magicka; either one of these attributes can be upgraded during levelling of the avatar • Attributes can be increased when levelling up • Movement in general is governed by similar rules known from the real world • The player can change the difficulty of the game • The player can customize the avatar's appearance, skills and abilities for specific preference • The player can choose to use 18 different skills listed under 3 categories: Thief, Mage and Warrior • Different locations in Skyrim have different inherent difficulties • When a skill reaches maximum it can be converted to a "legendary skill"	• The player can choose from six different races (each with specific abilities), and can customize gender and looks • Engaging in either conversation with NPC's or exploring the world can trigger a quest • Fighting with an axe will increase the avatar's Blunt-Weapon Skill; every time the player uses a skill a small amount of experience in that skill is gained • The perk points can be assigned to any skill; perk points can be saved for later use • Health governs the vitality of the avatar; Stamina governs the amount of attacks and sprinting the avatar can perform before being fatigued; Magicka governs the amount of magic spells the avatar can use (The player begins the game with 100 points in each) • Either one attribute can be increased by 10 points • As a starting point, it is not possible to levitate or move through solid objects like walls • Difficulty can be changed in the game menu, even during a battle • The player is able to outfit the avatar with different kinds of armour (Heavy/Light Armour protection against attacks from enemies) • The Thief governs the thief skills Lockpicking, Pickpocket, Sneak, Speech, Alchemy and Light Armour; Warrior governs the combat skills Archery, Block, Heavy Armour, One-Handed, Two-Handed and Smithing; Mage governs the magic skills Alteration, Conjuration, Destruction, Illusion, Restoration and Enchanting • The game world features areas in which certain enemies with a certain difficulty level will appear; it is very challenging to defeat these enemies without the proper character level or skill • The maximum skill level is 100 and making a skill legendary resets it to 15 points and also resets all perk points for free distribution
Feedback	• Feedback on the physical condition of the avatar and navigation of the avatar • The player can track his/her level progress on-screen • Audio-visual feedback • Storyline progression	• HUD: shows a Health bar, Stamina bar and Magicka bar; foes and locations will show up on the screen with icons; a compass shows the direction in which the player moves • A bar showing the progress in levels is shown when the avatar gains a new level • When the avatar is hit the screen blurs out; objects and NPC's make sounds when interacting with them • Players can keep track of how far they have come in a quest through their Journal or via notifications on-screen as a quest is updated
Quantifiable Outcome	• The player is rewarded whenever he/she completes a quest • The player is rewarded with XP by using his/her skills • When levelling up the player is rewarded with a perk point	• Rewards come in the form of gold, items, XP, abilities, skill points or clues to quest or storyline • Using a two-handed weapon increases the skill level of Two-Handed Weapons • Perk points can be used on a Skill Tree to unlock new perks for that skill
Voluntary Participation	• A player can start a play session of Skyrim at any time and can also quit at any given point	• The player can save the game through the game menu, and the game also features an auto-save function

Table 8: Data collection table for Skyrim

6.3.1 Step 1: Player Components

Comparing the data collected to the Player Components it is evident that the two categories, Achievement and Immersion, are present within the game, and we will begin by analysing these two components and their subcomponents in Skyrim.

6.3.1.1 Achievement in Skyrim

As we can see in the data collection table, the game accommodates Advancement, Mechanics and Competition. Overall, achievements can be earned in Skyrim and are given as descriptive titles: using al-

chemy to create potions can yield the *Artificier*-achievement. These kinds of descriptive titles are largely dependent on the platform that the player uses (i.e. if the game is played via the Steam platform achievements will appear on the player's profile). Even though the player can gain achievements in the form of honorary titles, the player can also defeat various challenging enemy NPC's which counts towards an achievement in itself. As we will see there are many forms of achievements in the game which can be identified by using the subcomponents.

Looking at Skyrim in terms of Advancement, and seeing that it is a single-player RPG, it is in the very nature of Skyrim to incorporate mechanics of advancement. One of the goals of Skyrim is to create, customise and level up an avatar. Creating and playing an avatar in Skyrim entails choosing which character to play and how to play it. The process of playing an Orc warrior, fighting every possible enemy using heavy armour and two-handed weapons might very well turn into a play style in which the player finds it more fun to be stealthy and thus going down the path of being a thief instead. No matter how the player chooses to approach the world of Skyrim the progress of any given avatar is profound.

Levelling up you avatar plays a large role in Skyrim, and in order to accommodate the advancement of the player it is based on an experience system related to skills. When you use a skill, you automatically receive an amount of experience points (skill points) in that particular skill. Eventually the amount of experience gained will cause a skill to level up (i.e. see Figure 25).

Figure 25: Increasing light armour skill by taking damage

The system of advancement is put together in a way that no matter which skills the player use, those skills will be the ones to upgrade fastest depending on the usage (e.g. if the player uses one-handed weapons in combat, the One-handed skill will be the one to level up). As intended in the game design, increasing the levels of your skills is

the only way it is possible to increase character experience points. As the character level increases, a larger amount of character experience is needed to gain a new level.

Another aspect of levelling up a character is that the player will have to make some decisions regarding the abilities that the avatar has. There are two permanent character changes that can be made when levelling up (see Figure 26):

- One attribute (Health, Magicka and Stamina) can be increased by 10 points (each attribute start with 100 points; the High Elf race starts with additional 50 points in Magicka). The choice for an attribute to increase is given every time an avatar reaches a new level.
- One perk point will be awarded per character level. Perk points can be used to improve a skill and may be saved up for a time when the player feels like investing them.

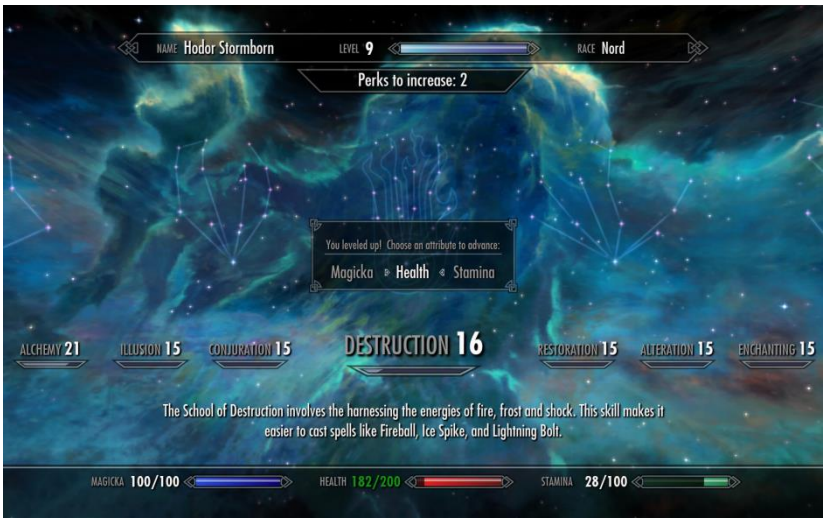

Figure 26: Levelling up in Skyrim

In addition to the character levelling system, Advancement in Skyrim is presented in ways of the NPC's encounters. The player begins the game by encountering low-level enemies, but certain areas of the game world features high-level foes which can be defeated only if the player reached a certain level of combat skills. Skyrim is built upon a levelling system in which some NPC's has a certain level and other NPC's scale in level alongside the avatar's level. This ensures that the player will have to work on his avatar's skills in order to face the many challenges that the player will face in the world of Skyrim.

In terms of Advancement, there are other ways for a player to advance in Skyrim beyond the character related skills and abilities. Oftentimes, the player is given a quest as a result of an event in the game (e.g. a bandit attack on an innocent bystander prompting the player to help; or the player reading a book giving information on a legend worth investigating). Besides receiving various rewards for

completing a quest, there is a natural progress in learning more about the different storylines that these quests impose, but also to reach the conclusion of each quest resulting in advancement in larger quest lines (e.g. completing quests related to the civil war in Skyrim).

Mechanics as a subcomponent does also play a large role in the playing of Skyrim. Seeing as the game is largely based on an elaborate skill-related levelling system, it invites the player to make decisions regarding play style and the abilities that the player's avatar possesses. If the player wants to, he can invest a considerate amount of time figuring out how to optimize the skills that are essential to the role-playing of an avatar (e.g. being a warrior it might be necessary to forge your own armour, and by improving the Smithing skill increase the chance to create better armour). In addition to optimizing skills, the player can use in-game items to give temporary boosts to relevant skills (e.g. as in the example with smithing the player might create a potion boosting the overall smithing skill resulting in better armour than normal). Optimizing skills can be quite a number crunching affair since items in the game give a certain percentage in boost depending on the ability of the item (e.g. the player might discover a set of steel gloves giving 20% of extra damage when using two-handed weapons). Skyrim is filled to the brink with items and treasures affecting the abilities and appearance of an avatar and as such allows the player to tap into the underlying patterns of optimal gameplay and understanding of the way the system works. This can lead the player to use a considerate amount of time devising strategies and testing possible scenarios with the best possible outcome.

In terms of Competition, the game relies solely on the various NPC's that can be encountered when travelling the vast expanses of Skyrim. Opposite a MMO, in which players meet other players from the real world, the players of Skyrim will only meet those NPC's that were destined to be there by the developers of the game. Nonetheless, it is possible to say that the subcomponent Competition is present in the sense that the player is competing with both the friendly and hostile NPC's of Skyrim. As an example, the dragon fights, in which you can engage, is a struggle to emerge victorious against the powerful strength of an ancient mythical creature. Just as a player might find joy in competing with and dominate other players, they can find excitement and joy in dominating and competing against enemies in Skyrim. Furthermore, the interaction between the player and NPC's play an important part in the Competition component as the player needs to accept the rules and boundaries of interaction in Skyrim. Committing crimes has similar consequences to that in the real world and is seen as provocative behaviour by the NPC's: stealing and murdering in any of the major cities will be frowned upon by the general population and the authorities, resulting in the player having

to decide whether to go to jail, bribe the authorities or fight their way out.

6.3.1.2 Immersion in Skyrim

Looking at the analysis of the Achievement component of Skyrim and the data collection table it is already possible to conclude that the game of Skyrim is incorporating Immersion by nature. The game was intended and developed as a single-player role-playing game and as such emphasizes the elements of Immersion.

When playing Skyrim you, as the player, are presented with an open-world which can be traversed by either foot, horse or carriage (and the occasional option to enter the map through a menu and choosing to fast-travel to a location, depending on how much you intend to do role-playing). The whole way that the game is structured calls for Discovery in the sense of exploration (which is also one of the goals of the game), and the desire to find hidden items and lore on the world of Skyrim. Figure 27 shows just how vast Skyrim is, which affords Discovery.

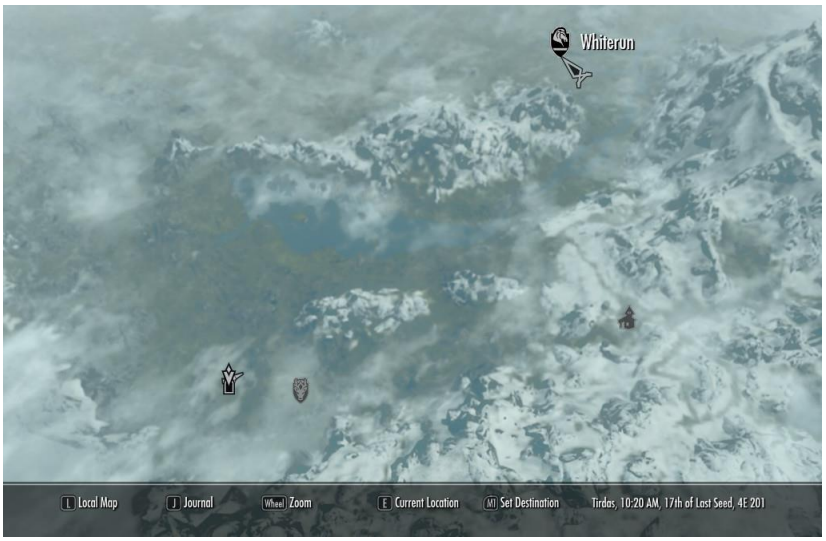

Figure 27: Map showing a part of the world of Skyrim

Oftentimes, the best way to play the game is when you have a quest to fulfil and need to travel from one location to the other. An example could be, as part of the main quest, to travel to the top of the largest mountain in Skyrim (called the *Throat of the World*) and visit the group of *Greybeards* (a gathering of old, wise men) located at the top. Even though you might have visited the location already (needed for fast-travelling) it might be a better idea, gameplay and immersion wise, to walk there on foot. Only then is it possible for the player to explore the country-side and discover the many secrets hidden within. Thus Skyrim is a game heavily relying on Discovery, as the player is required to use a map to travel to different locations in order to complete various quests.

Just as Skyrim is dependent on Discovery, its core design is built up around Roleplaying. As the data collection shows, the game is all about character creation and how the player chooses to advance the avatar throughout the game. This lets the player immerse himself in the universe of Skyrim and the roles that can be played. In Skyrim it is possible to perform several roles: warrior, thief, mage, wanderer, outlaw, hero, assassin, etc. This can be done by using the 18 different skills presented to the player through the elaborate skill trees (see Figure 28).

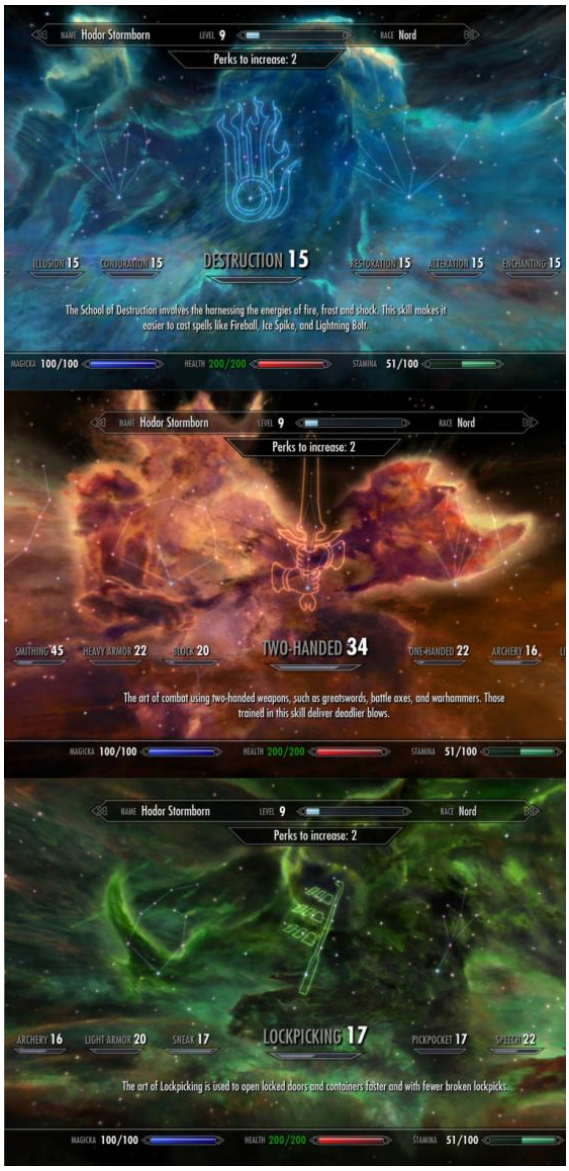

Figure 28: A wide varity of role-playing options through skills

Furthermore, the world of Skyrim is filled with contextual lore, magic, magical creatures and weapons – enough to sate the hunger of any player wanting to roleplay. Developing an avatar's abilities is not the only aspect of roleplay presented in the game – the storylines and questlines of the game universe poses the player with many interesting dilemmas and requires the player to make game-changing choic-

es: joining either of the warring faction in Skyrim has consequences for each side and the general population's predisposition towards the player. Most importantly, the main goal of the game is to play the game as the Dragonborn – a character with the ability to use dragon-shouts to defeat other dragons. Whether the player chooses to do so is just another testament to the roleplaying capabilities of Skyrim and the emphasis on the player making his own choices.

