Escola das Artes - Universidade Católica Portuguesa

Master's Degree in Audiovisual Arts

Engagement in Independent Video Games through Narrative and Character Development

Computer Animation 2012/13

Vasco Pires Prazeres

Chief Advisor: Maria Guilhermina Castro, Ph. D.

Associate Advisor: Prof. Ricardo Megre

January, 2013

Overview

Independent videogames (also known as “indie games”) have experienced an increasingly prominent role in the videogame industry. In the last decade, this particular genre has seen an exponential growth, filling its own niche in the market.

Furthermore, the low level of investment required by this genre (both in terms of economical and human resources) makes it a favoured path for small companies to start producing videogames. This paradigm of low resources, allied with the technological limitations of mobile devices (this genre's most common platform) defines the “indie game's” playability and visual/narrative aesthetics; the result being a peculiar creative simplicity.

We believe this simplicity to be the source of the independent videogames' appeal to the general playerbase. In other words, these videogames engage the player by presenting him/her with a simple yet rich storytelling experience, where complex elements such as long cinematics are eschewed in favor of a more primal and direct experience. Simply put, by investing on a solid narrative and fleshing out interesting, relatable characters, an independent videogame manages to achieve the engagement potential of its commercial counterparts, while doing so with a fraction of the cost.

In this dissertation we aim to understand exactly how independent videogames achieve this phenomenon of player engagement through their narrative and characters. We will do so by allying theoretical research on these two creative resources with a the practical exercise of developing our own videogame concept (as a part of our Master's Degree project). Strictly speaking, we will study tools and techniques relating to achieving engagement through narrative and character development, subsequently testing them out in our own project and drawing conclusions on their effectiveness in the process.

< Keywords: Independent, Videogame, Character, Development, Narrative, Engagement >

Content Index

List of Figures....6
Glossary....7
1. Introduction....8
1.1. Independent Videogame Context....8
1.2. Main problematic....10
1.3. Chosen methodology....11
1.3.1. Abridged Timetable....12
1.4. Dissertation structure....12
2. Independent Videogames: Historical, Technological, Theoretical and Artistic Context....15
2.1. Historical and Technological Background of the Videogame Industry....15
2.1.1. Early Years (70s)....16
2.1.2. The Golden Age of Videogames (80s)....18
2.1.3. The Withering of the Arcade (90s)....19
2.1.4. 21st Century and the Birth of the Independent Industry....21
2.2. Studies on Engagement, Narrative and Character Development Theory....22
2.2.1. Engagement: The connection between the Player and the Virtual World....23
2.2.2. Character Behaviour: Building Believable Characters....25
2.2.2.1. Artificial Intelligence: Character Development from a Programming Perspective..26
2.2.2.2. Character Development from a Creative Standpoint: Within and Without Videogames....40
2.2.3. Narrative in Videogames and Other Media....44
2.3. Outstanding Works in the Videogame Industry from a Narrative and Character Development Perspective....52
2.3.1. In the Mainstream Industry....53
2.3.1.1. Prince of Persia: the Sands of Time....54
2.3.1.2. Legend of Zelda: Majora's Mask....56
2.3.2. In the Independent Industry....59
2.3.2.1. Limbo....60
2.3.2.2. Bastion....62
2.4. Conclusive Note: Contributions of the Research as a Starting Point for a Master's Degree Project....64
3. Dead Harvest: development of a Videogame Concept....65
3.1. Decisions Pertaining Narrative in Dead Harvest....68
3.1.1. The Unknown World: using a player's curiosity towards the plot as a means of engagement....69
3.1.2. Linearity vs. Non-Linearity in the Dead Harvest narrative: planning out the narrative 71
3.1.3. Cutscenes in Dead Harvest as a Narrative tool....73

3.2. Wicker's Humanity: generating player empathy through the development of a character's personality....75
3.3. Fostering Player Interest and Engagement through other Resources....78
3.3.1. Dead Harvest as a Puzzle/Adventure Game: ramifications of genre regarding engagement....79
3.3.2. Visual Experience in Dead Harvest: achieving engagement through the videogame's aesthetical elements....81
Final Note: Project, Dissertation and the Contibutions of both to the Author's Personal Development....84
Bibliography....86
Appendices....88

List of Figures

Fig. 1. Relation between openness of eyes, gaze orientation and iris position for neutral (top), anger (middle) and surprised (bottom) emotions.....29

Fig. 2. Linear Experience in Non-Linear Space.....45

Fig. 3. Non-Linear Gameplay.....46

Fig. 4. Schematic of Campbell's journey of the hero.....49

Fig. 5. Prince of Persia: The Sands of Time - gameplay footage. 55

Fig. 6. Legend of Zelda: Majora's Mask - gameplay footage. 58

Fig. 7. Limbo - gameplay footage.....61

Fig. 8. Bastion - gameplay footage.....63

Fig. 9. Concept art for the character Wicker – scarecrow form (left) and spirit form (right).....66

Fig. 10. Early “Cell-Shading” test – Barn Level.....82

Fig. 11. Final Compositing test – Farm Level.....83

Glossary

- "Indie" – Independent;
- PC – Playable Character;
- NPC – Non-Playable Character;
- RPG – Role-playing Game;
- ARPG – Action / Role-playing Game;
- FPS – First-Person Shooter;
- AI – Artificial Intelligence;

1. Introduction

1.1. Independent Videogame Context

Independent videogames (also known as "indie games") have been playing an increasingly prominent role in the videogame industry. In the last decade alone, this genre has grown exponentially, expanding a long way beyond its initial market of mobile applications for smartphones.

On the other hand, the fact that game development in this area requires few to no investment is also a defining factor in the proliferation of various micro and small companies specializing solely on the genre. This paradigm of low investment of human and financial resources, coupled with the technological limitations of mobile devices (compared to mainstream console systems and computers), is a key influential point of the playability and visual/narrative aesthetic of the videogames in this area; resulting in a peculiar creative simplicity.

The aforementioned simplicity is the basis of all the development process regarding characters and narrative in independent videogames. In fact, the main aspect that distinguishes independent videogames from the mainstream circuit is born from this resource management; which, in turn, creates an unique experience of engagement and immersion, both immediate and elementary beyond what mainstream can provide.

We believe these unique elements, present in independent videogames, stem from two distinct dimensions. Firstly, the *aesthetic* part of the game, which encompasses every medium through which the game communicates with the player; in other words, every sensory element that engages the player's mind (such as sounds, visual elements, etc.). Secondly, the *gameplay* part of the game, which pertains to the actions the player can carry out within it (as well as the limitations to these actions). In a sense, we believe the main differentiating aspect between these two videogame dimensions to be the underlying relationship between the player and the game in both perspectives: the aesthetic part is a one-way communication stemming from the game to the player (the game provides sensory information to the player); on the other hand, the gameplay part entails a certain reciprocity, since the player chooses actions based on how the game reacts to them (such as jumping when faced with a pitfall, for example) which, in turn, leads to an exchange of information between the two.

Examples of solid work on the aforementioned two dimensions of a videogame can be seen in the most popular titles of the genre. For example, *Limbo* (developed by *Playdead*, 2010), stands out aesthetically because of its simple visual aspect, based on shades of gray and backlight. Likewise, *Journey* (developed by *Thatgamecompany*, 2012) is defined by a cell-shading technique both rudimentary and extensively worked. On the other hand, *Tower of Heaven* (developed by *Askiisoft*, 2009), explores a system of gameplay based on basic rules (such as not being able to touch blocks of a certain color, for example). In all these cases, basic elements of the game (be them from an aesthetical or gameplay nature) are used to tell a

story in an immediate and direct way, without resorting to cinematic sequences or overly long narrative exposition (that risk breaking the flow of player immersion).