In addition to the aforementioned subcomponent Roleplaying, the player can customize the equipment and appearance of his avatar – adding to the depth of Roleplaying mechanics in the game. As far as Customization go there is no limitation to the way a player can customise the chosen avatar (apart from using only the items in the game universe). Skyrim features a whole range of armour that the avatar can be customised with (e.g. heavy or light armour in a range of different materials: steel, iron, silver, leather, fur, etc.). Furthermore, it is possible for the player to don his avatar with more formal looking clothes giving the character the air of being a citizen in the world of Skyrim. Another core to customisation is the possibility for the player to improve several crafting skills, allowing the player to create potions, armour, enchantments to existing items, and even jewellery. Customisation in Skyrim is comparably rich and this enhances every other aspect of the Immersion component for Skyrim.

Finally, we can take a quick glance at the subcomponent Escapism. It is not hard to find incentive for using Skyrim as a means to escaping real life problems, or for taking a break away from everything. The whole structure of Skyrim affords a player to enter and immerse oneself in the peculiar game universe, thus providing a means for escaping possibly daunting real life problems while excelling at playing a character in Skyrim.

6.3.1.3 Social in Skyrim

Having looked at the subcomponents of Achievement and Immersion it becomes clear to see the premises of interaction in Skyrim. The developers have created single-player experience in which the world of Skyrim is inhabited with NPC's (in the form of townspeople, bandits, guards, dragons, hunters, inn patrons, etc.). Therefore, the social interaction between players and NPC's is deeply affected by how well both the NPC's and their stories are integrated into the game universe. This will also be the premise for talking about the Social component. Even though there is no real interaction between human beings during the course of playing Skyrim, the dealings with the characters encountered in Skyrim can be of great importance: if they fail to engage, then the playing experience will suffer. Skyrim consists of nine regions (or holds), each having its own major city or village. In addition to the major cities there are a number of smaller villages and settlements scattered throughout Skyrim. As NPC interac-

tion plays an important role, it quickly becomes essential for the player to visit these inhabited locations in order to explore the various dialogues that the game consists of.

In terms of Socialising, the player is able to explore different settlements and strongholds in Skyrim and thus receive various quests. Actually, a large portion of quest-giving in the game is performed by interacting with inhabitants of Skyrim, and only a small part of the quests are triggered by finding quest-giving items in the wilds. Thus the player relies heavily on the needs of the NPC's in Skyrim and the ability of them to convey their needs through storytelling and narratives (e.g. when walking into a general goods store in the village of Riverwood the player overhears a conversation between a man and a woman discussing the theft of a valued item, which can be seen in Figure 29). Helping out NPC's is a big part of playing Skyrim and it is fuelled by way of the heroes narrative, meaning that the player is the hero and the inhabitants are the ones in need of a mighty person to come by and help them out.

Figure 29: Helping out NPC's in Skyrim

Looking at Skyrim in terms of the Relationship subcomponent it is more difficult to see how the player can excel. The only meaningful relationship possible to forge is by gaining followers (it is possible to become a Thane of a stronghold and thus be assigned a personal steward. Followers can also be hired as mercenaries and the like). It is possible for the player to have the followers help them out in dire situations against hostile NPC's, and it is also a possibility for the player to have his avatar marry their follower. This is the closest thing the player will ever come to what can be classified as a meaningful relationship in the game. The way the game was designed only allows for a fixed number of quests and storylines connected to these quests. Even though the player is able to engage in dialogue and

choose how to respond to an NPC, it is possible to exhaust the various choices in a dialogue, thereby triggering the same responds from an NPC. Overall, this can limit the possibility for meaningful conversations with NPC's around the world of Skyrim.

Finally, we can analyse Skyrim in the terms of Teamwork. Again, we can turn to the interaction between NPC's and the player. The only form of teamwork or group effort encountered in Skyrim is by gaining followers. As the term implies, the NPC's will follow the player's avatar wherever they might go in Skyrim, and help them out in situations where the power of enemies might be too much for the player to handle by themselves. As such, the use of followers provide player with a strategic supplement to their own combat abilities (which might be helpful when playing on a higher difficulty). It is possible for a player to decide the equipment that a follower can carry and wear – this does in a sense allow for teamwork on how to best face different situations in Skyrim. In addition to the appearance of the follower, the player can issue commands to the follower allowing them to carry items, open locked containers, search containers, wait at a given location, pick up items, mine ore/chop wood, use staves and scrolls (magic), sleep in a bed or activate an object (e.g. levers). In Skyrim, there is a distinction between permanent and temporary followers: permanent followers will be available after the completion of a specific quest and temporary followers are accompanying the player during the course of a quest. The feature of having followers in Skyrim adds to the depth of gameplay and to the Social component. Having followers impacts the ties that a player might have to the game universe and as such it can influence the subcomponent of Teamwork.

6.3.1.4 Summary

Now that we have analysed Skyrim in terms of Nick Yee's Player Components it is time to sum up the findings. The summary comes in the form of the table below:

Player Components	**Mechanics**
1. Achievement 2. Advancement 3. Mechanics 4. Competition	1. Platform-specific achievements; honorary titles 2. Character creation and level system; quest-completion; combat, dialogue and exploration; achievements 3. Character level system, skill system, creation of items with various stats 4. NPC interaction
1. Social 2. Socialising 3. Relationship 4. Teamwork	• NPC interaction; dialogue
1. Immersion 2. Discovery 3. Role-Playing 4. Customization 5. Escapism	1. Single-player RPG 2. Exploration (on foot, horse or fast-travel); different locations (levels like dungeons, caves and fortresses) 3. Storylines; questlines; character creation; fantasy universe 4. Character creation and customisation (choosing race, gender and appearance) 5. Story; character creation; exploration; Immersion components for escapism

Table 9: Summary of Player Components

6.3.2 Step 2: The Four Fun Keys

Now we will analyse Skyrim using the framework of the Four Fun Keys.

6.3.2.1 Hard Fun

We begin by looking at Skyrim in terms of the play style Hard Fun. As we have mentioned before there are three player choices at work in Hard Fun: goals, strategy and obstacles. Each of these is of course based on the collection of game mechanics available. The purpose of these player choices is to deliver an experience of mastery.

Skyrim delivers on all of these player choices with the mechanics that the game contains. Goals in Skyrim are largely defined by way of the quest system: this is how the goals of the game are conveyed to the player and how the player can keep track on his progress throughout the game, as seen in Figure 30.

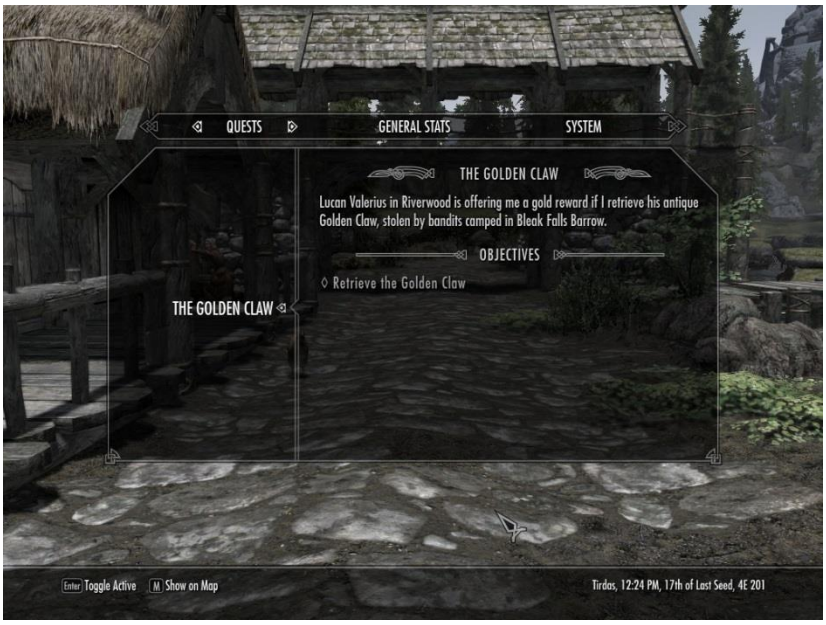

Figure 30: A quest given in Skyrim

Both challenge and progress are defined depending on the quest that the player pursues. If the goal of the player is to pursue the main goal of investigating the appearance of dragons and to stop the most powerful dragon in the game, the challenge will lie in building an avatar suitable for fighting such a dragon. This is where the skill system of Skyrim comes in: the player has the possibility to advance a different set of skills – herein lies a subset of different goals, as the player will have to choose which sets of skills that they want to pursue first at the expense of other skills. An example could be that the player wishes to develop his one-handed weapon skills in order to be better able to combat the enemies in the game. Focusing entirely on developing this one skill affects all other skills, but it is a choice that the

player will have to make in order to meet the challenges in the world of Skyrim.

This brings us to the choice of strategy in Skyrim. Being able to choose exactly how to develop an avatar in a virtual world entails the developing of various strategies on different levels. First, the player can devise strategies on the weapons and skills to use against specific enemies (e.g. blunt weapons are better at damaging heavily armoured enemies, while a bow and arrow can take out an enemy at a distance without the player having to expose his body to damage). Another aspect of strategy is how the player wishes to explore the world of Skyrim. Entering a dungeon sometimes require the player to stock up on helpful items such as potions (e.g. some potions fill up or enhance the three attributes in the game, thus enhancing the longevity of the avatar during combat. See Figure 31) or require more powerful weapons. Every aspect of roleplaying in Skyrim – whether it is by way of combat, dialogue or exploration – requires the player to test various strategies.

Figure 31: Tools for preparing a strategy

The third aspect of mastery is the subject of obstacles. Almost every quest that needs to be accomplished in Skyrim requires the player to overcome certain obstacles in the form of combat, dialogue and exploration. Fighting a powerful lich king in the wilderness is an obstacle that can only be overcome by improving your combat skills or skills of sneaking. Convincing an NPC to give you the items or information you want can be done by mastering skills of speechcraft, and finding the easiest route from a major city to a dragon temple can require the player to master the geography of the map, knowing the easiest way without encountering too many enemies.

The purpose of all of these player choices and their underlying mechanics is to provide a sense of mastery and thus triggering certain emotions within the player. Experiencing mastery in Skyrim can create a great deal of frustration. Meeting and fighting dragons can be a quite challenging and frustrating affair, but when you finally succeed

at killing a dragon there is an emotional reward in the form of fiero (triumph). And this is how the design of every aspect of combat is in Skyrim, and also how the skill system and level system is set up to facilitate: that the player is sufficiently challenged by the NPC's that he encounters.

6.3.2.2 Easy Fun

Next, we will look at Skyrim in terms of Easy Fun. The purpose of player choice here is to reward the player with opportunities for exercising their imagination.

The universe of Skyrim is built upon a vast database of lore and contains everything from knowledge on the rulers in the different regions of Skyrim to lore and history located in books scattered around the world pertaining to the whole universe of Tamriel in which Skyrim is situated. This allows for a good deal of iconic stories – not only in connection with the character that the player is in control of, but also the legends found in books and through quests to different dungeons in Skyrim. The most iconic story that Skyrim is built upon is that of the emergence of the Dragonborn (the player's character), a character with the ability to defeat dragons by using magical dragon shouts. The most important trait of iconic stories such as that of the Dragonborn, but also the stories connected to roleplaying a warrior or thief is the ability for the player to outlive a fantasy of doing something which is not possible in the real world.

Uncertainty and ambiguity can be argued to be a part of the premise for playing Skyrim. Engaging in combat can yield two results: either you win or you die. The interesting part of combat is that it is not always clear how the end result will come to be. An example of the uncertainty is how the player engages with the natural world of Skyrim: fighting a bandit in the wild can be interrupted by the player being attacked by a wild cave bear – resulting in a quick demise. Another good example of uncertainty in the combat situation is if the player engages in combat with a giant – getting hit by the giant's club would sometimes result in the player's avatar flying high above ground. This example is somewhat incorrect to use as the developers probably did not intend for this to happen. Identifying the ambiguity of playing Skyrim can be a bit more difficult, but it is hard to avoid the many encounters with NPC's in this world. Wherever the player chooses to go there are new things to explore and the joy of figuring out how the world works drives the curiosity of the player alongside the interesting things that can happen when things go wrong (e.g. when using the dragon shout that produces a force field and accidentally hitting your own follower in the process).

Mechanics providing player choices that are connected to creativity is what playing Skyrim is all about. It is a role-playing game and this

requires the player to use his creativity to build up a character and develop this character's abilities. As far as player-generated content go, it is possible for the player to build his own house in three of the holds in Skyrim, but the option to buy a house (for the small amount of 5000 gold) is also possible – afterwards it is possible to fill up the newfound home with various kinds of items – all to the player's liking. Being an RPG the player is fully in control of almost every aspect of the playing experience. The game features a large and nonlinear world and it is completely up to the player how to best approach it. This affords the player to create many player created experiences, as the whole game essentially facilitates adventure. Every encounter with an NPC is an experience that can be retold as a narrative.

In terms of detail, Skyrim contains a rich world for the player to explore: there are cities, dungeons, mountain passes, deep forests, inns, rocky caverns, abandoned fortresses and underground ruins; there are also a wide variety of items in the form of weapons, readable books, food and collectable ingredients for potions; there exists an elaborate character system containing over 100 different abilities and skills. In short, Skyrim is a game containing extraordinary detail allowing the player to satisfy any form of curiosity. Furthermore, the lay-out of Skyrim (rules of navigation and the geometric dimensions) coupled with the rules of interaction, resembles that of the real world. See Figure 32). In this way the player can sate his curiosity by exploring the limitations of Skyrim (what happens when you murder someone or steal forbidden items).

Figure 32: Rules of Skyrim

We find that Skyrim facilitates a great deal of Easy Fun in terms of all the elements of this play style: uncertainty, ambiguity, iconic story, creativity and detail. Looking back at the elements of uncertainty and ambiguity, it can be argued that there still exists a design philosophy of rewarding the player only with items, abilities and experience for completing quests that involve the possibility for the player to make one of two choices. An example of this is when the player

meets the Daedric Lord, Clavicus Vile, and is posed with the choice of either killing Clavicus' dog, Barbas, or convincing the lord that the dog should live: either choice yields a reward in form of an item. Nonetheless, the size of Skyrim affords the player to choose to experience the joy of figuring out what happens when interacting with the various NPC's in the game.

In general, Skyrim is a sandbox game in which it is up to the player to decide where to go and what to do. This does fuel the experience of free imagination and thus there is an emotional reward of curiosity that can result in wonder, awe and relief.

6.3.2.3 People Fun

The purpose of People Fun and the player choices within is to reward the player with opportunities for building relationships in and around the games that they play and to deliver emotional rewards in the form of generosity, gratitude and elevation.

Analysing Skyrim in terms of People Fun it can quickly be argued that People Fun is not the play style that the mechanics of Skyrim primarily affords in terms of the actual playing experience. What we mean here is that Skyrim is a single-player experience and as such the social interaction with other players is being performed as an activity around the game and not as part of the game mechanics themselves.

Looking at Player Interaction in Skyrim there is little to none. Unless, for example, that players decide to sit down together to cooperate or compete while taking turns at playing an avatar, there is no player interaction. As such the motivation for playing Skyrim is not to socialise with other players.

The same applies for the player choice of personalising ones settings in order to show it to others. Skyrim is not an online multiplayer experience, and as such there is not much showcasing of self-expression, profiles, friend lists or social tokens. The only apparent mechanic incorporated into Skyrim that could facilitate this is the achievements that players get for performing various missions and quests. These achievements are given as part of the player's profile on the system that he plays the game (e.g. playing Skyrim through Steam reveals Achievements on the player's profile page on that platform). As the purpose of this analysis is to identify and categorise the activity of playing the game and what play styles the game mechanics afford, this is not an element that weighs heavily on the analysis of the games.

Opposite to the two other common elements of People Fun, the third element, NPC interaction, is profound in the experience of playing Skyrim. As mentioned in section 6.3.1.3 interacting with the inhabit-

ants of Skyrim affords the player choice of either cooperating with or competing against both hostile and friendly NPC's. As much as Skyrim lacks in the context of personalisation and player interaction there is a great amount of NPC interaction to make up for it. Exercising NPC interaction can result in the experience of relationship.

Looking at Skyrim in terms of NPC interaction, the aspect of People Fun can make sense, and also how the emotional rewards such as generosity, gratitude and elevation appear. Even so, this is where the world of Skyrim has limitations. Experiencing the aforementioned emotions can only be tied to the NPC interaction as far as actual gameplay go, and as such it has nothing to do with building relationships with other players of the game.

6.3.2.4 Serious Fun

Finally, it is time to analyse Skyrim in terms of the Fun Key, Serious Fun. In Serious Fun the purpose of player choice is to reward players with opportunities to create and do something of perceived value.

In terms of stimulation, Skyrim contains many different elements that may allow the player to experience excitement. Taking advantage of the quest system the player can use the various quests and the work linked to them to achieve an experience of excitement. Conversely, choosing to pursue a quest where you must obtain a collection of items for an NPC can eventually lead to relaxation as you complete your goal, thereby feeling content. Other mechanics of stimulation can arise out of the visceral feedback that the player receives in Skyrim. Every time a skill is levelled up, audio-visual feedback pops up on the screen in the form of a progress-bar lighting up and a sound cue playing – which can be very pleasing feedback to the player.

Skyrim provides the player with amble of opportunity to do collection and achieve completion during quests, and this can help the player reach an experience of excitement or relaxation depending on the type of quest. In terms of relaxation and the mechanics of practice it is possible for the player to mine ore, smelt that ore to ingots and use these ingots to produce armour that can be either equipped or sold to a merchant. In this case, it may be the choice of the player to use this practice to both learn and do real work which can invoke the experience of personal values to the player. Since Skyrim is an RPG experience there are many times at which it is possible for the player to do real work that affects value (e.g. choosing to help out a lumberjack who has problems with cave bears destroying the lumber that she makes a living of – thus enhancing the player's values in helping other people).

Skyrim is a fantasy RPG, but that does not prevent it from delivering the experience of obtaining valuable items, skills or experience. This

experience is what can generate rewarding emotions in the form of excitement and relaxation. Whether a player is looking to avoid boredom or frustration, engaging in the different activities in Skyrim automatically alleviates these negative emotions by offering a quest-line system and a character system.

Mechanics of rhythm in Skyrim we find are represented by the patterns of play: exploration, dialogue and combat. Engaging in the activity of smithing or creating material for smithing can put the player in the rhythm of mining, collection and smithing which might work in conjunction with the player choice for "zen out". Just as performing the act of smithing can help the player "zen out", combat can do much the same for the player. Having the appropriate skill level to engage in combat with a horde of Draugr's (i.e. undead warriors of Skyrim) can work as a rhythm where the player feels the flow of combat, concentrating on defeating each and every one of them. As an endnote to the mechanics of rhythm, there is dialogue in Skyrim. Each NPC that can be interacted with often has a story to tell and the player can freely engage in the act of striking conversation with these NPC's. Walking around the city of Whiterun can provide the player with amble of opportunities to talk with different NPC's, hearing out what they have to say. This can also help the player to feel relaxation and relief as the patterns of dialogue is less filled with action than combat.

Having a lot of Serious Fun incorporated in a game makes the activity of playing feeling worthwhile. While Skyrim might not directly be a game that aims to enhance self-improvement (i.e. like a game of crossword might enhance your memory), it still provides opportunity for the player to experience enhancement of personal values. Being as elaborate an RPG as it is, Skyrim provides the player with the ability to immerse oneself in the patterns of combat, exploration and dialogue – each with the possibility to let the player feel excitement, relaxation, and an experience of learning or the experience of "zen out".

6.3.2.5 Summary

Following the analysis of Skyrim in the context of Nicole Lazarro's Four Fun Keys we will sum it all up with the table below.

Fun Keys	Mechanics	Examples
Hard Fun (Mastery)	1. Goals 2. Strategy 3. Obstacles	1. Quests; character advancement; skill development; upgrading equipment or abilities 2. Character creation; levelling skills, combat strategies 3. Enemy NPC's; locked doors and containers; foreign places not yet explored on the map; combat, exploration and dialogue
Easy Fun (Imagination)	1. Iconic story, uncertainty, ambiguity 2. Creativity 3. Detail	1. Character story; Main storyline; game world lore; combat (win or lose); exploration; NPC behaviour; quests 2. Roleplaying; character customization; item creation 3. Large game world to explore
People Fun (Relationships)	1. NPC interaction	1. Helping out NPC's, cooperating with followers, competing with hostile NPC's
Serious Fun (Values)	1. Stimulation 2. Practice 3. Rhythm	1. Quest completion; feedback from interface during combat and character development; collecting items 2. Enhancing skills and abilities 3. Patterns of play: exploration, dialogue and combat

Table 10: Fun Keys in Skyrim

6.3.3 Step 3: SDT

In this part of the analysis we will be looking at the previous parts of the analysis in the light of our knowledge on SDT. We will go through each of the basic psychological needs as previously described, and try to analyse whether the aspects of player fun and motivation holds true in regard to human motivation.

6.3.3.1 Competence and Skyrim

The analysis of Skyrim in regards to both Player Components and the Four Fun Keys has revealed elements that can be correlated to the need for competence.

In terms of Player Components, we have found that the game elements comparable to the subcomponents Advancement and Mechanics in Skyrim to be suitable for allowing the satisfaction of the need for competency. The first thing to notice about Skyrim is the genre of the game and the base playing experience it facilitates. It is a first-person roleplaying game (though you can switch between first-person and third-person view of your character) involving character development and quest completion. Skyrim lets the player create their own avatar and develop the skills and abilities of this character through exploration, combat and dialogue. The way for the player to experience the fulfilment of the need for competence is concretised through the feedback that the game provides the player via the HUD and journal. The point of all these seems to be to reward the player for his competency in playing the game. Furthermore, the mastering of skills and abilities in competition with the hostile NPC's allows for the player to measure up his skills and level of mastery of the game.

Analysing Skyrim through the lens of Hard Fun it is clear that it incorporates the mechanics for allowing player choice which in turn leads to mastery and the emotions associated with it. All the elements from Hard Fun can be found in Skyrim:

- Goals in the form of quest completion and character development
- Strategy in the process of character creation and approaches to combat with NPC's
- Obstacles in the form of the lay-out for the game, its many different levels (dungeons, cities, ruins, etc.), items and NPC's

All of these game elements denote the fun that can be had from mastery and thus correlates with the need for competence.

The play style Serious Fun can also be correlated with the need for competence. In terms of Stimulation and Practice the game contains

mechanics that can enhance the feel of mastery. This is done by stimulating the player with feedback from the HUD (see Figure 33) during and after combat, alongside visible feedback on character development. In terms of Practice, skills and abilities can be enhanced along the lines of learning how the in-game mechanics work (e.g. smithing, building, fighting, etc.). The aforementioned parts of the Fun Keys can work in correlation with each other to enhance the feel of mastery, as working towards values that afford self-improvement automatically improves the sense of mastery – as such Hard Fun and Serious Fun can be part of the need for competence.

Figure 33: The HUD feedback during combat in Skyrim

6.3.3.2 Autonomy and Skyrim

Achieving satisfaction of the need for autonomy in Skyrim can be compared to the player component Immersion. If autonomy means to work with a sense of personal volition, then having the choice to pursue your own path enhances the satisfaction of the need for autonomy. We have found that Immersion and all of the subcomponents of it can be found in the activity of playing Skyrim. Being a role-playing game, immersion is a big part of the game mechanics. In Skyrim it is possible to explore a whole world, develop a personal character and customise this character endlessly. Being immersed as such also affords the possibility to get lost in the universe of Skyrim, thus possibly escaping real life problems or experiencing relaxation.

Looking at the Fun Key, Easy Fun, it is the play style that comes closest to the satisfaction of the need for autonomy when playing Skyrim. The mechanics of creativity is a big part of Skyrim. Being able to create, customise and roleplay your own character as well as choosing which way to go and explore a game world that exhibits a great amount of detail is directly applicable to what we know as personal volition. As such, Skyrim is an enhancer of autonomy.

6.3.3.3 Relatedness and Skyrim

Feeling that you matter is an important part of being human and therefore the need for relatedness exists. Analysing Skyrim in terms of the social component yield only the possibility for NPC interaction, and therefore the player motivation for engaging in Skyrim on the premise for being social is, in this regard, minimal. Looking at Skyrim from the perspective of the Fun Key, People Fun, it is again only NPC interaction that matters. Skyrim features a great deal of NPC interaction and everything you do is facilitated by this. Without inhabitants, hostile or friendly, the world of Skyrim would be very dull. Therefore, it can be argued that the satisfaction of relatedness is represented through the player's interaction with NPC's. Helping out a group of warriors in the fight against a giant can yield positive responses from the group that the player might enjoy. Ultimately, many quests in Skyrim involve helping NPC's out in various ways, but this can fuel the player's outlook on their character and the feeling of being the one who really matters. Furthermore, the phrase, "you matter", is often a premise for engaging in a game. In Skyrim, you as the player are the Dragonborn, the only one who can save everyone from peril. As such, the satisfaction of relatedness in Skyrim can be said to take place. In a sense, this can be tied to the Fun Key of Easy Fun in which mechanics related to iconic stories can lead the player to desire figuring out the importance of his role in the end of the game.

6.3.3.4 Summary

Now that the third step has been completed we will sum it up by presenting the findings in Skyrim in the following table.

SDT	Player Components	Fun Keys
Competence	Achievement Mechanics Advancement	Goals, Strategy, Obstacles (Hard Fun) Stimulation, Practice (Serious Fun)
Autonomy	Immersion	Uncertainty, ambiguity, iconic story, creativity, detail (Easy Fun)
Relatedness	Social: NPC interaction Socialising Relationship Teamwork	NPC Interaction (People Fun) Iconic story (Easy Fun)

Table 11: SDT in Skyrim

6.3.4 Step 4: Extrinsic Motivation

In this step we will be analysing Skyrim in terms of extrinsic motivation and try to identify the various types of regulation that the game affords.

From the outlook, the driving force behind the motivation for playing a character in Skyrim is external regulation. Whenever there is a

quest to be done there usually is an external reward in the form of gold, experience, a magical item and so on. The rewards for engaging in any quest are mostly extrinsic. This is comparable to the Player Components of Achievement. Another example is the common combat activity of slaying dragons. This yields the reward of a dragon soul (can be spent on dragonshouts which the player can use in combat) and the loot that the dragon might carry along (e.g. gold, crafting material, random items from possible subjects that the dragon has devoured). Another aspect of external regulation is the achievements which are in-game awards given to the player for accomplishing milestones in the game (e.g. "The Way of the Voice" which is awarded for meeting up with the Greybeards and demonstrating your dragonshout abilities). Yet another external regulation is the regular loot that can be found on hostile NPC's which is determined by a variable ratio schedule (e.g. it varies from NPC to NPC how much gold they have on them). The last type of external regulation that we can identify in Skyrim comes from the audio-visual feedback one can achieve, and especially when levelling up an avatar (i.e. the player hears a chorus of male voices and a visually pleasing text appears on-screen). This belongs in the category of stimulation mechanic as we know it from Serious Fun in the Four Fun Keys.

Finding extrinsic motivation in the form of introjected regulation in Skyrim is a more difficult matter. Initially, it can be said that several of the quests given to the player can be introjected regulation. An example is when the player has the option to become thane in each hold of Skyrim (A thane is a protector of a hold and it is possible to become thane in each of the nine holds in Skyrim). Here, it is the job of the player to achieve the title by helping out the NPC's of the specific hold. The reward for doing this is the honorary title of thane (i.e. thus being in high esteem among the population) and a number of perks (e.g. a symbolic weapon and the possibility to avoid bounties of up to 1999 gold in the specific hold). The quest can be said to be introjected regulation in the sense that the player might pursue the title of thane on basis of self-endorsement, while the rewards gotten for becoming thane might be pure external regulation.

The last type of regulation that can be found in Skyrim is identified regulation. This regulation concerns consciously valuing of an activity and self-endorsement of goals. Since Skyrim is a roleplaying experience there are several factors that could signify extrinsic motivation. The first is the storylines incorporated in the quest system and in the game in general. The main quest concerning the Dragonborn can be said to be identified regulation as the player role-plays the hero and thus can identify with the values of this character. In general, role-playing can play a part in the self-endorsement of goals, as the player chooses to pursue paths that can lead to emotional or external rewards. Revealing the story behind the main character might be one

aspect, while the other could be just to discover new things about the universe. No matter the relation, this is spurred into action by the setting that the game has and thus the Player Component, Immersion, and the Fun Key, Easy fun, play a part in the game.

6.4 World of Tanks

World of Tanks (Wargaming.net, 2010) is a free to play, action simulation MMO where players drive tanks from the WWII, Korean War and Vietnamese War era.

The data collected from World of Tanks for the analysis can be found in the table below.