Generally speaking, many authors have already covered the subject of game design. For example, J. Robertson (2011), as well as C. Browne (2010) have already developed investigative work on the general process: namely relating to the development of a commercial videogame, and the many underlying aspects of it. Other authors sought other foci in their work, analising the development of characters and narrative within the videogame industry: L. Sheldon (2004) and M. Ingebretsen's (2010) studies step away from the technical aspect of commercial videogames, focusing solely on their creative potential. However, and despite the fact that some authors have already studied independent game design (D. Michael in 2003, for example), there's still a distinct shortage of academic studies that manage to juxtapose the specific dimension of character development and narrative with the singular aesthetic of the independent video game.

1.2. Main problematic

The main problematic of this dissertation stems from two prominent aspects in the definition of the “indie” aesthetic. On one hand, the notion that independent videogame narrative fundamentally seeks the simplification of creative means, unravelling a plot in the least expositive and conspicuous way possible. On the other hand, the fact that independent videogames lean heavily towards using the aesthetic and gameplay elements of the game as the primary ways to advance said plot (as opposed to using spoken dialogue, for example).

As such, we'll proceed to reflect on narrative and character development in light of these two main aspects. We aim to analyze in depth the question of how the unique identity of an independent videogame affects the process of character development and narrative for that particular *medium*; in other words, we wish to attain better understanding of how these subtle aspects of a videogame (such as setting, gameplay, design, etc.) can be conscripted to serve the plot and characters in a relevant way.

At the base of this main problematic is the concept of engagement, which we also intend to delve into with our research. Understanding the phenomenon of a person's connection to an audiovisual *medium* (in this particular case, an independent videogame) will be key to establishing its connection with the aforementioned aspects of a videogame.

Through that logic we expect in this exercise to understand exactly which tools work more effectively in the particular creative process of the narrative and character development for an independent videogame; hopefully establishing a base model for future creative works in the area.

1.3. Chosen methodology

Firstly, we intend to undertake the deductive exercise of applying the existing theory in engagement, character development and narrative (both in mainstream videogames and in other creative areas) to the specific area of independent videogames. In other words, we aim to establish a connection between the theory postulated in academic studies relative to narrative in entertainment in general (with a particular focus on game design, of course) to the "indie" area specifically, seeking to understand the points of intersection and difference between these two dimensions. In these publications we've included the aforementioned authors (C. Browne, L. Sheldon, D. Michael, etc.), among others.

We also aim to study this area in light of more general authors in the area of character development and narrative, namely Vladimir Propp, Joseph Campbell and Christopher Vogler; the reason for this being that we consider the universal nature of their works to make them pertinent for any study in engagement through narrative, no matter what the *medium* in focus might eventually be.

From this first exercise of theoretical research we expect, through a deductive logic, to postulate a new series of tools and resources specifically modelled for the development of characters and narrative in independent videogames. In a way, we seek to appraise which creative writing resources make sense in this particular universe, as well as the reason for that to be so. Both exercises will mainly focus on pertinent and present examples on the independent games industry, namely, works that, through their quality and public acclaim, have stood out from all the other works in the industry.

Subsequently, we'll proceed to establish a relationship between the conclusions drawn from the two previously mentioned exercises with our final Master's Degree project, which will be developed in tandem with this dissertation. In other words, we'll use the new creative resources discovered during the dissertation project not only to enrich the project itself, but also to better understand their own relevance, through the exercise of actual practical application. For this reason, we consider this particular exercise to hold the potential to dramatically contribute to the relevance of the whole dissertation as a parallel analysis of our own work.

Finally, we've decided to write this dissertation in the english language. We do so because of the expansive nature of the language itself; we believe this choice to enable our work to more easily be shared and transmitted worldwide, be it throughout the academic or the professional circuit.

1.3.1. Abridged Timetable

September/October (until 16/10): Reflection on the theme of the dissertation. Initial analysis of the theoric context and bibliographical research (the research will be subject to constant updating until April).

- Final Project – Scriptwriting, character development and concept art.

October/November (until 07/11): Organization of the bibliography. Initial analysis of the historical, technical and artistic context. Formalization of the theme/problematic for the dissertation. Writting of the theme proposal for the cientific council.

- Final Project – Storyboard, Animatic and Model-Sheet development.

November/December: Development of chapters 1 ("Introduction") and 2 ("Independent Videogames: Historical, Techonogical, Theoretical and Artistic context") of the dissertation.

- Final Project – Modelling, texturing, rigging and animation tests for the main characters.

January/February: Development of chapter 3 ("Dead Harvest: Analysis of Creative Resources in the Narrative and Characters") of the dissertation: study analysis on the final Master's Degree project.

- Final Project – Modelling, texturing and scenario set-up. Character animation. Character implementation on the graphic engine and coding tests.

March/April: Development of chapter 4 ("Conclusion: Relevant Resources in narrative and Character Development for Independent Videogames") of the dissertation.

- Final Project – Development of the presentation trailer. Exporting of the alpha versions of the game. Contingency time for unforseen delays.

May: Finalizing of the dissertation / final writing details. Contingency time for unforeseen delays.

June (until 21/06): Final review of the dissertation.

1.4. Dissertation structure

This dissertation will be modelled around two major points: the first being the analysis of a series of the background within the area of character development and narrative and the second being an application of the results of such an analysis to a practical case of independent game design.

The background analysis will consist of a contextualization of the area from a historical/technological perspective, as well as from a theoretical and artistic ones. The first contextualization (historical/technological) will focus on the path of the videogame industry, divided amongst four sub-chapters, each covering roughly a decade: the seventies, which saw the rise of the first market-relevant videogames; the eighties, which witnessed the meteoric rise of the industry and the proliferation of the arcade machines; the nineties, when the home console systems overtook the arcade, leading to a decay in its use; and the 21st century, whose technological advancements, among which the Internet stands out the most, caused a colossal paradigm shift in the gaming industry. With this sub-chapter we intend to give the reader a more solid understanding of how the Independent Videogame industry came to be, as well as the role of the Internet (for example) in its creation.

Furthermore, the theoretical contextualization (the following focus) will analyze various academic studies on the subject of engagement, narrative and character development that, regardless of their specific *media*, prove relevant to our research. In this chapter we will first take a closer look at the studies pertaining engagement, still within the videogame industry. In other words, we'll analyze some works involving the concept of player interest in a videogame, as well as how this phenomenon can be traced to any particular aspects of it.

The following sub-chapter in the theoretical contextualization will analyze actual studies on videogame narrative from a creative perspective; while these are eminently steered towards mainstream game design (instead of independent game design), they nonetheless yield valuable information as well, since the two areas are, for all intents and purposes, similar in many ways.

Finally a third sub-chapter in the theoretical contextualization will touch upon relevant works related to character development. Notice that in this sub-chapter and the previous one, we will study the works of authors that have proved relevant for any area of character development and narrative, regardless of the *medium* in question. While these works are mostly (if not solely) steered towards literature, their contribution to various other areas over the years has made them staples in any solid study of these particular areas.