Game Definition Structure:	Computer Game: World of Tanks	Examples:
Goals	• Win battles • Unlock new modules and tanks • Purchase modules and tanks • Train crews	• Destroy enemies or capture their base • Unlock modules and tanks with experience points (XP) earned in battles • Purchase modules and tanks with credits earned in battles • Crews are automatically trained with XP from each battle • Crews can get speciality skills

Rules	• Team based play
	• Destroy enemy team
	• Capture enemy base
	• Three game modes:
	  o Standard Battle
	  o Encounter Battle
	  o Assault
	• Which can be played in four categories:
	  o Random Battles
	  o Team Training
	  o Tank Companies
	  o Clan Wars
	• Only one tank per player per battle
	• Physics simulates those of the real world
	• Five different tank types in tech trees
	  o Heavy tanks
	  o Medium tanks
	  o Light tanks
	  o Tank destroyers
	  o Self-propelled guns (SPG)/Artillery
	• Six different nations
	  o U.S.A.
	  o U.S.S.R.
	  o Germany
	  o Britain
	  o France
	  o China
	• Crews can be moved between tanks
	• Gold can be bought for real currency
	• Special equipment can enhance tanks' attributes
	• Different landscapes and surfaces
		• 15 players on each team
		• 15 minutes battle duration (10 minutes for Assault)
		• Standard battle: defend own base/cap enemy base/destroy enemy team
		• Encounter battle: cap same base as enemy team/destroy enemy team
		• Assault: one team defends a base which the enemy must take/destroy all enemies.
		• Random Battles: solo play or small platoons of up to 3 players
		• Team Training: training rooms where it is not possible to earn XP or credits but it does not cost credits to repair tank
		• Tank Companies: larger groups of players forming organized teams to battle other teams in the different game modes
		• Clan Wars: clans of players competing on a world map in the different game modes to win domination and money prizes
		• If a tank is destroyed in battle, a player can chose to quit the battle and take another tank into a new battle
		• Buildings and trees can be knocked down, cars and trucks can be crushed, tanks can fall from a height or drown in water
		• Different tanks need different tactics because of their attributes
		• The different nations each have their own historical tanks – both real and prototypes
		• If a player has a highly trained crew on one tank and unlocks the following tank in the tech tree, the crew can be moved and retrained for the new tank
		• Gold can be used to buy premium accounts (50% more XP and credits earning), premium tanks (improved credits earning), barrack space for crews, garage slots for tanks, premium consumables and ammunition types, crew training and retraining without penalty, dropping of crew skills without penalty, and permanent camouflage patterns for the tanks
		• Equipment can be bought for credits, but weighs a certain amount and can only be fitted if the total weight does not exceed that of the maximum carry capacity of the track on the tank
		• Some surfaces, like paved roads, are easier to traverse than others, like swampy lands

Feedback	• Visual • Audible	• Visual feedback: • Enemies/team mates left • Health left (self/enemies/team mates) • Broken modules • Injured crew • Locked tracks • Fire • Reload time • Number of shells left • Penetration chance • Smoke from barrel after shot • Amount of damage dealt • Audible feedback: • Shots when firing canon • Voice information on damaged modules/injured crew/penetrations/fire • Shots ricocheting off a tank • Shots penetrating • Engine sounds when moving
Quantifiable Outcome	• XP and credits • Repairs to damaged tank • Resupply of ammunition • Performance statistics • Medals	• The better you do, the more you earn • If tank is damaged or destroyed in battle, it gets repaired by spending credits • Ammunition is resupplied by spending credits • A player can view progress in battle performance • Medals can be won for certain acts in a battle
Voluntary Participation	• A player can choose to enter and leave a battle whenever he wishes.	• By exiting a battle before one's tank is destroyed, other players can file complaints for absence

Table 12: Data collection table for World of Tanks

6.4.1 Step 1: Player Components

We will start by looking at which Player Components correlates with the different aspects of the game.

6.4.1.1 Achievement

Starting from the top, we have Achievement with its subcomponents Advancement, Mechanics and Competition. As we can see in the data collection table, the game accommodates for all of these. Achievements can be earned in the form of medals for doing particularly well in battles or by completing certain missions, such as killing one of each tank in a nation's tech tree. Even the basic reward system of XP and credits from each battle can count as an achievement – the more XP and credits, the better the player performed.

In terms of Advancement, the game also has a lot to offer. One of the main goals of the game, to unlock and purchase new, more powerful modules and tanks, is advancement in itself. Furthermore, the goal of training the crew can also be seen as advancement on a smaller scale, as a higher trained crew can gain new skills to help the player advance faster by performing better, thus gaining more XP and credits in battles. Another aspect of advancement lies in the performance statistics. Players can track their win rate, battles played and other battle performances under the menu item *Service Record* both overall and for every individual tank currently or previously in the garage. This battle performance is also how players are measured when they apply for clans, which we will discuss further down.

Figure 34: A screenshot of the Service Record tab in World of Tanks

As mentioned in section 2.1.4, all games contain a set of mechanics. Therefore, it is easy to say that World of Tanks accommodates players interested in the Mechanics component. It can be said that WoT is

highly skill based, as the more of the mechanics one know; the better the chances are to do well in the game and advance faster. For instance, the different values of armour and penetrations of shells need to be learned in order to know where to shoot which tanks. If a player meets a tank without knowing how much armour it has or how much penetration the shell in his cannon has, it can be difficult to know exactly where to shoot to damage. Furthermore, the knowledge of these values can be used to try and protect oneself from damage from some relatively high penetrating guns by angling the armour of one's own tank. There are exceptions to this when the penetration greatly exceeds armour value. Another part of the mechanics is the different tanks' camouflage rating and view range. Tanks can remain hidden behind bushes and fallen trees at certain distances from enemy tanks. There are various types of tanks with different camouflage ratings. Different mechanics also govern how well a tank can traverse the surfaces in a landscape. This also governs how fast a player can reach a destination and engage enemy tanks.

The third subcomponent, Competition, is also well implemented in WoT. The main goal, to win battles, is competition at its core, and there are various ways to compete. The most common is Random Battles, where players can choose to enter battles on their own or with friends in platoons. Players can also join open Tank Companies or create their own and invite friends for a more organized experience. In Random Battles, teams usually have poor coordination because they often are comprised of 15 strangers with different ideas of how to win. In Tank Companies, players can experience how it is to be more organized as a team, all following the same tactics. Players serious about competition can also join clans. When a player is enlisted in a clan he can participate in Clan Wars, which takes place both in the game and on a world map. Clans can challenge each other and gain control of different provinces on the map. Each province yield a certain amount of gold for the clan, so there is an enticement to hold more provinces and dominate the world map. Single players can also challenge other individuals to a test of skills in a training room under Team Training without earning XP or credits. Another thing Team Training can be used for is electronic sports (or eSports), such as the Electronic Sports League (ESL[16]) where teams can compete against each other outside Clan Wars in organized events. Here players can compete to gain higher ranks on the ESL listings. Teams competing on the highest level can earn sponsorships and win money prizes in large scale tournaments.

6.4.1.2 Social

The second major component to be looking at is the Social component with its subcomponents Socializing, Relationship and Team-

[16] http://www.esl.eu/eu/

work. We anticipated that WoT would accommodate these components well by being an MMO, so now it is time to see if this holds true. At a first glance it does hold true, as there are many thousand players connected to the game at the same time with the possibility to chat in different chat channels, either with everybody online in a general chat, by searching for chat channels created by other players or by creating your own. As such, the basics for Socialising are present in the game. However, the chat channel menus are not standing out in the main interface (or garage) and thus not easy to find if you are not directly looking for it (see Figure 37). It is also possible to create chat channels with individual persons by right-clicking their names and choose the option in the drop-down menu. Furthermore, the in-game chat allows for players to socialise while engaged in battle. It is possible to send messages to everybody in a battle, be it your own team, the enemy team or your own platoon when that is applicable. These social places are ideal for casual chat, making friends, or helping others. When players get frustrated with their team mates or opposing players, it is possible that unfriendly chat can occur. If players team up with other players in a platoon, a special channel can be used to chat with just the players in the platoon. This can be strangers found in a chat channel, where possible relationships can enfold, or existing friends.

Figure 35: The different socializing enablers

Players can also find Relationships through clans, which are perhaps more personal. Most clans have requirements which players need to meet in order to be accepted. Often this is a certain amount of battles played, tanks of a certain tier or a certain win rate. Some requirements are high, others low. This means that some players, often players very new to the game, will have a hard time finding a clan who will accept them. Usually clan members get along well and support

can be found or given between players of the clan. It is also not unusual for clan members to meet in real life and socialise outside the game, but we will not concentrate on these events in this analysis. Once a player is part of a clan, the chat for that clan will appear in the main interface. Another way to keep track of relationships is to add players to a contact list. That way it is possible to keep track of friends outside the clan as well.

The final subcomponent of the Social component, Teamwork, can be said to be well accounted for in WoT. In every battle, players are almost forced to work together as a team to win. It can happen that individual players can carry a whole team through to a victory, but it happens rarely. Teamwork is more predominant in Tank Companies and Clan Wars, where coherent and organized teamwork often means the difference between victory and defeat. Furthermore, the provinces held on the world map in Clan Wars as well as the rating on the listings in eSport can be seen as group achievements.

6.4.1.3 Immersion

The final component, Immersion, and its subcomponents Discovery, Role-Playing, Customization and Escapism are also implemented, though not as deeply as the other components and subcomponents. In terms of immersion itself, the different sound effects and visuals, such as detailed tank models and realistic looking game world, help set the mood for a tank battle, even though some elements might be lacking (such as realistic engine sounds and sounds). The historical tanks also help maintain the feeling of being in the era. If you are familiar with the era, some elements might throw off the immersion, such as tanks that did not meet on the battlefields in real life can battle against each other in the game. The fact that battles have a set duration can break the immersion as players are pulled back to the garage once the battle is over.

Elements of the subcomponent Discovery can be found in the game, such as exploration and finding hidden things. The maps can be explored by players during battles or in Team Training. Sessions can be created dedicated to get to know the different maps and hidden locations can be discovered. Furthermore, sessions in Team Training can involve the exploration of weak spots in tanks' armour. There is nothing in the sense of lore to discover other than reading a few historical facts about the different tanks via the Tech Tree. The Tech Tree can be explored in itself, as players can discover new tanks and explore their characteristics.

WoT can be said to accommodate Role-Playing, if we look at it from the perspective of taking on the role of a tank commander for the duration of a battle. The tanks have a certain character history as well in that they "evolve" up through the tech tree to become more powerful

tanks, so to say. The crew members also play a part in this, as they can follow a line of tanks up through the tech tree, evolving with their own skills and perks as they get trained. There are no great story lines or fantasy elements so the Role-Playing component can be said to be less implemented according to Yee's definition.

In regards to Customization, it is possible to change the appearance of one's tank by adding a camouflage pattern, insignias our emblems, and it is possible to add accessories in the form of equipment, which can have different attributes to help players in battles. This is where the list ends for in-game customization, however, unless you start implementing modifications created by the player community.

WoT allows for Escapism in the form of letting players, who might not feel adequate in real life, be a successful tank commander wreaking havoc on the battle fields. Players can escape into a world where there are no real world problems. It is possible to go into battle after battle in a form of flow state to escape from real life, but the very nature of the time limit can draw people out in to the real world when the play session ends. As such, we find the possibility to avoid real life problems very player dependant.

6.4.1.4 Summary

To sum up our findings during the first step of the analysis, we will collect them in a table, which can be seen below.

Player Components	Mechanics
1. Achievement 2. Advancement 3. Mechanics 4. Competition	1. Reward system of XP, credits and medals 2. Unlocking new modules and tanks, training crews, player stats 3. Tank stats, camouflage ratings 4. Random Battles, Tank Companies, Clan Wars, eSports
1. Social 2. Socialising 3. Relationship 4. Teamwork	1. It is an MMO 2. Chat channels in and out of battles 3. Clans, adding players as friends 4. Team based battles, Tank Companies, Clan Wars
1. Immersion 2. Discovery 3. Role-Playing 4. Customization 5. Escapism	1. Sound effects, tank models, game world 2. Maps, Tech Tree 3. Commanding tanks 4. Camouflage patterns, insignias, emblems 5. Player dependant

Table 13: Player Components in WoT

6.4.2 Step 2: The Four Fun Keys

In this step we will analyse the data for WoT in the light of Lazzaro's Four Fun Keys.

6.4.2.1 Hard Fun

Looking at Hard Fun, we need to identify which aspects of WoT support the player choices to overcome obstacles, create/test strategies and challenge/progress goals, in order to analyse how the game can create the feelings of mastery and fiero. In each battle, the enemy team as a whole and each individual tank can be seen as an obstacle that needs to be overcome in order to win. The research price in XP and cost of credits for each new module and tank can also be seen as obstacles needed to be overcome in order to progress up through the different tech trees.

When it comes to creating and testing strategies, WoT accommodates this very well for players partial to that sort of play style. There are no in-game features to help create a strategy – players must do this on their own. Players who wish to progress in skills need to think about strategies and either come up with their own or borrow from others, as having a strategy can help players learn how to react to different situations during a battle. It is easy to test strategies in battles, as the result of decisions are direct; either it works and you win the engagement, or it does not work and you lose the engagement.

The challenge and progression of goals in WoT is almost a core element to the game. The goal of progressing up through a branch of tanks on the tech tree is a very good example of this. Furthermore, it is quite a challenge to reach the top tier in a branch. Other goals to challenge yourself with and progress towards can be to become a better player where learning the mechanics of the game and creating new strategies is almost mandatory, or to train a crew to have all the desired skills for a specific tank.

Having strategies to follow, as well as creating new ones, along with seeing our progression in the goal to acquire a top tier tank, and overcoming the obstacle of opposing players in battles gives us the sense of mastery. The feeling of losing battles over and over again can be frustrating, but learning to use strategies correctly and to control your tank efficiently can result in victories and ultimately fiero. After winning a very difficult battle, a sense of relief can be experienced, until you roll out into the next battle. Each state of emotion can last a short or a long time.

6.4.2.2 Easy Fun

Entering a battle, there is always a certain amount of uncertainty as to how players are going to act. Depending on how players react, inter-

esting failure states can occur, where e.g. a sure victory ends in defeat or vice versa, and you try to figure out just how it happened. Uncertainty can also connect to small instances during a battle where decisions sometimes have to be made on the fly, such as how you will be reaching a specific spot on the map without getting spotted or flanking an opponent successfully, entailing a joy of figuring it out, as it might just mean the difference between victory and defeat.

Looking at ambiguous elements in the game, it is difficult to find many, as the game is very strictly bound to the rule set and mechanics and very often things happen as one would expect i.e. the in-game gravity will always keep the tanks on the ground or pull them towards the ground in the event of a drop from a height. The only ambiguous moments we noticed is in the mechanics of penetration characteristics, where a certain amount of fluctuation in the penetration values between each shot, means that some shots might bounce where others penetrated.

The game is built around the iconic story of World War II, implementing the tanks from that era as well as some tanks from the 1950's and 1960's. Players can get their curiosity of how it would be to drive a tank from that time satisfied. In the game, there are no game modes based on the actual stories of tank battles from that time. The only stories in the game are the ones of our endeavours on the battlefields, which we tell to others.

In terms of creativity, we have mentioned that players can role-play as tank commanders, using a bit of imagination.

Players can choose to implement content from others or to create their own. These modifications can be either visual, functional or a mixture of the two. Examples can be new skins for tanks, more on-screen information during battles, or a visual change of different parts of the interface (see Figure 36). Player-generated experiences can be found in the form of community-held historical battles, where players on forums get together and recreate historical battles from World War II. These battles take place in the training rooms of Team Training over a number of different maps, using only historically correct collections of tanks, which participated in that particular historical battle in real life.

Figure 36: Examples of WoT's battle interface without and with mods

In terms of detail, the sheer amount of numbers (armour value, penetration, camouflage rating etc.) in WoT along with a collection of 35 maps, as of the current version of the game, holds a lot of details for players to explore. As mentioned, every tank has a set of modules to equip with different characteristics, giving many different variations of the same tank depending on how it is set up. The possibility to add extra equipment to the list further expands the variations of each tank. Every map in the game can also be explored to find good positions to place your tank under different circumstances.

On the whole, WoT can accommodate for some imagination and curiosity within players through the uncertainty of battles and ambiguity of game mechanics, along with player-generated content and experiences, as well as the exploration of different detail in the game. Other ways curiosity can be satisfied can be to jump into Team Training with a few other like-minded players, to just experiment with different tanks and their behaviour, race around a map or jumping off from high places just to see what will happen. These are things we have done ourselves, when we wanted to fool around instead of having to perform in battles, which is a common trait for Easy Fun. Another thing we noticed with players in battles was that once a battle is a definite win, some players on the winning team start playing around with driving into each other, shooting each other or jumping off ledges. This can be said to be one of the traits of curiosi-

ty. We also experienced the cycle of feelings going from curiosity, with a thought of 'what if…?', to the surprise of finding out what the result is along with either wonder or awe depending on the result, to a satisfactory relief of having found out, back to a curiosity of trying out a new thing.

6.4.2.3 People Fun

WoT allows for a lot of player interaction purely based on it being an MMO. Every battle is a player interaction where communication, cooperation, performance and competition are large parts of this interaction. Mentoring and leading can also be found as a player choice in the game. As mentioned earlier, WoT has an in-game chat function for communicating during battles, but for people not able to write or read the languages spoken in chat (there is a large variety of European languages with English being seen as the standard), the game has a set of often used commands and messages that can be given by pressing different keys during battle (i.e. "Help!", "Attack!" and "Defend the base!"). Outside of battles there are also the different chat channels mentioned earlier, where people can communicate with other players, both strangers in the general channel and friends in clan channels and friends from a friend list, which we will elaborate on later in this step. It is also possible to start private conversations with individual players. This way, there are many different channels to communicate in, although it mostly is done in text.

Cooperation is a large part of winning a battle, as mentioned before, and the different ways WoT allows for cooperative play, both in Random Battles, Tank Companies, platoons and Clan Wars, can be said to support cooperative play styles. Even when cooperating, teams need certain players to perform in order to achieve the best outcome. Heavy tanks will need to take a lot of abuse and attention and hold flanks, so that mediums and light tanks can flank around the enemy to support the heavy tanks. By performing the best one can in the role of the tank chosen for the battle, a player can help immensely with the outcome. Of the different player interactions, competition must be said to be the most important player interaction, as that is the whole premise of a battle. A battle can be played without communication, cooperation and players performing, but it cannot enfold without competition.

When it comes to mentoring and leading, the ability to mark sections on the map along with the text chat enables players to enjoy this undertaking. It can be difficult for players to mentor others while they are still alive themselves, as it takes time to communicate elaborate tactics or strategies in writing. Outside Random Battles, and especially in Tank Companies and Clan Wars, it is possible for players to lead an entire team to victory. Team Training can be used to train

leading and mentoring in an environment without the stress of having to perform well to win.

In terms of personalization, players can paint their tank with a camouflage pattern and add insignias and emblems. There is also not much to support self-expression. There really only is the five different tank classes with which one can express themselves to a certain degree; people who wish to brawl and 'stomp' through battles can choose heavy tanks to express themselves, while people who like to lay back and just destroy people from afar can choose tank destroyers or artillery. There is one friend list implemented in the game called 'Contacts', where one can add players to a list of friends, see the players in the clan if so applicable, see players currently being ignored and players for whom one has deactivated voice chat. It is also possible to search for other players by entering their in-game name. It is not possible to create different friend lists for different types of friends, so personalizing in this regard is not possible.

Figure 37: Screen shot of the Contacts menu in World of Tanks

When a player is in a clan, each of their tanks receives the clan logo easily visible for other players as well as an extension to their in-game name with the abbreviation of the clan. These are the only social tokens we have identified in the game.

There are no NPCs in WoT, so interaction with these is non-existing.

Even though WoT has a shortcoming of features supporting people fun, relationships can still be formed within the game through the features available. The experience of generosity, gratitude and elevation (the emotions connected to People Fun) might be found in a battle due to the nature of the game modes and communication mechan-

ics. Help from team mates can be seen as a generosity to which gratitude can result in elevation with the team mates in question.

6.4.2.4 Serious Fun

In terms of stimulation, there are the XP and credit income from each battle. WoT has also implemented a wide range of medals that players can earn by performing different tasks though a battle or by unlocking all tanks in a nation's tech tree. There are also medals with different classes i.e. a specific amount of damage dealt in total in four steps. All of these medals cater for players who enjoy collecting and/or showing off badges of honour. Other ways of seeing stimulation is for players to collect tanks, for example to collect all of a certain type of tank in the game.

The old proverb: practice makes perfect holds true with this game. Practicing different tactics or strategies makes it easier to learn new ones for example, and might help improve the learning of tactics or strategies in other contexts. There is not much in the ways of bodily improvement when playing WoT, as it is not a physically demanding game. The game can also be used as a sort of strategic simulator for the armoured divisions in the army since the game has realistic game mechanics and physics.

In terms of rhythm in the game, the short durations of battles means that as a player goes from battle to battle easily can enter a rhythm of sorts. There is a certain evolution of emotions before reaching the relaxing state of rhythm. Each day, there is a daily XP bonus for the first victory of the day, which might make players strive to perform their best to maximize the gain from that bonus. Having to take on this task can be boring or even frustrating. Depending on a player's luck on the day, it might be a frustrating endeavour with many losses before the bonus is gained, or players might go from victory to victory and enter a Zen-like focus. After the bonuses have been collected, players have the possibility to relax properly while playing.

6.4.2.5 Summary

Now it is time to summarise which of Lazzaro's mechanics and player choices we have identified in WoT and implementing them in the table below.

Fun Keys	Mechanics	Examples
Hard Fun	1. Obstacles 2. Strategy 3. Goals	1. Enemy team, individual players 2. Good strategies help win battles 3. Unlock new modules and tanks, become a better player, train crews
Easy Fun	1. Uncertainty 2. Ambiguity 3. Iconic Story 4. Creativity 5. Detail	1. Actions of other players 2. Penetration values 3. World War II 4. Implement mods, partake in historical battles 5. Numbers, maps, different tank setups
People Fun	1. Player interaction 2. Personalize	1. It is an MMO, chat channels, player commands, team based battles, Tank Companies, Clan Wars, clans, players leading and mentoring 2. Camouflage patterns, insignias, emblems, managing contacts, clan logo on tanks
Serious Fun	1. Stimulation 2. Practice 3. Rhythm	1. XP, credits and medals 2. Help with strategic thinking, practicing real world strategies 3. Entering battle after battle

Table 14: Fun Keys in WoT

6.4.3 Step 3: SDT

Having analysed the game's attributes in terms of both Player Components and Fun Keys, it is time to compare our findings to SDT.

6.4.3.1 Competence

Having analysed WoT we have found clear elements, both in Player Components and the Fun Keys, which allows for players to satisfy their desire to grow abilities and achieve mastery of new situations and challenges. Looking at game elements satisfying this desire in relation to Player Components, we find the ones listed in the subcomponents of Achievement; Advancement, Mechanics and Competition very suitable. Players can grow their abilities to control tanks, as they advance up through the tech trees, gaining mastery over new tanks they unlock, as each tank has a slight difference to other tanks in terms of how it is best played. Furthermore, players who master the challenge of applying their knowledge of the game's mechanics can become better players and grow their ability to perform in the battles. Finally, players can master the challenges of the battlefields, learning how to adapt to different situations as they unfold. The elements in the component of Achievement can also be viewed as related to competence as an indicator of how one's abilities are growing in the way of the amount of XP and credits received and the medals earned.

In relation to the Four Fun Keys, Hard Fun and Serious Fun both have elements satisfying the innate desire of competence. In Hard Fun the challenge and progression of the goal of unlocking new modules and tanks is very similar to the subcomponent Advancement above. Therefore, we have determined that they fulfil the same requirements for satisfying the innate desire to grow abilities and master new challenges and situations. The importance of creating and testing strategies in WoT also caters very well for the desire of mastering new challenges and situations, as strategies constantly evolve and change as new tanks are unlocked. Overcoming the obstacle of other players in battles can also be seen as the mastery of a new challenge for each battle, as they all differ from each other due to the fact that 30 individuals have their own idea of how to best do things.

When practicing real world strategies in the game and learning new strategies, which is part of Serious Fun, players can also grow their abilities to execute these strategies and learn to master them. The stimulation aspect can be seen in the same way as Achievements above; being an indicator of how well abilities are growing.

6.4.3.2 Autonomy

We see autonomy as a very broad term, as personal volition in terms of WoT covers everything from deciding to start the game, to what

type of tank to play with, where to go on the map and for how long to play. In WoT, we see the Player Components and Fun Keys most in line with the desire to take action out of personal volition as the subcomponents of Immersion; Discovery, Role-Playing, Customization and Escapism as well as the Fun Key Easy Fun. Discovery is a very autonomous activity in WoT, as players decide if they wish to explore maps and if so, where they want to explore and how (in battles or in Team Training). Players can also choose to explore the tech tree to discover new tanks and their characteristics. Role-Playing can be said to be a very autonomous undertaking, as many aspects of a character can be decided by the player to form an avatar specific to that person's preferences. In WoT there is not much in the way of this, but the little that there is does allow for autonomous behaviour. Players can also choose how their tanks appear with a selection of different camouflage patterns, insignias and emblems, which supports autonomy as well. Some players might be able to use the game as a means to escape the problems of the real world. The decision to do this can be seen as autonomous as well as a decision made based on extrinsic influences – more about this later. In terms of Immersion itself, there is not much in the ways of elements in WoT which directly enables personal volition as such. The visuals and sound effects might more be seen as external motivators to play the game, which we will touch upon later.

Looking at Easy Fun, it is very imagination driven. This is also what creates the uncertainty of player actions described in the analysis of WoT. This uncertainty is very autonomy related, as each player decides where to go on the map and how to play during the battle according to how they use their imagination. The creativity aspect of the game (implementing mods and partaking in historical battles) is also very autonomy dependant. Details and the exploration hereof correlate very well with the Discovery subcomponent above.

6.4.3.3 Relatedness

In WoT the need to have meaningful connections to others can be identified in the component of Social and its subcomponents Socialising, Relationship and Teamwork, as well as the subcomponent Competition of the component Achievement. Players can find individuals through the game with whom they can create meaningful connections as well as finding entire groups of people in the form of clans or Tank Companies to connect with meaningfully. Furthermore, the game is set up in such a way that every team depends on the individuals of the team; players can get a feeling of mattering to the other people in the team, especially in Tank Companies and Clan Wars than Random Battles. In terms of Competition, players can get a meaningful connection to players of the opposing team as they

meet in a challenge to see who is best. Here we find the connection to be one of rivalry.

In the Fun Key, People Fun, the player interaction mechanics of communication, cooperation, mentoring and leading found in WoT also allow for meaningful connections with others.

6.4.3.4 Summary

The results of this third step can be summed up and presented with the table below:

SDT	Player Components	Fun Keys
Competence	Achievement Mechanics Advancement Competition	Goals, Strategy, Obstacles (Hard Fun) Stimulation, Practice (Serious Fun)
Autonomy	Immersion Discovery Role-Playing Customization Escapism	Uncertainty, ambiguity, iconic story, creativity, detail (Easy Fun)
Relatedness	Social Socialising Relationship Teamwork	Player interaction, Personalize (People Fun)

Table 15: SDT in WoT

6.4.4 Step 4: Extrinsic Motivation

Now to the final step in the analysis: identifying the different extrinsic motivators in and around WoT. Starting with external regulations, the most obvious one is the reward system of XP and credits, which awards players for playing the game. This is positive reinforcement. In terms of Player Components, this is Achievement and in terms of Fun Keys, this lies under Serious Fun with the stimulation mechanic. The reward system only rewards players, dependant on how well they do in battles. As such there are no schedules to when the reward comes. WoT does implement scheduled positive reinforcement in the form of daily XP bonuses for the first victory of the day in each tank in the garage. As mentioned earlier, it can be a frustrating experience to make the most of the bonuses. If you are performing well personally, but the team does not as a whole and you lose, it can be frustrating. The same applies for doing a bad performance when the team wins (resulting in a lower amount of XP and credits as opposed to performing well). It can also be stressful to have to perform at one's best for many battles in a row. In addition to the daily bonuses midweek medal hunts, where players can strive to collect a certain medal for extra rewards in the course of a day, are implemented. They also incorporate weekend specials and other specials in connection with events such as holidays or days of historical importance in relation to World War II. During these specials a lot of bonuses, medal hunts,

missions with rewards for completion, and offers are in effect. This can have an influence on people's decision to play the game.

Another aspect to external regulation can be seen in the case of Escapism, the subcomponent of Immersion. Players might play the game to avoid problems in real life. These problems can be seen as negative reinforcement, where players use the game to escape them.

The next we wish to touch upon is introjected regulation. This covers extrinsic motivators which strengthens one's ego – approval from one self or others. In WoT this can be seen as the wish to perform well in order for the players in your team to approve of you. Positive reinforcement can be comments complimenting your performance while negative reinforcement in the case of bad performance can be comments about the poor play you deliver. Trying to perform the best one can, can be seen as active avoidance of the negative comments. This applies for both Random Battles, Tank Companies and especially Clan Wars and eSports where substantial rewards are at stake. Another aspect of introjected regulation can be seen in the form of player statistics. A player can strive to improve his statistics in order to approve of himself or get approval from others. A way to showcase one's own performance is through medals in WoT as players can view each other's battle statistics in-game.

Identified regulation is the next form of extrinsic motivation we will look at. It covers extrinsic motivators which are identified as personally valuable. In WoT this can be the grind up through the different tech trees, where the extrinsic motivation of unlocking new tanks is identified as valuable because of the time invested in doing so. Another example is the way one of the authors of this thesis got into WoT. Having heard recommendations about the game and being encouraged by friends who already played it, he began playing himself and ended up deeming the game valuable to him.

6.5 Summary of Analysis

Through the analysis we have uncovered the elements of two different games and their relation player motivation theories as well as human motivation theory. The two computer games have proved to contain many mechanics that can facilitate the satisfaction of psychological needs and various player choices, depending on the play style and emotions that players seek. We have identified several reoccurring Fun Keys within both games, but each game had different levels of emphasis on each key – showing that the two games are different in their offerings. The same applies for the Player Component theory.

This concludes the analysis and we will use the knowledge from the analysis to build on the existing theoretical framework, which will be done in the following section.