Still within the background analysis we will include a third chapter, dedicated to the artistic contextualization of the videogame industry. We will analyze three works in both videogame areas (both mainstream and independent) that have stood out from a narrative perspective. In other words, we will look more closely at some of the most acclaimed stories and characters in the industry, while attempting to ascertain the reasons for their success.

The second major point of this dissertation will be the application of all the knowledge obtained from the first point to the ongoing Master's Degree project. As our research yields usable tools and techniques, we will try to apply them to the practical nature of our project, drawing conclusions on their viability and effectiveness as we do so.

These conclusions will then be properly organized and reflected upon in one last chapter, where we will look back on the whole process and reflect on the knowledge achieved by this exercise.

2. Independent Videogames: Historical, Technological, Theoretical and Artistic Context.

2.1. Historical and Technological Background of the Videogame Industry

While the videogame industry has only existed for merely half a century, it has already undergone drastic changes; enough to arguably be considered one of the fastest-evolving entertainment *media* of all time. While the precursors of the videogame can be dated back to as early as the sixties (the TX-0 machine at MIT, United States, 1960/61), we believe it to be more pertinent to our research to focus on the seventies and onwards; we do so because it's our view that the potential of videogames as an entertainment *medium* only started to be developed around that time.

2.1.1. Early Years (70s)

The reason why we believe the seventies to be considered the early years of the videogame industry is that, while the game *Spacewar* already existed in the previous decade, it was not a marketable product, but instead a University project. In fact, during this time, a lot of videogames were still developed within Universities (such as Stanford University's *Galaxy Game*), as these institutions were the ones with most ready access to the computer technology necessary to play these games.

However, it wasn't long until comercial companies such as Nutting Associates started developing their own coin operated arcade machines and selling them as entertainment products. Thus began the first steps into the arcade age.

One of the most well-known games in this era is the 1972's *Pong*, a simple ping-pong game that nevertheless revolutionized the way the public saw video games. Its casual learning curve, allied to the inherent fun associated with it (a basic but fundamental element of a successful videogame), made it into a classic game, still played by fans to this day. This catapulted Atari from a small start-up company to one of the highest engrossing colossus in the market itself, let alone the videogame industry.

S. Kent (2001) chronicled this meteoric ascension in his book, “The Ultimate History of Videogames Revisited”, starting with Nolan Bushnell and Ted Dabney's application to have Atari incorporated as an interactive entertainment company. This would be the first videogame company to tap into the profitable nature of the *medium*. Starting out with an investment of merely $500, Atari would grow into a $2-billion-a-year engrossing company within merely 10 years, making it the fastest-growing company in U.S. History in any *medium*, videogame or otherwise.

The unparalleled success of Atari was in no small part due to its masterpiece, *Pong*. This singular game enjoyed massive popularity from the moment it was released; its coin-operated arcade machines often engrossing four times as much as other game machines, according to Kent. In fact, between 1973 and 1974, the number of orders for *Pong* machines grew from an already respectable value of 2500 to over 8000, more than any other arcade machine to the date.

However, Nolan Bushnell, Atari's leading mind, wasn't the only visionary in the industry during the seventies. While *Pong* increasingly earned unprecedented success, Ralph Baer licensed with the company Magnavox the working prototype of the first home console system, releasing it in 1972 as the *Magnavox Odyssey*. The ability to play various different games on one system was, at the time, unheard of; a fact that led to over two million units of this console being sold in just two short years.

Atari would soon follow with the Atari 2600, their own prototype home entertainment system. However, Atari, unable to properly protect their patent (due to the infant stages of the technology, not yet sufficiently protected by the law) suffered greatly from other companies

plagiarizing their work. By 1977, the sheer number of *Pong* "clone-games" greatly devalued the product and market, leading to a sales crash that almost destroyed the industry.

According to S. Kent, as soon as Nolan Bushnell released the first prototype arcade machine for *Pong*, dozens of competitors started studying and emulating it. Furthermore, unlike Baer's home entertainment system, the *Odyssey*, *Pong* arcade machines implied a more complex process of patenting, which made it impossible for Bushnell to protect his technology. By the time the patents arrived, other companies had already released and profited from their copies of *Pong*. In a way, in Kent's own words, "Bushnell had entered into an industry in which success spawned imitation (...)"[1]: it is our view that this shortcoming in the industry was the one that ultimately led to the aforementioned sales crash and the near-death of the videogame as an entertainment *medium*.

In 1978 however, Taito would release a game that would breathe new life into the videogame industry...

1 The Ultimate History of Video Games Revisited. Kent, S. (2001). - p. 76

2.1.2. The Golden Age of Videogames (80s)

The colloquially named "Golden Age of Videogames"[2] started in 1978 with the release of *Space Invaders* by Taito, a game that breathed new life into an industry that was about to collapse in 1977. Space Invaders was a massive success in Japan, before moving to the Western market. As stated by Kent in his studies, over 100000 *Space Invaders* arcade machines existed in Japan by the end of its life. In the author's own words, "So many people were playing the game that it caused a national coin shortage. The Japanese mint had to triple the production of the 100-yen piece because so many coins were glutted in the arcades."[3]

The still-existing videogame company Midway was the one to introduce *Space Invaders* to the United States in October 1978. Similarly to what happened in Japan, the game was an immense success right from the start, causing Midway to receive more orders than it could handle (which, in turn, forced the company to quickly expand and adapt to the massively bigger market). As a result, within a year, 60000 *Space Invader* machines were sold in the United States by the company. Arcade machines were suddenly one of the most lucrative sources of income for any establishment.

Meanwhile, the home console market kept expanding as well. The second generation of home entertainment systems took advantage of the success of many arcade games (such as *Space Invaders*, *Pac-Man*, etc.), adapting them to cartridge versions. Nonetheless, the sheer volume of demand for these products caused the need for publisher companies to step in and take over distribution. It was at this time that well-known present publishers, such as Nintendo and EA Games rose and distributed some of the most popular titles in videogame history, such as *Prince of Persia*, *Legend of Zelda* and *Super Mario*; these three titles, for example, turning into multi-million franchises that have survived to this day.

2 Due to its popular nature, the expression "Golden Age of Videogames" can't be traced to any specific author, rather being adopted by many during the years after its creation.

3 The Ultimate History of Video Games Revisited. Kent, S. (2001). - p. 116/117

2.1.3. The Withering of the Arcade (90s)

The advent of the third generation consoles during the late eighties and early nineties, coupled with the ever-increasing popularity of a series of game franchises (such as the aforementioned Legend of Zelda), led to an increasing demand for home console systems. However, the major reason why these products started pulling ahead of the arcade machines during the nineties was their smaller size and affordability: it was much easier for an individual consumer not only to acquire one of these products, but also to have it in his/her household.

Furthermore, the easier marketability of the home console made it the main focus of the consumer-oriented companies, which, in turn, channeled most of the technological development investment into these products. As such, fundamental advancements such as 3D graphics were first introduced in this medium (for example, with the Sega Saturn in 1994), further distancing them from the arcade consoles, which usually caught up on these advancements only after the technology had hit the market.

On the other hand, the handheld console systems were rising in popularity as well; their lightweight hardware, accessible prices and portability made them into very popular and sought-after products. Nonetheless, the real driving force behind the popularity of these products was Nintendo's adaptation of the cartridge system to the handheld console with the *Gameboy* system in the early nineties. Before the *Gameboy*, portable consoles only had a set number of games, usually of very low complexity; the *Gameboy* was the first to actually represent a miniaturization of a home console, capable of running more different games than any other handheld console at the time.

Portable or otherwise, videogames were becoming increasingly immersed in the nineties' society. Although arcade gaming was constantly losing popularity, all other dimensions of the industry were flourishing. In his study, Kent also covers the sociological implications of this episode in videogame industry, chronicling the videogame's expansion into other *media* in the United States.

A prominent example of this phenomenon, used by the author, is *Walt Disney Picture*'s movie *Tron*. The plot in this film revolves around the adventure of a software engineer named Kevin Flynn, who finds himself inadvertedly pulled into a virtual world within a supercomputer. He must then fight an evil software in a series of video game-like battles. Being the first movie to feature computerized special effects, *Tron* was then adapted to two arcade systems by *Bally/Midway, Tron* and *Discs of Tron. Mattel*, on the other hand, adapted the franchise to home entertainment systems.

However, the presence of videogames in entertainment wasn't just as a focal point of the plots. Being now a definitive part of society, videogame consoles (and even arcade machines) appeared in TV fiction series and movies. TV channels directed to teenage and young adult audiences such as *MTV* started to air shows about videogame releases and reviews. The presence of the videogame in the social *media* was everywhere.

Furthermore, the increasingly fervent demand for videogames, caused companies such as *Columbia House* to devise new ways of reaching the videogame consumer; in this case, the creation of the *Columbia Cartridge Club,* which allowed customers to order videogames and have them delivered to their own residences. As these services became more common, other companies, such as *Tele Soft, Inc.*, and *VideoLivery* sought to go even further. These companies, mainly operating within internet and cable communications, started experimenting with videogame sales through those same channels, allowing for a faster process of order and delivery. As history has shown us, these would be the experiments that paved the way for the next (and most recent) *medium* of the videogame community and industry: Online Gaming.

2.1.4. 21st Century and the Birth of the Independent Industry

The dawn of the 21st Century was marked by an increasing competitivity between the major distribution companies. The evolution in console technology was more important than ever, as the companies tried to outdo each other for supremacy in the gaming market; proof of this fact being that, between the nineties and the present year (2013), four generations of consoles arose, each completely breaking the limits of the previous generation's technology. Budgets for mainstream games reached never before seen heights, with some console game franchises now being worth millions.

However, as Internet connections became affordable to the general public, computer games started to offer something home consoles lacked: the multiplayer community experience. While the multiplayer experience in a home console was limited to the number of players next to it (usually four at the most), an Internet connection meant playing a game with literally thousands of people. This gave rise to a new videogame genre, the Massive Multiplayer Online Game, where the community and the game itself were joined together in a virtual world.

Nevertheless, the Internet did more for the gaming community than provide a massive multiplayer experience. As happened with thousands of other areas of interest, the videogame community found within the Internet a way to exchange opinions and even share games. With the constraint of the publishing contract lifted (seeing as the Internet provided a way to spread any work worldwide), small game designers started to develop small games of their own. These games, unrestrained by the obligations that million-dollar contracts imposed on their mainstream counterparts, were free to creatively explore new areas of narrative and narrative, which had become stagnated in the mainstream industry.

This phenomenon, due to its recent nature, hasn't been the subject of a relevant number of academic studies. However, the popularity of independent videogames has been rising in a remarkable way during the past decade; that fact, as well as the divergent creative route this industry is taking, are what led us to focus on this particular area of study.

2.2. Studies on Engagement, Narrative and Character Development Theory

As the industry developed towards the end of the 20th century and beginning of the 21st, the economic potential of the videogame as an entertainment commodity also experienced an exponential growth: more and more people were buying and consuming videogames, which, in turn, turned this market into an increasingly profitable one.

This growth, coupled with the videogame's ever-increasing presence in our society as a form of entertainment, led to a series of studies in the area, both technological and creative. On one hand, the ever present role of technology in the industry inspired several studies on new ways to interact with virtual elements; some of these (such as motion sensors) even went on to become actual gameplay resources in mainstream consoles, such as the Nintendo Wii or the Xbox Kinect. On the other hand, the creative nature of this *medium* also encouraged analysis on the aesthetics of the game itself, from the visual aspect of the graphics to the narrative and character development itself.

While we believe the studies on engagement, narrative and character development to be the most pertinent to our own, we've decided to refer some studies on other areas of game development (more technology-oriented), since we believe them to be relevant to these particular dimensions of videogame design. Likewise, since there's an undeniable connection between narrative in all *media* (cinema, television, videogames, literature, etc.), we'll also be exploring some of the theoretical work pertaining narrative and character development in general (not limited to any specific *medium*).

With this research we hope to achieve two crucial objectives. Firstly, to establish a working knowledge and understanding of the many different techniques of achieving the phenomenon of player engagement through solid writing of a videogame's narrative. Secondly, to understand how that same result can be achieved by properly developing the characters that populate the agorementioned narrative. Notice that, since both objectives hinge on the proper understanding of engagement, it is of utmost importance to the research that it starts with briefly studying that same phenomenon. This will ultimately prove useful in achieving a more solid knowledge of the effects that certain aspects of character development and narrative have on the player.

2.2.1. Engagement: The connection between the Player and the Virtual World

The study on engagement focuses primarily on what elements drive the player to create an emotional connection to the videogame, be it through the challenge, story, visuals or any other motive. Since this is the main appealing factor of a videogame, its study is paramount to the industry, as it allows a fairly accurate prediction of a videogame's quality.

In his work, C. Browne (2010) points out a very solid way to rationalize engagement: firstly, Browne defines quality in a videogame to its most simple essence, the likelihood that it will be of interest to the player. However, as the author states, this definition, while simple, entails a complex exercise into the human mind. Most players, while capable of expressing their enjoyment of a specific game, rarely can concretely define why they enjoy it. As such, understanding the connection between the player and the game from a psychological perspective is paramount to understanding the concept of engagement. Browne believes the four major attributes that create this connection to be the following:

• "Depth: games should hold lasting interest;

• Clarity: their mechanics should not be confusing;

• Drama: hope of recovery from bad positions;

• Decisiveness: end quickly once a winner is certain."[4]

These four attributes, while not all-encompassing, neatly cover the gameplay aspect of the videogame. However, they don't account for the actual psychological needs of the player. We believe these to be the defining factor in understanding engagement and consequentially develop a more structured creative setting in a game. This point of view is shared by Elizabeth A. Boyle a, Thomas M. Connolly, Thomas Hainey and James M. Boyle (2011) in their work. Their study focused more on the psychological study of the player and what he/she expects from a videogame, both technonogically and creatively. Through their analysis of other works in the area of psychology, the authors isolated a series of pertinent theories on the subject, mainly the two fundamental dimensions of engagement: "(...) the subjective experiences and enjoyment of games and motives for playing games."[5]

For the first dimension, the subjective experience, the authors base their logic on Csíkszentmihályi's (1990) construct of flow theory. The term *flow,* according to Csíkszentmihályi, defines "the rewarding, subjective, emotional state of optimal pleasure that arises when an individual is absorbed in either work or leisure activities that are perceived as

4 Evolutionary Game Design. C. Browne (2010) – p.5

5 Engagement in Digital Video Games. Boyle, E. A., Boyle, J. M., Connolly, T. M., Hainey, T. (2011) – p.722

valuable."[6] In other words, an experience that draws the person into a state of pure immersion into whatever action he/she is doing (in this case, gaming). For this phenomenon to take place, there needs to be a sensible balance between the skills of the individual and the challenges presented by the action. Furthermore, according to the authors, "the experience should be intrinsically rewarding, immersive, involve a high degree of concentration and a sense of personal control, have clear goals and provide direct and immediate feedback."[7] Looking at both flow theory definition, as well as engagement's, it's clear that both share core traits, the second merely being a practical application of the first to the *medium* of videogames.