7 Final Thoughts

The following section is the third and final part of the thesis. The purpose of this part is the discussion of the theoretical fields presented in the first part compared to the analysis and the findings in the second part of the thesis. Furthermore, in this part we will discuss the underlying theoretical framework for looking at fun, player motivation and human motivation – all in the context of computer games. It is our intention to attempt to tie up any loose ends in connection with the theoretical fields we have presented and how we understand their relevance to the problem area of the thesis. Finally, we will sum up this section with a conclusion in which the problem statement will be reviewed and afterwards we will put the thesis into perspective.

7.1 Discussion

We want to clarify that we approached the thesis with a certain understanding of how fun can be had in computer games. Through our prior experience with computer game design the important factor for understanding fun came in the form of knowledge on gameplay as this is considered to be fundamental to games and their formal structure. By creating goals, rules and feedback – while ensuring voluntary participation – a game could be said to have an inherent capability for being fun. We coupled this with the theories of Salen & Zimmerman in order to define the premise of computer games and thus the premise for computer games to be fun. Also, we had an understanding that the activity of playing could be regarded as fun through the perspective of flow theory. Furthermore, we introduced the aspects of Web 2.0 as we identified elements of autonomous motivation as expressed through user-generated content on the internet.

We will start by looking at the theories used as foundation for the analysis and discuss their relevance in the context of both existing computer games in general, and the computer games we used for the analysis.

The most fundamental theory we found relevant for investigating human motivation was self-determination theory. The interesting aspect of this approach is the fact that it assumes human beings to actively satisfy the innate, psychological needs for competence, autonomy and relatedness. The reason that we find this relevant is in part due to our preunderstanding with which we approached this thesis: the field of phemenology and the need for humans to act in this world. The scientific theory of phemenology informs us that people want to act in order to master the activities in their everyday, but also in order to make meaning of the world that they live in. This correlates to the assumption that in SDT, human beings are driven towards the satisfaction of psychological needs and that they are actively seeking to improve their well-being by doing this. Using SDT as

foundation for the motivation for playing games is part of finding the fun in computer games and we view the three psychological needs as present in computer games to a certain extend. While we view SDT as being fundamental to motivation in computer games we also think that the three needs represent fields of motivation that can intersect when people are motivated to do the activity of playing. Thus we find it relevant to visualize SDT as in the figure below.

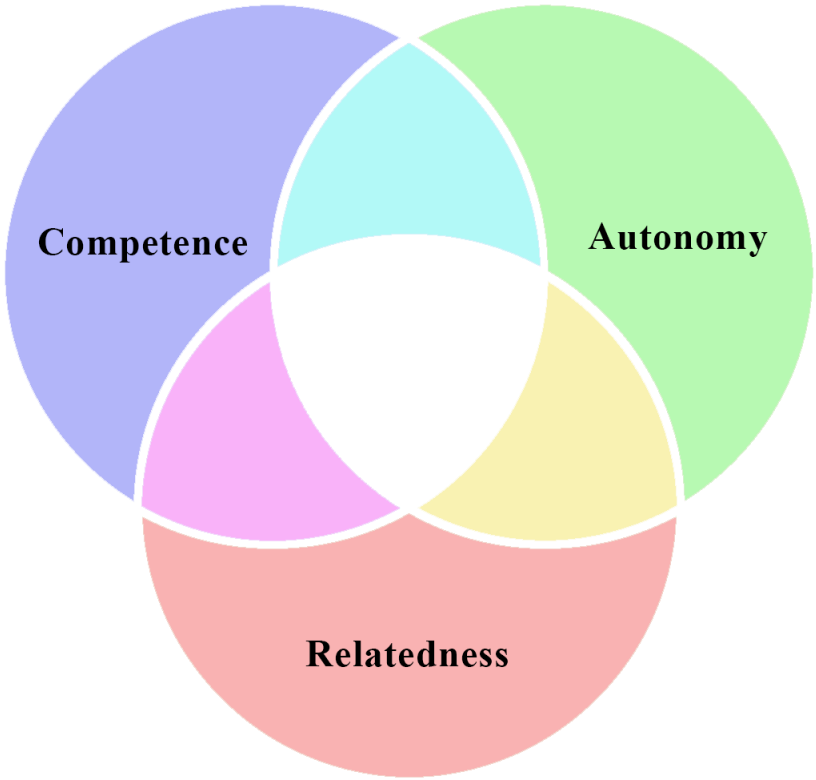

Figure 38: The three psychological needs as fundament for understanding human motivation in computer games.

The illustration above shows how the different psychological needs can be presented and compared to each other. An important aspect is that since SDT concerns the innate psychological needs for well-being we automatically view the needs as intrinsic motivation (i.e. the motivation for doing an activity out of sheer interest and enjoyment in order to experience inherent satisfaction). Furthermore, the different tension fields have not been denoted to contain any elements as of yet, but they signify the overlapping of the needs. Further into the discussion we will be taking extrinsic motivation into account as well.

The next piece of insight we gained came in terms of player motivation as presented by Nick Yee's model of Player Components. Opposite Richard Bartle's player type theory, the theory on player components was derived from empirical observation of in-game player behaviour in MMORPG's and that the Player Components can be interrelated – meaning that people can seek one or more Player Compo-

nent at the same time. We found this aspect of player type theory interesting as the Player Components can be used to identify the game elements in a computer game that can be directly applied to player motivation or in other words why people would pick up a computer game. Even though this holds true, there is a dilemma in using Nick Yee's Player Components because of their origin in MMORPG's. Nonetheless, we find the theory relevant to why people would pick up a computer game as the identification of the various components offers insight into those mechanics that can be used in game design for motivation and enhancement of fun.

The third insight we gained on motivation in computer games came from Nicole Lazarro's Four Fun Keys. The approach of this theory was observations of the emotions exhibited in connection with the activity of playing. Each Fun Key represents a certain play style for achieving emotional rewards and as such the fun relies heavily on the game design for computer games to allow for player choice that leads to these emotional rewards. Seeing as the Four Fun Keys is empirically derived from the observation of players' emotions we found the theoretical field important to our understanding of fun and how it can be connected to human motivation.

In order to assess whether the abovementioned theories could be mapped out and compared we performed a four step analysis of two computer games. As we suggested in the beginning of the analysis we would have wanted to analyse more games in order to be able to cover every field of SDT, but we have found that many elements of World of Tanks and Skyrim overlap in terms of game mechanics and the psychological and emotional rewards that they provide – be they either extrinsic or intrinsic of nature.

The results of the analysis have led us to visualise the findings in the following figures. The theories of Player Components and Four Fun Keys will be placed inside the framework we presented above and discussed accordingly.

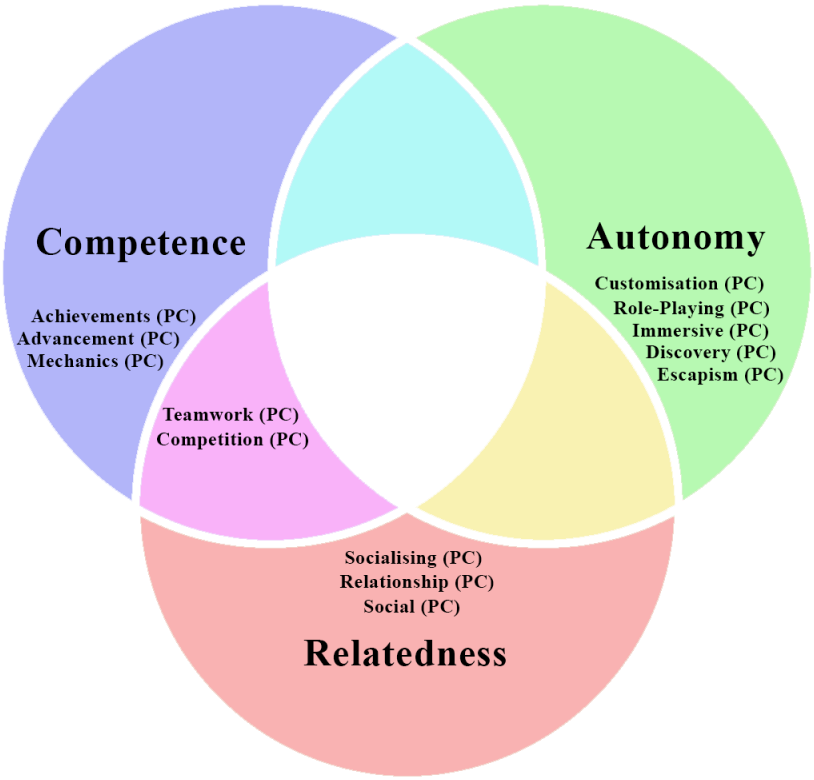

Figure 39: The motivation framework including Player Components (PC)

This way of looking at SDT shows that the Player Components are confined within each field according to the nature of the theoretical approach of Player Components (i.e. the components tell specifically what behaviour a player seeks within a game and this motivates play). An element such as roleplaying could be part of the other two domains according to the context of the game. One aspect of roleplaying is to interact with others in context of the role undertaken (e.g. healing NPCs or other players if you are playing the Healer class in World of Warcraft). Another aspect is to socially interact as the role chosen (e.g. taking conversation choices best suited to the role of your character when interacting with NPCs or chatting with other players). However, in the light of the analysis we found it most suitable to place it in the field of autonomy. The reason for this is that through our analysis of Skyrim, which is a single-player role-playing game, we found that the act of role-playing in itself does not include any social connections but that it relates solely to a set of choices regarding the creation and evolution of the player's character. We also placed teamwork and competition in the tension field between competence and relatedness due to their ability to enable both mastery and social interaction (i.e. competing against others or cooperating demands a certain amount of skill as well as interaction between players).

In Figure 40, the Four Fun Keys has been placed in relation to SDT.

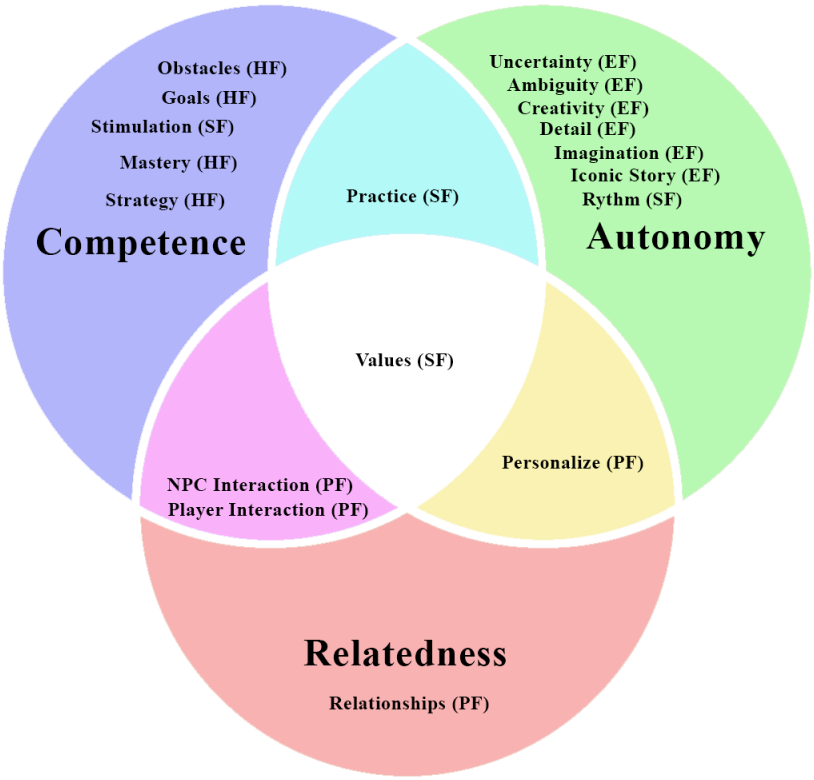

Figure 40: The motivation framework including the Four Fun Keys (HF = Hard Fun, EF = Easy Fun, PF = People Fun, SF = Serious Fun)

Seeing SDT in the light of the Four Fun Keys we found that some aspects of the Four Fun Keys lie in the tension fields of the model. We found that all the elements of Hard Fun fits to competence, while all the elements of Easy Fun fits to Autonomy. It is with People Fun and Serious Fun we find the elements in the tension fields. Player and NPC interaction both lie in the tension field between competence and relatedness, as they both cover a mixture of motivations related to the two. As with competition and teamwork from Player Components, player and NPC interaction both require social interaction and the use of game skills. The element of personalize from People Fun is placed between relatedness and autonomy, as it covers the choices of how to manage friends and appear to others – both social and autonomous motivations. In Serious Fun we found that the element of practice lies in the tension field between competence and autonomy, as the motivation to practice can be both competence and autonomous related. An example could be to choose to practice strategies in WoT because it might be personally valuable or because of a desire to become better at executing them. We find the element of values appertaining Serious Fun to encompass all three motivations of SDT. This is because different individuals have different perceived values. While some people might find it valuable to excel at something, others wish to find a meaningful relationship with other people or just feel in control of their own life. We have placed stimulation in competence,

due to the feeling of excitement by being stimulated by progression, and a good example of this is the level up feedback in Skyrim.

Now we can place all the elements in the motivation framework as presented in Figure 41.

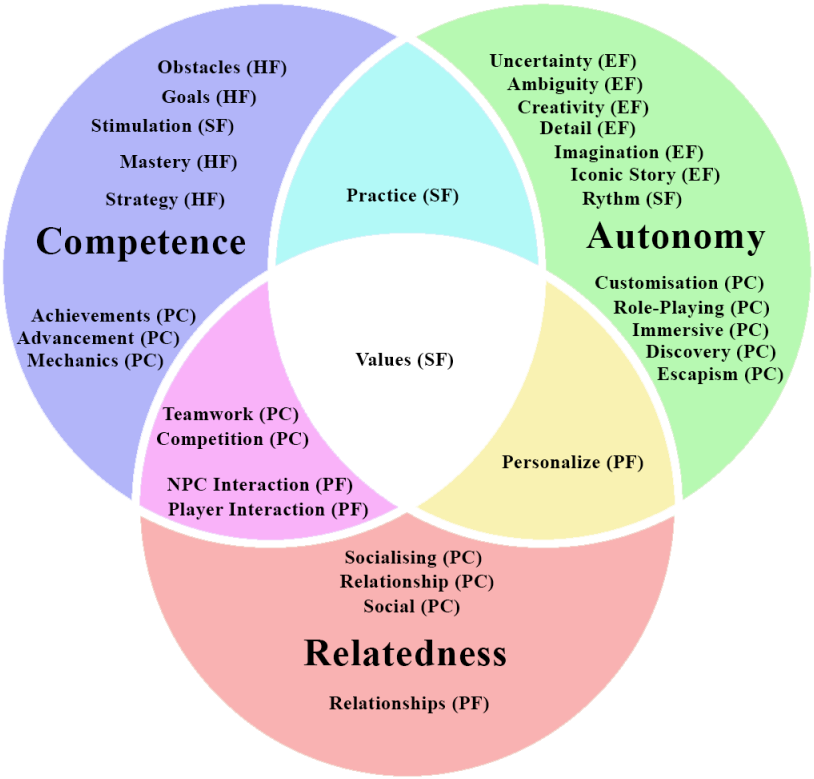

Figure 41: The motivation framework including both Player Components and the Four Fun Keys.