However, the authors also postulated other relevant studies into a player's behaviour, such as *self determination*, which explains a player's motivation mechanisms when playing a videogame. Self determination theory, first proposed by Deci & Ryan (1985), hypothesises that human beings possess a need for *competence*, *autonomy* and *relatedness* that bleeds into their behavioral patterns. According to these two authors, human beings feel the need to take part in certain actions due to these three basic needs: competence relates to the human need to feel useful and capable; autonomy relates to the need for freedom of choice; relatedness relates to the need to connect with other people. As self determination theory refers to the human motivations behind any action, it can most certainly be applied to the specific action of playing a videogame, as well as the need to keep playing over extended periods of time. In this sense, it also relates perfectly to engagement.

Another theory studied in "Engagement in Digital Video Games" is the theory of *uses and gratifications* (U&G). This theory defends that human beings have certain specific entertainment needs which they fulfill through a combination of the *media* avaliable to them (in which videogames are included). While U&G theory was originally developed with the intent of understanding why people watch television and listen to music, it has since been expanded to explain why people play videogames. It's our belief that this phenomenon is due to the fact that videogames created a new entertainment need for interactivity in most people, a need impossible to fulfill with other *media*.

Finally, we found the four principles of learning, postulated by Jerome Bruner to also be of great use as tools to understand engagement in a narrative. While the connection might not be evident at first (seeing as this theory pertains to engagement in learning psychology), it can be easily adapted to a narrative setting, as it's also a process of imparting new information on a recipient. Furthermore, the practical aspect of the game itself (its rules and resources) implies a learning curve by the player as he/she masters the aspects of the game.

The four principles Bruner proposed are *Motivation*, *Structure*, *Sequence* and *Feedback*. According to the author, these four elements need to be present for an optimal learning experience: the first, pertaining to the recipient's desire to learn; the second, to the way the content is organized; the third, to the order the content is presented (from easy to hard); and the fourth pertaining to the rewards obtained for achieving certain goals.

---

6 Engagement in Digital Video Games. Boyle, E. A., Boyle, J. M., Connolly, T. M., Hainey, T. (2011) – p.722

7 Engagement in Digital Video Games. Boyle, E. A., Boyle, J. M., Connolly, T. M., Hainey, T. (2011) – p.722

2.2.2. Character Behaviour: Building Believable Characters

As the key force behind any given plot, characters are the elements that more closely establish a connection with the player; as such, their role in the relationship between the user and the *medium* (in this case, the videogame) is paramount. For that reason, it comes as no surprise that so many different authors, from so many different perspectives, have touched upon this subject, studying how to flesh out a character most effectively.

While the studies we came across during our research into this subject vary greatly in their respective areas of expertise, all entail a solid knowledge of how a character should act so as to appear more lifelike to the recipient. We believe it's this common basis that stands at the core of an efficient and fruitful character development, no matter which *medium* it's being developed for.

2.2.2.1. Artificial Intelligence: Character Development from a Programming Perspective

An important factor in videogame development is the behaviour of non-playable characters (NPCs); these characters, as their name implies, are not controlled by the player and can fill a multitude of roles, from supporting characters to enemies. Due to their independent nature (regarding the player's input), their behaviour needs to be coded. This phenomenon is known as artificial intelligence, or AI. Since a character's behaviour is intimately tied to the coding of its AI, it comes as no surprise that the technological studies on character programming place a lot of focus on that same character's traits and believability. Through our research, we've found several records of the development of AI projects that entail valuable insight towards how a character should act, so as to appear natural and real. For example, in their study, R. Bidarra, K. Goossens and R. Schaap (2010) worked on sistematizing a psychological model of emotional responses. The objective was to, then, apply this model to a working AI, mimicking the emotional responses of a real human being. The authors begin by hypothesizing that any well structured videogame title should strive to achieve three fundamental objectives:

"First, it should empower game designers and artists to declaratively and easily express their creative intent concerning the interior richness of their characters. Second, it should maintain the consistency between each character's unique traits and its emotional behavior. Third, it should facilitate conveying the subtle expressions of a character's internal state by the procedural generation and seamless integration of the corresponding facial animations."[8]

The authors then proceed to building a working model through an adaptation of a psychological analysis model to the programming environment (digital, as opposed to analogic). In other words, the authors aimed to transfer a tool that worked with continuous variables (human emotion) into quantifiable, discreet values, to as to adapt them into a coding language.

The starting point used for this exercise was the *Pleasure, Arousal and Dominance* emotional state model, first postulated by Albert Merhabian and James A. Russel. This model works similarly to a system of coordinates, defining a person/character's emotion at any given time through these three variables. Pleasure represents the level of enjoyment the character is experiencing, be it a positive experience (pleasure itself) or a negative one (pain). Arousal is connected to the amount of information the character is experiencing, ranging from boredom (low arousal value) to excitement (high arousal value). Finally, dominance relates to the character's freedom and control over the situation it's in; in other words, how much

8 Growing on the inside: Soulful characters for video games. *Bidarra, R., Goossens K., Schaap, R. (2010, August).- p.337*

circumstances (both internal and external to the character) affect its ability to freely choose its course of action.

This tridimensional cartesian model allows to break down emotions into quantifiable variables; this, in turn, allows the precise mapping of emotional responses, creating an illusion of believability. While this resource appears eminently technological (only useful for programming purposes), it actually holds a massive potential for the creation of the psychological component of a character: one can first idealize the base traits of the character (along with the four PAD variables) and then use this model to understand exactly how the character would react to certain situations (such as high arousal inputs).

Bidarra's studies, however, go beyond the character itself, also focusing on the evolution of the environment. The main purpose of this shift is to better understand how a character exists within a virtual world and reacts to its changes (such as weather, for example). This also goes a long way towards building believability. In the authors' own words:

“Current computer games strive to provide richer gaming experiences. For this purpose they sometimes offer, for example, dynamic weather systems, day/night cycles or other features which strongly determine the desired ambiance for the gameplay. However, most of the time the characters in these games are blissfully unaware of what is happening around them. This makes them seem disconnected from their environment and renders their behavior unrealistic.”[9]

According to the authors, the first way of achieving a more realistic interaction between the environment and the character consists of consistently mapping out how the first will evolve/change over time and then properly defining how these changes will affect the second. The authors achieve this by establishing a connection between the PAD model and the environmental changes affecting the character at any given point in the game.

The authors propose a way of simplifying this connection by making it dependent on meaningful character parameters, such as health and/or environmental ones, such as temperature and lighting.

Another interesting point in Bidarra's study was the adaptation of this model to the facial expressions of the character. Paying close attention to the eyes, the authors studied how variables such as gaze direction and blinking speed could be combined following the PAD model to create different physical manifestations of an emotion (such as blinking slowly to show low arousal inputs). This exercise starts by building a library of animations (animating

9 Growing on the inside: Soulful characters for video games. *Bidarra, R., Goossens K., Schaap, R. (2010, August).- p.339/340*

several ranges emotions in the character such sadness/happiness); these animations will then blend together to "(...) create more complex, vivid and appealing animations."[10]

An example given by the authors consists on how the eyes can be fixated on a certain target, denoting interest, or moving from side to side, possibly indicating restlessness. In fact, the eyes can even be unfocused, indicating a state of boredom.

10 Growing on the inside: Soulful characters for video games. *Bidarra, R., Goossens K., Schaap, R. (2010, August).- p.340*

Fig. 1. Relation between openness of eyes, gaze orientation and iris position for neutral (top), anger (middle) and surprised (bottom) emotions.

[11]

11 Growing on the inside: Soulful characters for video games. *Bidarra, R., Goossens K., Schaap, R. (2010, August).- p.341*

One of the ways found by the authors to convey character emotion through the eyes was to connect their rate of movement to the value in the arousal scale. In other words, if the character is experiencing large amounts of information input, her eyes will dart back and forth much more frequently, often switching focus. Furthermore, the character's interest in the surrounding objects (or environmental elements) is also taken into account, making her eyes focus more frequently on objects with a higher interest value. On the other hand, when the arousal value is low, the character's eyes will rarely focus on any specific objects; instead they will stare into an unfocused direction, rarely switching targets.

Likewise, a character's gaze will be directed to specific points of interest (named focus points by the authors) when in conversation with a second character (namely the eyes and mouth). The behaviour of the character's focus in this specific situation is very intimately connected to the dominance value of the character. For example, if the character is interacting with someone she deems dominant over (for example a slave or a servant), she will look that character directly in the eyes: in other words, the other character's eyes will gain weight over other focus points. Conversely, if the character is interacting with someone she feels submissive towards (for example a teacher or parent), the weight of that same focus point will be lowered, resulting in the character averting her eyes.

The direction of the character's gaze in this situation can also be connected to other traits in her personality: a shy character will most often avert her gaze when conversing with someone, while an extroverted one will usually stare into the other's eyes. Like this case there are countless other examples of using focus points to transmit emotional states (such as turning the focus point upward to show the character is lost in thought, or pondering).

Another way to transmit emotion through a character's eyes postulated by the authors is blinking. The frequency, speed and regularity of blinking can be used to convey a character's arousal levels, going faster for high inputs and slower for low. Eyelid movements will usually have a set value (in order to blink at regular intervals), but this rate is not fixed.

In fact, not only the rate of blinking, but the simple openess of the eyelids can also be used to convey arousal levels: if the character is alert, her eyes will be more open than if it's relaxed or sleepy. If we intersect this variable with the blinking speed of the character, we get more complext responses, such as blinking slower and more intently for sleepy characters and faster, wider and more frequently for alert ones. Finally, the eyelids also respond to the character's eye movements, opening more if the character is looking up and closing slightly if she's looking down.

On the other hand, T. Dujardin and J. Routier focused more on the character's behaviour towards plot advancement through simple inputs. The objective was to understand how a character reacts to different stimuli within the virtual world.

Firstly, the authors try to define behaviour within the subject, as well as elaborate further on what it entails. They begin this exercise by defining the concept of behaviour within the area

of ethology: "(...) the continuous agent-environment interactions"[12]. In other words, the authors strip the definition of behaviour to its bare basics, the group of actions performed by a character in any given environment; in this definition, environment meaning not only the physical layout that surrounds the character, but also every external factor that influences him/her.

It's from the observing of a character's behaviour (or the actions that character undertakes), that the personality of said character can be inferred. As such, it's paramount that the actions work together towards a common goal, in this case a cohesive personality. If a character's choices are inconsistent with each other, it'll be that much harder by any given observer to understand its core personality and traits.

However, the relationship between behaviour and personality is reciprocal: while the actions performed by the character are ways to communicate personality, personality has an influence on actions as well. To describe this side of the relationship, the authors quote Albert Burloud's theory of tendencies. According to his studies, tendencies are what drives a character's behaviour to certain directions, influencing it in different ways:

"• neutrality, if it has no influence on the behavior,

• attraction, if it drives the behavior to do something,

• repulsion, if it tends to divert the behavior from doing something,

• inhibition, if it prevents absolutely the behavior to do something, this is a particular, extreme case, of the repulsion."[13]

Furthermore, a character's set of abilities also influences its behaviour. If a character is unable to move quietly, for example, it can come across as careless or clumsy to the observer. In other words, the abilities of a character (or lack thereof) should also be considered when building a personality, since they define the character's actions as well. As such, assigning a certain ability to a character is, in itself, a way to direct its behaviour and, ultimately, define its personality.

Dujardin and Routier then propose dividing behaviour into two dimensions, reasoning and individuality, and tackling any outside stimuli according to the two. In a sense, they present reasoning as the character's mechanism of rationalizing any input received and individuality as the character's mechanism of choosing a reaction / devising a plan to deal with the aforementioned input.

The authors start by analysing the process from its beginning. As a character is faced with a problem or challenge, it will devise a plan to solve it, based on its abilities. The character will

12 Behaviour design of game character's agent. Dujardin, T. & Routier, J. (2010, August/September). - p.423

13 Behaviour design of game character's agent. Dujardin, T. & Routier, J. (2010, August/September). - p.423/424

then set the plan in motion, performing the actions required to fulfill it. Since both reasoning and individuality themselves lead to actions, their pertinence to behaviour is undeniable. In a way, the sequential application of these two dimensions is what connects behaviour as an abstract element of the character to actions as the practical aplication of said element.

For the exercise in their study, the authors propose creating a base reasoning for all characters, leaning on their different abilities as a way to produce different behaviours. In other words, while their reasoning will be similar, the character's respective individualities will ensure different outcomes for the same situations. In other words, when faced with a problem, every character will devise the same number of solutions; however, they will then choose a different solution each, based on their abilities and motivations a that particular time. This will create the illusion of difference in their personalities.

The role of the environment in this process is that of the objective itself. The whole process begins with the realization that the character wants/needs to change something in the current state of the environment. It's then that the reasoning part begins, followed by the choice of action based on individuality and culminating in the transformation of the environment to reach a new state, in which the goal is achieved. For example, a character may be feeling cold, reasoning that it can put on a sweater or close the window. Not having the ability (strength) to close that window, it decides to put on the sweater, therefore reaching its goal of getting warmer.

Finally, Dujardin and Routier study how this theory can be adapted to a usable character model. Again, while the main objective of the authors is to then adapt this model to a programming language, we find it to be also useful as a tool to better understand how a character will react to a certain outside stimulus. The authors named this model an Action Selection Mechanism (ASM) and postulated three stages in its development:

The first stage is the identification of the motivation. In other words, the character will first organize its motivations, ordering them by relevance. The result will be a list of every factor that influences the character's actions at that specific point in time (such as hunger, for example), as well as the corresponding weight for each (such as how hungry the character is, following the previous example). The purpose of this step is to set the variables that will be read in the other phases as the process of making a choice develops.

The second stage is the combination of the motivations set in the previous stage. In this particular step, each motivation will weigh in either heavily or lightly, depending on its weight at that particular time. In the authors' own words, the combination function (the programming protocol responsible for this step), “(...) 'votes' for the action to be performed.”[14]. While conceptually simple, this stage implies two fundamental criteria that have to be respected: first, it must (naturally) be able to precisely weigh in every motivation; second, it must enable other motivations and/or motivation weights to be added over time. This second criterion is possibly the most important of the two, as any believable behaviour has to take into account the shifting nature of motivations over time. For example, if a character is experiencing a dull hunger while going through the decision process, its

14 Behaviour design of game character's agent. Dujardin, T. & Routier, J. (2010, August/September). - p.427

corresponding motivation will probably not weigh in heavily; however, if that same hunger suddenly spikes (what is commonly known as a “hunger pang”), the weight of the motivation must be adjusted in real time, as would happen with any real human being. Both these criteria are pivotal to the robustness and believability of the ASM.