The motivation framework model is an abstract model in the sense that each field contains theoretical terms that can cover different game elements and mechanics. Our understanding of such game elements and mechanics is concretised by both Player Components and The Four Fun Keys as they are the theories we used for the analysis.

Through the analysis of the games, we have found that Player Components and the Four Fun Keys share certain aspects. By implementing the elements of both of these theories in the motivation framework, we can visually represent these similarities. We found that player interaction and NPC interaction actually cover both Competition and Teamwork of Player Components. This illustrates that both theories have many layers of motivators and game mechanics, and therefore it is difficult to cover everything with only one word or term.

Prior to the analysis we used the basic psychological needs as criteria for choosing which games to analyse and presented it in Table 3 in section 6. We judged that Skyrim contained the possibility to satisfy the need for autonomy and relatedness, while WoT satisfied the need

for competence, alongside relatedness. Through the analysis we found that both games encompasses all three needs to a certain extend. Thus the table can now be presented as follows:

Computer Game	Need Satisfaction		
	Autonomy	Competence	Relatedness
World of Tanks	o	X	o
Skyrim	X	o	o

Table 16: Need satisfaction priorities (X = primary, o = secondary)

The important aspect of creating the motivation framework is that we have mapped out each theory and made a connection between them. This enables us to better clarify the concepts of player motivation, human motivation and fun in relation to computer games.

Through the analysis we have found a connection between player motivation and human motivation which is illustrated in the model above.

Having game mechanics does facilitate different player choices and each choice can be based on a goal of an emotional reward. We found that player choice does not necessarily have to be connected to emotions only, but also an intrinsic motivation. An example of this is the emotion of fiero which can be achieved through mastery. Since mastery entails being able to overcome challenges and feel competent it can be directly linked to the need for competence. In this sense, all emotional rewards connected to player choice can be linked to the basic psychological needs from SDT.

Until now we have been looking at computer games in terms of the intrinsic motivation a player can have for engaging in the activity of playing, and many elements of game design can effectively influence the feel for competence, autonomy and relatedness in a positive way. Even so, we also compared the game mechanics of World of Tanks and Skyrim with the aspects of extrinsic motivation. In the perspective of SDT, extrinsic motivation is part of controlled motivation which leads to negative development in well-being (Deci & Ryan, 2000). We recognize that the analysed games also feature purely extrinsic rewards (e.g. in the form of external rewards for completing challenges). Furthermore, it can be argued that there are many bad ways of implementing game design which could lead to the emphasis of extrinsic motivation rather than intrinsic motivation.

Looking at the landscape of computer games today, almost every game feature so-called “achievements”, in the form of trophies (on the Playstation 3), gamer points (on Microsoft Xbox 360) and achievements on the Steam platform. In section 4.3, we described operant conditioning and its connection to external regulation in SDT. We mentioned how reward structures can be used to keep players playing a game by letting valuable items be rewarded at random,

which we do not deem as good motivation to play a game. As the analysis shows there also exists positive ways of stimulating a player through game design to achieve positive emotions, and in the end it all boils down to reward structures in computer games and how the game developer facilitates these rewards given to the player for achieving specific goals.

As we describe in section 4.2, the field of SDT assumes that the knowledge on whether a person's motivation is more autonomous or controlled is essential for making predictions on the quality of that person's performance and well-being. In regard to game design mechanics and the possibility for these to be of extrinsic nature, we find the motivation framework to be more descriptive in terms of intrinsic motivation and not extrinsic motivation. The assumption of the model is that the elements of game design largely cater to the intrinsic needs of people, but the truth is that many game mechanics are extrinsic. Getting achievements or rewards for reaching specific goals is instrumental behaviour as we are acting in the pursuit of an extrinsic reward. Even though computer games consist of these elements there is incentive for the developer of a game to consider which contingencies (i.e. reward structures) that can be implemented. As we have found through the definition of computer games, the activity of play is based on voluntary participation and as such is based on intrinsic motivation. Therefore, it becomes important to understand how the motivation for playing is kept intact by improving intrinsic motivation – whether the need is for autonomy, competence or relatedness. In order to illustrate the influence of extrinsic motivation, we have extended the motivation framework in the figure below. This shows that even motivational parameters inside the fields of needs can be affected by being extrinsic regulations, but this moves the game mechanic in question outside the field of intrinsic motivation. Specifically we have illustrated the mechanics of practice, stimulation and achievements as those mechanics can be designed to be more extrinsically rewarding. The Player Component, Escapism, is also a component that is more difficult to place, and it can be both categorised as intrinsic and extrinsic. Intrinsic, in the way that people seeking escapism can do so because they need to satisfy autonomy

In Figure 42, we illustrate our understanding of extrinsic motivation in relation to the motivation framework.

Figure 42: The motivation framework including the field of extrinsic motivation.

We find the whole aspect of extrinsic motivation important, since the implementation of its concepts in game design can be ideal or less ideal. Thinking in terms of operant conditioning and reinforcement schedules this can be exemplified.

Good examples of implementation of the variable ratio schedule are games such as Diablo 3 (Blizzard Entertainment, 2012) and World of Warcraft (Blizzard Entertainment, 2004), where the player has to slay monsters to advance through the game. By slaying a monster, items are dropped for the player. The higher level monsters the player fights, the higher level the awarded items are. The Skinner box aspect comes into play in that the monsters have a chance to drop items more valuable than other items, but only sometimes. This, added with the possibility to engage in fighting with high level monsters over and over again, creates a virtual Skinner box. The player can "farm"[17] a certain high level monster in the hopes of getting this special item. Throw in a diversity of character set-ups based on different skills, where only a specific combination of skills might suit a player, and the special item, when it drops, might not even suit the player's character, resulting in even more "farming". This reward system of items caters for the players driven by extrinsic rewards more so than players driven by intrinsic rewards. A good example of escape in the negative reinforcement category can be found in Farmville (Zynga,

[17] A term used by gamers to describe performing the same task over and over in order to advance in a game.

2009). In this game, players can plant crops and manage a farm, but if the player has not logged in to harvest her crops for a while, they will wither away. This creates a strong incentive to keep coming back to the game in order to harvest the crops that the player took her time to plant. This implementation of punishment of unwanted behaviour (not playing the game) is, in our mind, not a good way of getting players to play a game. Furthermore, this clash with our computer game definition in section 2.1.4, where players need to engage voluntarily rather than being punished for not playing.

Now that we have determined that the basic intrinsic needs, which motivates us to act in everyday life, also governs our motivation to play games and that the fulfilment of these intrinsic needs often yield positive emotions, we should be able to end the discussion. However, as an endnote, the ability of computer games to fulfil these intrinsic needs can be seen as a negative thing in some circumstances. Imagine a person, who might not feel in control of his own life, who might feel lonely or who feels inadequate to some extent, being introduced to a computer game able to cater for the needs of that person. This person might feel that being in the game is much better than being in the real world. This escapism can, in a worst case scenario, result in the person completely removing himself from the real world in order to have these basic intrinsic needs satisfied.

7.2 To Be Continued?

The motivation framework model presented in the previous section is largely abstract as it can be seen as a map that tries to detail the landscape of computer game design and the fun to be had from them. Just as a map might have to change over time, the framework should be able to change form to accommodate for new ways of looking at game design and player motivation. An example of this could be to introduce the levels of extrinsic motivation to the model. Even though we have presented such a framework the journey towards understanding players and their motivation for engaging in computer games is not over – and there might be bumps along the way. By using the framework as a road-map we strive to understand ways in which we can influence game design in a positive way, or at least argue for and against design decisions while referring to how these decisions can affect the psychological well-being of players and their perception of the activity of playing. Looking at ourselves, we are very conscious of the games that we want to play and we find it easy to see through computer games if they appear too shallow in their design in terms of features. Furthermore, the game industry is rapidly changing and recalling Bernard Suits' quote from section 1 it is perhaps time to look at games in a different light rather than categorising them as just pastime pleasures.

7.3 Conclusion

It is now time to conclude this MA-thesis and in order to do this we need to review the problem statement from section 3:

How can knowledge on the term "fun" in computer games help us to understand player motivation, and how does it relate to human motivation?

And also the working hypothesis of the MA-thesis that formed our pre-understanding of the subject of computer games:

The value of player choice in computer games is important to the play experience

We found, that in order to understand the term *fun* in a different way it was necessary to introduce the field of self-determination theory. With this theory it was possible to categorise and elaborate on the intrinsic motivation for playing computer games.

In order to build upon the pre-understanding of fun in terms of flow, interactivity and the structure of computer games, we introduced Nick Yee's theory on Player Components. His theory covered the behaviour of players and thereby the game elements that could work as motivators for play – thus categorising and elaborating on what players find to be fun.

For further knowledge on fun we turned to Nicole Lazarro's Four Fun Keys. These play styles were derived from the observation of players' emotions during the activity of play – representing an approach of reverse engineering in order to determine the game mechanics and player choices that could lead to having fun.

Through analysis of two computer games, and the working hypothesis, we applied the content of these computer games to the theoretical frameworks. The result hereof is a model of the motivation framework. With this framework both player motivations and human motivation is connected on basis of the term fun and the game elements that allow for it.

In the end we were able to broaden our understanding of the term fun and to connect this by relating player motivations to the underlying human motivations.

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9 Appendix

Here is a collection of stuff not deemed important enough to be in the report itself

9.1 Player Type Theory

This is an explanation of the updated list of player types by Richard Bartle.

- **Griefers** are implicit Killers who
  - attack a lot
  - are very in-your-face
  - are unable to explain why they act as they do, but might attempt give an explanation they hope you believe
  - have a vague aim to achieve a big, bad reputation
- **Politicians** are explicit Killers who
  - act with forethought and foresight
  - manipulate people subtly
  - explain themselves in terms of their contribution to the virtual world community
  - aim to get a big, good reputation
- **Friends** are implicit Socialisers who
  - interact mainly with people they already know well
  - have a deep understanding of these people
  - enjoy these people's company
  - accept these people's small weaknesses
- **Networkers** are explicit Socialisers who
  - find people to interact with
  - tries to get to know their fellow players
  - learn who and what these players know
  - assess who is woth associating with
- **Hackers** are implicit Explorers who
  - experiement to discover meaning
  - understands the virtual world intuitively
  - go where they feel like going
  - look for new phenomena yet to be discovered
- **Scientists** are explicit Explorers who
  - experiment to form theories
  - test these theories by using them predictively
  - are methodical in gaining knowledge
  - seek to explain phenomena
- **Opportunists** are implicit Achievers who
  - takes a chance if it presents itself to them
  - seek out things to do, unsure of what they are until they find them
  - do not tackle obstacles, but avoid them

    - go from idea to idea like a bee searching for pollen
- **Planners** are explicit Achievers who
    - set a goal and strive to achieve it
    - perform actions within a larger scheme
    - work around obstacles
    - persue the same idea tenaciously (Bartle, 2004)

9.2 Salen & Zimmerman: Traits of Computer Games

This is the explanation of Salen & Zimmerman's traits for computer games:

Trait 1: Immediate but narrow interactivity
One of the qualities of digital technology is its ability to deliver immediate feedback to user inputs. This means that a well-designed game system can create a seamless flow of information between user and system. The narrow aspect lies with the amount of tools available for interaction. In the case of computers, input devices are often limited to mouse and keyboard while output devices are often limited to a screen and speakers. This limitation is not a bad thing as fewer input/output devices make for less complicated interaction.

Trait 2: Manipulation of information
Computer systems are built so that all information stored within is readily available but hidden until it is called upon. This means that they are good at information manipulation. In the case of a First Person Shooter (FPS) where sounds are important to pin-point enemy and allied activity in the virtual space of the game world, the game system can manipulate the sound placement and volume correlating to where the activity is going on. Another aspect of information manipulation is how much information is presented to the player at any given point in the game. By hiding elements, such as story parts, the player can stride to gain more information to advance in the story. Information manipulation can also be used to control the difficulty level of a computer game by hiding or showing certain helpful elements, be it audible, textual or visual.

Trait 3: Automated complex systems
Computers have a powerful computational ability which can allow for complex systems to be automated. This means that a sequence of actions, which would be too complicated to perform in real-life games, can be executed automatically and very fast. Thus it is possible to play games on a computer which would be too complex to play in real-life. An example of this can be found in real time strategy games for computers, where the collection of resources is paramount for the production of buildings and units. In the computer game it is easy for the player to make the harvester go to a resource location and return with the harvested resources to the right location along the shortest route, as this is often an automated sequence in the game. In

the real world, a player would have to steer the harvester to the resource location herself and find the shortest way there and back to the right location with the harvested resources. This would take a lot of time away from engaging in combat with other players, which such games are mostly focused on. A drawback of these automated systems can be that certain rules are hidden from the player, as the inner workings of the game are not always apparent. This means that it can be difficult to understand some aspects of a game, which might cause frustration with some players.

Trait 4: Networked communication

The ability for computer games to connect players in real time across continents through the internet is also a unique trait when compared to real-world games which are often geographically limited, except for some Augmented Reality and geocaching games[18]. In any multiplayer game, the players connect to a small network based around the game session and can communicate either with text or speak in game or in between games, or through their decisions and movement within the game world (Salen & Zimmerman, 2004)

[18] Ex: Code Runner - http://www.coderunnergame.com/

9.3 The Four Fun Keys

9.3.1 Facial Gestures and Emotions

Emotion	Game Example
Frustration (Anger)	Figuring out how to get a character off a roof in *Splinter Cell* (and created by usability issues that detract from the player's ability to play).
Fear	Falling into boiling lava, fast-moving projectiles aimed at the player in *Doom* (id Software, 1993).
Surprise	Using the linking books in *Myst* (Cyan Worlds, 1993) for the first time to transport to a new world. This is often followed by wonder.
Sadness	When the young magician Aerith in *Final Fantasy VII* (Square, 1997) is murdered.
Amusement (Happiness)	When two Sims get married in *The Sims* (Maxis, 2000), or rolling over and picking up sumo wrestlers in *Katamari Damacy*.
Disgust	Becoming a social outcast (social disgust) after losing the dancing challenge in *Sid Meier's Pirates!* (Microprose, 1997). This moment also creates contempt.
Curiosity*	Wanting to know what happens by driving the race track the wrong way in *Project Gotham Racing* (Bizarre Creations, 2001).