Finally, the third stage is the translation of the combination of weights (carried out in the previous stage) into a new function. In a way, if the previous stage represents a “vote” between motivations, this stage represents the “verdict” of such an exercise. However, this final result will not be a precise directive towards any action. Rather, it'll be a tendency towards a number of different actions, where some have a higher percentage to be carried out than others. Following the example given in the last two stages, if hunger weighed in heavily in the second phase, the final “verdict” of the third stage will place a high percentage of choice towards actions that directly counter this need (in this case, eating). Notice, however, that depending on other percentages, the way the character goes about fulfilling this need may be different. For example, if the character is responsible for feeding another character (such as a child), it might decide to cook a meal instead; as stated before, the highest percentage won't precisely choose the character's next action, instead working in conjunction with other high percentages to map a course of action that covers as many dire needs as possible (notice that smaller needs can, and usually are ignored in the process, as commonly happens with real human beings).

Finally, Dujardin and Routier postulated a series of rules regarding character motivations that should affect every character, regardless of motivation. Specifically, they authors believe there are a number of processes that are an inherent part of any human being's logic, five regarding the character itself, and two regarding the environment around it; as such, these were weaved into the ASM for every character as interfering factors, spread out across the three stages of decision-making (stated above). The five rules regarding the internal dimension of the character are the following:

- The long-term goals of the character should also weigh in during the decision making process. In other words, while human beings are usually driven by their immediate and most pressing needs, their thought process always factors in whatever long-term objectives the character feels important (save in situations where a motivation presents an extreme weight, such as urgent relief from unbearable pain).
- The motivations that are closest to a character's personality will always carry extra weight compared to the rest. While the immediate needs of the character are the main driving force behind the decision making process, a character will usually favour a path that not only leads to the supression of a need, but also that is consistent with its personality (again, the exception being cases of extreme needs). For example, a more larcenous character will most of the times feel compelled to fulfill its needs through stealing (such as stealing food when hungry, rather than buying it).
- The character will favour the actions that take the least amount of time. Notice, however, that this rule doesn't relate to a character's patience; efficiency is always a

minor motivation in a human being, unless certain slower actions present other motivation factors (such as the character having the need for fun with a certain action, or having more experience with it). In the most basic of settings, if the character doesn't lean towards any particular action, it will always choose the one that presents the most time efficiency.

    - It's our belief that this rule is mostly irrelevant: we are of the opinion that, in a human being's process of decision-making, the slightest motivation towards any direction trumps the “need for efficiency” (unless, of course, this need is part of a person/character's personality, in which case it's covered by the second rule).

- Momentum influences the choices a character will make based on the actions it has just performed. In other words, a character's behaviour shouldn't wildly change during a sequence of actions; while factors may change at any given time, a character will usually lean towards actions that are consistent with the general direction of the process. Notice, however, that if a factor shifts the motivation weights dramatically enough, it can lead the character to change its mind and choose a completely different course of action.
- Finally, a character should feel more inclined towards actions that fulfill more than one goal. If a certain action covers more than one need, even if it does so less efficiently than other actions, it will carry more weight than the rest.

The two external rules, as stated above, relate to any outside factors that usually influence a character's thought process, no matter what the character itself might be. According to the authors, those rules are as follows:

- Every character should have a sense of opportunism, favouring actions that involve closer targets. For example a character might choose to eat an apple instead of an orange merely because it has no oranges in the immediate vicinity (notice that, in this example, if the motivation to specifically eat oranges is high enough, it might trump this rule).
- A character should also tend to choose actions that don't require it to move great distances. While this is specially true for immediate needs (which take more time to be fulfilled if the character has to move a great distance to do so), it's an influencing factor in all decisions.

Another interesting study we came across during our research was the work of M. Cavazza (2002). This author studied how the interaction between characters could be used to create a self-writting narrative. In other words, the author programmed a behavioral pattern for a series of virtual characters so that they could create a story themselves through their interactions with each other.

Furthermore, the author aimed to build the narrative in a way that allowed the user to interfere at any given time, making it an interactive experience. In other words, while the program itself mapped out a predefined storyline progression, a user could actively alter its direction at any point. This could be achieved either by giving direct commands to the characters (such as where to go or what to do) or by changing the layout of the environment (such as hiding or moving objects within it). The characters would then react to these changes, altering their predefined actions and ultimately changing the story itself.

The project itself consisted of an interactive 3D animation that would map an aforementioned storyline (as stated above) and carry it out in real time. The users could then interact with it either by directly navigating through the 3D environment using normal game controls, or by verbally giving commands to the characters using a speech recognition system.

As for the characters themselves, the author defined a goal for each, which would then affect their actions. Specifically, each goal would be divided into several sub-goals leading to it, while each action would, in turn, strive to achieve these sub-goals:

Decomposing a plan into subgoals reflects an action's different stages, while the lower layers of the plan decomposition correspond to various ways to achieve these goals. For example, if the character Ross wants to ask out Rachel, then he must acquire information about her, gain her friendship, find a way to talk to her in private, and so forth. He faces several possibilities at each stage—for example, to gain information, he could steal her diary, talk to one of her friends, or phone her mother. These various possibilities correspond to subgoals in the description of Ross's plan, which can be further refined in the plan representation until they can be described in terms of terminal actions (that is, elementary actions carried out by the characters).[15]

Verily, the characters are the main focus of the narrative. According to the author, placing an emphasis on the characters' behaviours as the driving forces behind plot advancement (rather than environmental factors) greatly helps the interactive aspect of the project. The author justifies this choice by stating that character-based systems "(...) allow anytime interaction, whereas plot-based systems tend to restrict user intervention to selected key points in the plot representation."[16] However, this choice presents a challenge in keeping the consistency of the story genre: while there's undeniable interest in a story having as many endings as possible, it's important to keep them in line with the overall theme of it. According to the author, the consistency in the genre helps the user understand that's going on, helping him/her decide how and when to intervene.

Furthermore, the interactive nature of this project presents, in itself, yet another challenge. Cavazza inserted a profoundly complex variable in his project by allowing the external user (player) to interact with the virtual environment in real time. As such, the programming

15 Character-based interactive narrative. Cavazza, M. (2002). - p.17

16 Character-based interactive narrative. Cavazza, M. (2002). - p.20

protocols related to the characters' behaviours had to incorporate measures to deal with these sudden changes in the story.

As the story develops, some player interactions might force the character to radically change its original plans. Since most actions lead to situations relevant to the narrative, it's imperative to make sure these are logically in line with the plot itself. For example, a character might be instructed by the player to talk to another character it has just finished a conversation with; both characters need mechanisms to "remember" their previous conversation, as well as update their perception of each other based on what was said. If, in a previous conversation, a character was offended by a remark, it needs to act accordingly during this new conversation (such as acting angry or hurt). In Cavazza's own words:

"These interactions constitute a bottom-up approach (because plan-based behaviors don't account for these situations) and thus create a need for two specific mechanisms: situated reasoning and action repair."[17]

These two fundamental mechanisms, situated reasoning and action repair will be tools avalible to a character to deal with the aforementioned "player-enforced" changes in the environment.