** Not all researchers (including Ekman) considered curiosity a universal emotion with a unique facial gesture. I include it here as a seventh emotion because of its importance in games and ease of observation.*

Figure 43: Observed emotions from universal facial gestures (Bartle, et al., 2009, p. 10)

9.3.2 Player Experience and PX Spirals

PLAYERS ON HARD FUN

What players like about the way games offer the opportunity for mastery:

- Playing to see how good I really am
- Playing to beat the game
- Having multiple objectives
- Requiring strategy rather than luck

Figure 44: Players on Hard Fun (Bartle, et al., 2009)

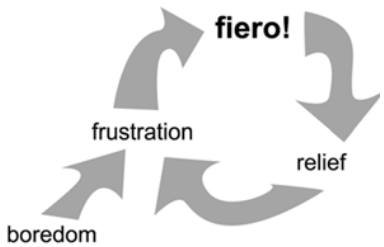

Figure 45: Hard Fun PX Spiral (Bartle, et al., 2009)

PLAYERS ON EASY FUN

What players like about the way games engage their imaginations:

- Exploring new worlds with intriguing people
- Excitement and adventure
- Wanting to figure it out
- Seeing what happens in the story, even if I have to use a walkthrough
- Feeling like me and my character are one
- Enjoying the sound of cards shuffling
- Growing dragons

Figure 46: Players on Easy Fun

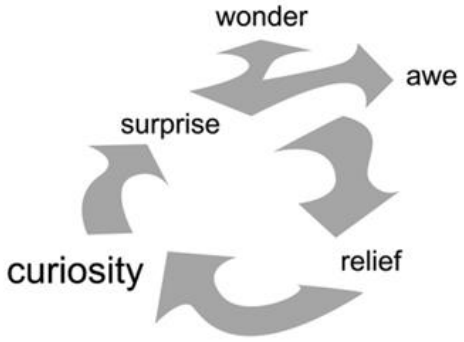

Figure 47: Easy Fun PX spiral (Bartle, et al., 2009)

PLAYERS ON SERIOUS FUN

What players like about the way games create value:

- Clearing my mind by clearing a level
- Feeling better about myself
- Avoiding boredom
- Being better at something that matters

Figure 48: Players on Serious Fun (Bartle, et al., 2009)

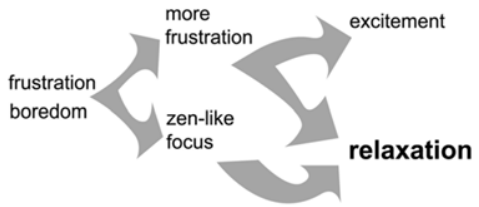

Figure 49: Serious Fun PX Spiral (Bartle, et al., 2009)

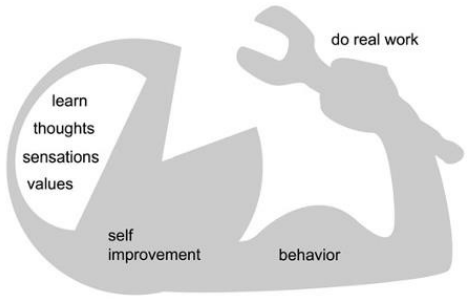

Figure 50: Purposeful play changes real world and self (Bartle, et al., 2009)

PLAYERS ON PEOPLE FUN

What players like about the way games bring their friends closer:

- It's the people that are addictive, not the game
- I want an excuse to invite my friends over
- I don't like playing games, but it's a fun way to spend time with my friends
- I don't play, but it's fun to watch

Figure 51: Players on People Fun (Bartle, et al., 2009)

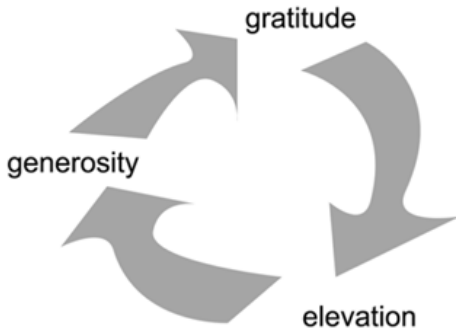

Figure 52: People Fun PX spiral (Bartle, et al., 2009)

9.4 Additional Information on Analysis Material

9.4.1 World of Tanks

We have chosen World of Tanks because its popularity and large user base of 45.000.000 as of December 20, 2012 (World of Tanks, 2012) (see also Figure 59). Furthermore, it holds the Guinness World Record for most players online simultaneously (Guinness World Records, 2013).

9.4.1.1 Main Interface

The main interface of WoT can be seen in Figure 53. In the top centre of the screen is the Battle button, which takes players into battles. Only one tank can be taken into battle at a time. If a player is destroyed, he can return to the main interface and pick another tank. Right below the Battle button is a drop-down menu containing different ways of battling. Below this is a line of links giving access to the Garage from where the player has access his tanks and their stats, the Depot containing vehicles, modules, equipment, ammunition and consumables currently owned by the player, the Store containing the same available for purchase, the Service Record containing the stats and medals of a player, the Tech Tree with all the different nations' tanks, and Barracks containing the different crew members. It is also possible to access the crew members of a tank from the menu on the left, where crew members are listed with a photo and their role in the tank along with their training level. In the bottom of the Garage, the player can select the tank he wishes to battle in, view the modules and equipment fitted, and manage the type of ammunition and consumables in Service. Players can also change the appearance of the appearance of their tank in Exterior. To the top right, the player has access to purchase premium time, a link to purchase gold for real currency through WoT's portal on the Internet, access to convert XP from elited tanks (tanks with everything researched), and finally a shortcut to the position in the Tech Tree of the tank selected for quick access to research.

Figure 53: Main interface of WoT

9.4.1.2 Battles:

There are three different game modes in WoT: Standard Battle, Encounter Battle and Assault, where two teams of 15 players compete.

Figure 54: Standard Battle map layout

In Figure 54 an example of a Standard Battle layout has been given. Here the teams start at their own base and the goal is to destroy all enemy tanks or capture the enemy base before the time limit of 15 minutes has been reached.

Figure 55: Encounter Battle map layout

In Figure 55 an example of an Encounter Battle layout has been represented. Here the two teams start at spawn points on opposite sides of the map with a single base which both teams have to capture, unless one team has been destroyed. The time limit is 15 minutes for this game mode as well.

Figure 56: Assault mode map layout

In Figure 56 the layout of the Assault mode has been illustrated. In this game mode one team has to defend a base from the enemy team. The time limit for this game mode is only 10 minutes.

These game modes can be experienced in Random Battles, Tank Companies, Clan Wars and Team Training. In Random Battles, players can enter battles on their own or with one to two others in a platoon. In Tank Companies groups of up to 15 players can drive together against other teams. Players can gain XP and credits, according to how well they performed in a battle, from both Random Battles and Tank Companies. Clan Wars are fought on a global map, where clans can place units (representing clan members) on the map to try and capture provinces. The battles themselves take place in the game, while the global map is browser based. A view of the global map can be seen in Figure 57.

Figure 57: Global map of Clan Wars

In Team Training players can create training rooms, where all the different maps in the game can be selected to drive around in. No XP or credits will be earned, but there are no repair-costs either. You do pay for ammunition and consumables used.

9.4.1.3 Battle Interface

During battles players have access to a lot of information. A representation of the battle interface can be seen in Figure 58. In the centre players can see their aiming reticule along with a reload timer and health bar. They can also view amount of shots left as well as an indicator to where other tanks are hitting their own tank from. In the top the player can see how many team mates and enemy players are left. On both sides of the screen the player can view the individual team mates' tanks and names depending on the setting used. Here the player can also see exactly who is still alive in the game and how many kills each player has. In the lower left corner, the player can

also view a status square with a visual representation of his health, along with modules and crew members and their status. In the bottom of the screen players can view their ammunition types, equipment status and consumables. Players can also view detailed information about crew or module damage above this. In the lower right corner is a mini-map of the battlefield with team mates and enemy players in range of the player. A chat function can be activated above the status square by pressing the Enter key, from where players can write to his own team, both teams and his platoon. Updates of who destroys who are displayed above the mini-map.

Figure 58: A screenshot of the battle interface

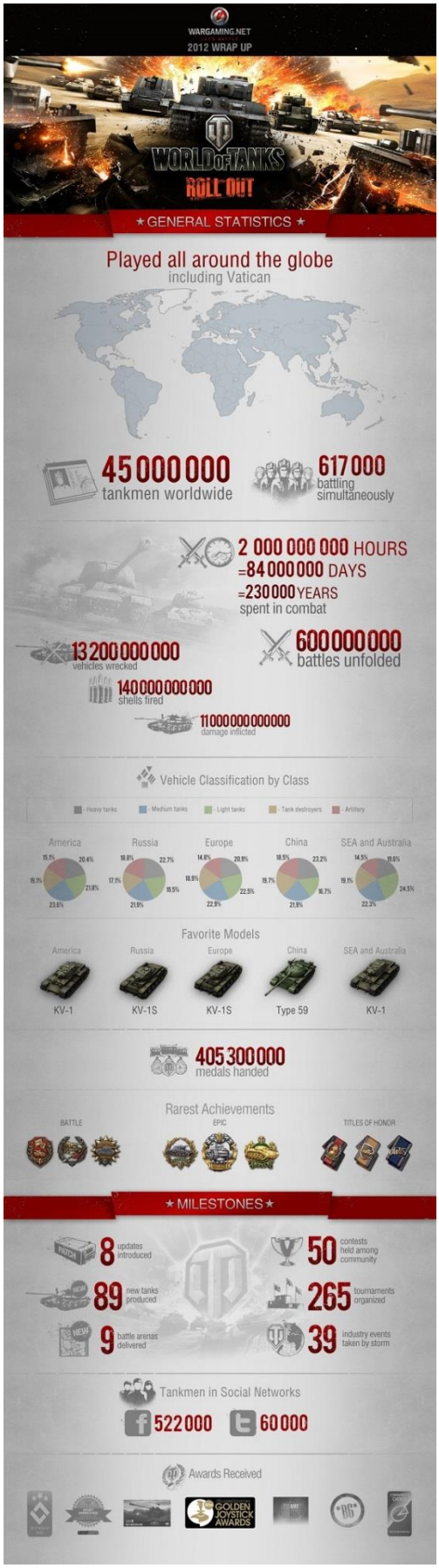

Figure 59: Infographic of some numbers from WoT (World of Tanks, 2012)

9.4.2 Skyrim

The Elder Scrolls V: Skyrim is an action role-playing game released by Bethesda Softworks on November 11, 2011. It is a single-player game in which the player is able to control a customised avatar through first-person perspective (i.e. viewing the game world through the eyes of the character) or third-perspective (i.e. the character is visible on the screen).

At the 2012 Golden Joystick Awards, Skyrim won three awards: Ultimate Game of the Year, Top Gaming Moment and Best RPG (PC Gamer, 2012). Furthermore, there was sold 7 million units of Skyrim the first week of release and 10 million units in total, and the highest number of concurrent players on Steam was 280.000 in 2012 (Statistic Brain, 2012).

Figure 60: Beginning of the game. First encounter with Alduin

Skyrim is in civil war following the death of its High King, and dragons are returning to Skyrim. The greatest foe comes in the form of a dragon called Alduin which in the universe of Tamriel is the consumer of worlds. The player is known as the Dragonborn (Dohvakiin), a warrior with the ability to use dragon shouts.

The game is based on character development and at the beginning of the game the player can choose from ten different races, each with natural abilities to supplement the player's other skills. The player can choose to customise his character's physical appearance (e.g. body, hair style, facial features, etc.).

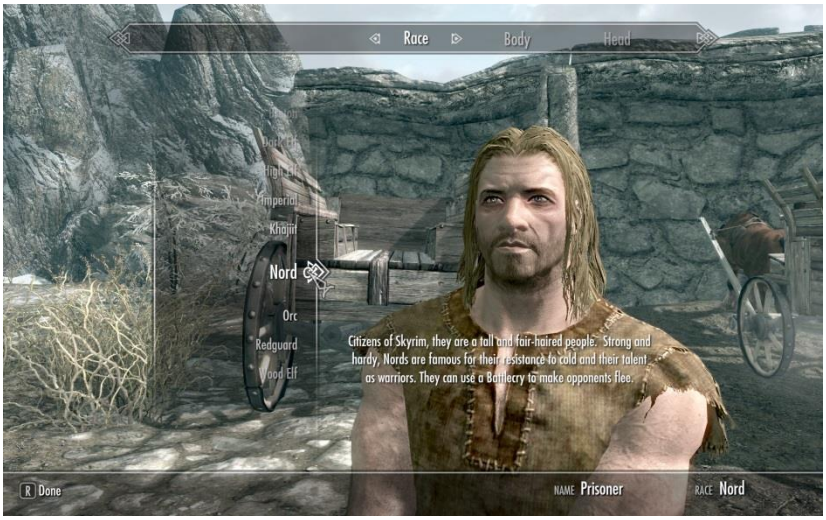

Figure 61: Character creation in Skyrim

The game is based on a character levelling system and a skill system. The player can choose from 18 skills, each of which determines how well the player can perform at certain tasks. The skills are distributed under three main categories: Warrior (combat), Mage (magic) and Thief (stealth). Skyrim does not operate with the notion of character classes. Instead, it is up to the player to define the preferred play style. The player can combine different skills to create specific ways of playing (e.g. use heavy armour and ranged weapons, or melee weapons and magic). The player has three attributes, each of which can be upgraded with ten points at each character level: Magicka (governs the use of magic such as spells); Stamina (governs the amount of attacks, power-attacks and how long the player can sprint); Health (governs the amount of hitpoints available).

Skyrim is based on quest completion. The Radiant quest system that Skyrim uses is a quest generator that creates quests from the following information: start location of the player, enemy location, and reward. These components are randomised each time a quest is triggered. There are several forms of quests: the main quest, faction quests (guilds in Skyrim) and miscellaneous quests (side quests). The quest system ensures that each play-through is different.

Figure 62: Radiant quest system at work. Encounter with NPC giving side quest to the player

The player can unlock dragon shouts for use in combat. These shouts can only be unlocked with the souls of dragons – which can be obtained by killing dragons in the game.

The world of Skyrim consists of nine regions, each with a major city: Whiterun, Windhelm, Morthal, Markath, Riften, Solitude, Winterhold, Falkreath, Dawnstar. There are also several small villages scattered throughout Skyrim (e.g. Riverwood and Ivarstead).

Figure 63: The city of Whiterun

The game is controlled by keyboard and mouse on the PC and a controller on either Sony Playstation 3 or Microsoft Xbox 360. The interface of the game shows the player the attribute bars (visual feedback on Stamina, Health and Magicka). The interface shows the player information regarding navigation (a compass showing walking direction) and notifications on updated quests.

9.5 Table of Responsibility

This table contains all the sections of this thesis. The involvement of the writers in each section will be denoted with an X. In the case that one of the writers has had slightly less responsibility for a section, this we be denoted with a small x.

	Esben Lund-Pedersen	Steffen Titken Haferbier
Introduction	X	X
Press Start to Play	X	X
Incentive	X	X
The Problem Area	X	X
Initial Understanding	X	X
Problem Statement	X	X
Human Motivation	X	X
The Psychological Approach	x	X
Self-Determination Theory	x	X
The Virtual Skinner Box	X	x
Fun in Computer Games	X	x
Player Types	X	x
An Emotional Perspective	x	X
The Four Fun Keys	x	X
Analysis	X	X
Data Collection	X	X
Method of Analysis	X	X
The Elder Scrolls V: Skyrim	x	X
World of Tanks	X	x
Summary of Analysis	X	X
Final Thoughts	X	X
Discussion	X	X
To Be Continued?	X	X
Conclusion	X	X
Reference	X	X
Appendix	X	X

Figure 64: Table of responsibility