Firstly, situated reasoning deals with the discrepancy between the new environment (now changed by the player's interference) and the one expected by the character (before any changes). In a way, this tool will force the character to be aware of any changes in its surroundings, forcing it to change its course of action depending on them. The author exemplifies this occurence using two of his characters, Ross and Rachel; Ross's main goal in the story being to court Rachel:

"One example is Ross meeting Rachel by accident while he is still at the early phase of his plan (...). He can choose to talk to her or hide from her, but he can't, from a narrative perspective, walk past her without any interaction."[18]

On the other hand, action repair is the mechanism that allows the character to remake its plan in real time, based on whatever sudden changes happened in the surrounding environment. For example, if an object is removed by the player, any action that involves said object is now impossible to carry out by the character. Situated reasoning would plan a new course of action that doesn't need that same object. However, if that same object is unavaliable at a certain time (such as it being used by another character), the character can merely wait until it's avaliable again, merely delaying its planned action. These slight shifts in a character's planned actions are the ones controlled by the action repair mechanism.

17 Character-based interactive narrative. Cavazza, M. (2002). - p.20

18 Character-based interactive narrative. Cavazza, M. (2002). - p.20

The existence of all these variables, both intern (character behaviour) and extern (user interaction) resulted in countless combinations of situations and reactions, which, in turn, formed a multitude of different stories.

Yet another study that we found relevant to the area of character behaviour was F. Kistler's analysis of non-verbal body language applied to virtual characters, focusing specifically on cultural gestures. In other words, the author studied various different cultures, isolating noteworthy behaviours (such as acceptable intimacy, personal space, hand movements, etc.), and then tried to transfer those to a working system of variables; the objective of this exercise being to program specific cultural behaviours to virtual characters.

According to the author, while the verbal and non-verbal behaviour of virual characters has experienced remarkable advances over the years (due to both videogame technology and creative develeopment), the appearance and behaviour of videogame characters usually doesn't stray far from those of their designers. In other words, most character designers lack the ability to develop characters outside of their cultural range. The result is, while most videogame characters fit well within the cultural setting they were designed in, they somewhat lose this ability when presented to another culture. The author also states that, even though videogame character development has been taking steps towards cultural diversity, this phenomenon is still in its infant stages, and most cultural-specific character behaviours (particularly non-verbal ones) are not yet natural enough, creating somewhat of an awkward experience for the player.

In his work, Kistler expresses the belief that gestures are the foundation of a culturally defined behaviour in a character. He states that each culture has its own repertoire of non-verbal forms of communication, not just confined to gestures, but also covering poses, acceptable distances or intimacy and so forth. Furthermore, Kistler also stresses the importance of context in some cultures, separating these into their own segment of high-context cultures (as opposed to low-context). In the author's own words:

“In high-context cultures, messages and symbols are hard to interpret without consideration of the context, which includes, among other things, a person’s social status and background, while in low-context cultures, symbols and messages are direct and to the point. As a consequence, gestures in high-context cultures are more implicit and more formal compared to gestures in low-context cultures.”[19]

On the other hand, the author also points out the role of performance of any given gesture in a culture. Simply put, how the expressiveness of a gesture might be considered engaging in some cultures, while inappropriate in others.

19 Natural interaction with culturally adaptive virtual characters. Kistler, F. (2012). - p.39/41

Kistler goes on to reference previous studies that led to relevant conclusions in the area. Namely, that human beings have the tendency to treat humanoid animations as real agents; a phenomenon that doesn't take place when faced with non-humanoid characters. Another conclusion reached by these studies is that gender also plays a role in the human interpretation of animated behaviour: specifically, female viewers tend to respond in a more sensitive manner to gaze and spatial behaviours while male viewers are mainly oblivious to them. While these studies don't cover the specific area of cultural behaviour, Kistler points out their relevance as examples of exercises where virtual worlds successfully provided an environment for studying human behaviours and interactions; therefore justifying the author's choice of a virtual setting to carry out his own study.

Firstly, Kistler implemented a model to categorize different types of gestures (from postures to hand movements and anything in between), so as to better analyze each behaviour. This model would help collect every relevant piece of data in a given behaviour, such as social context, as any behaviour analysis would be incomplete without it (as earlier mentioned by the author):

- "1. Static postures: They describe specific relations between the tracked joints, and consequently the configuration of a part of the skeleton. They are directly read from the current joint coordinates in every frame. Examples are "lean forward", "hands above the head", and "arms crossed".
- 2. Gestures with linear movement: They describe a linear movement with a specific direction and speed of one or more joints. They require the calculation of the movement between the frames. Examples are "left hand moves right" and "hands move up".
- 3. Combination of postures and linear movement: They consist of a set of static postures and/or gestures with linear movement of 1 and 2 that are combined according to specific time constraints. This means that each specific gesture or posture has to endure at least for a specific amount of time, and there is also only a limited duration allowed until the next gesture or posture starts. Instead of only one posture or gesture, there can also be required a set of them in parallel which forms one state of a recognition automaton (...). The time constraints and the arrangement of the states result into the transitions of the automaton. In this vein, we can, for example, recognize waving as "hand over shoulder, alternating moving left and right" or walking without moving with "knees alternating up and down".
- 4. Complex gestures: Gestures of this category require a more detailed shape analysis by tracking one or more joints (mostly the hands or the shoulder to hand vector) over a certain amount of time."[20]

20 Natural interaction with culturally adaptive virtual characters. Kistler, F. (2012). - p.43

Kistler then proceeded to test this theory in practice, resorting to the Virtual Beergarden scenario of the Advanced Agent Animation (AAA) application as a virtual setting for his characters. This would allow any given user to navigate a virtual space observe the interactions between artificial characters, each displaying behaviours pertinent to a specific culture, or even interact with the characters themselves.

The author uses the system's parameters to program the different aspects of each culture's gestures into the characters, such as speed and expressivity. For example, a gesture can be made wider to create the illusion of a more open cultural behaviour. Likewise, the acceptable distance for each culture can also be programmed into a character's behaviour by manipulating spacial and orientation preferences. For example, certain characters might seek spacial proximity with others when carrying out a conversation, while others might feel culturally compelled to keep their distance. These values range within a minimum and maximum distance of comfort for each culture, so that two characters of different cultures find a common distance when interacting with each other.

"Taking these aspects into account different cultural profiles can be generated that resemble prototypical behaviors of different cultural backgrounds."[21]

21 Natural interaction with culturally adaptive virtual characters. Kistler, F. (2012). - p.44

2.2.2.2. Character Development from a Creative Standpoint: Within and Without Videogames

While our research has shown that the subject of character development for independent videogames seems to have not yet been tackled from an academic perspective, it did yield a multitude of studies in the area of character development for mainstream videogames. While we believe this area to be different from the independent frameset, we deem it, nontheless, very useful for understanding a few key concepts about the videogame in general as a way of conveying a story.

In his studies, Lee Sheldon writes about character development in this specific market, as well as how to approach the different dimensions of it: physical, psychological and sociological. According to the author, most videogame developers stop just after the first, merely confering upon the character a few outward aspects that serve its purpose in the story (such as a muscular frame for a strong character) without worrying about how these aspects can work with the other dimensions or how they may affect them (a strong character, for example, might be more prone to violence).

This leads us to the second dimension, the psychological nature of the character. As the name implies, this dimension encompasses a character's way of thinking, from its attitude to its fears and beliefs. Sheldon stresses the importance of letting the character's actions convey its psychological nature, instead of just having it explain how it feels:

"Characters who explain themselves are not only boring, but not true-to-life. We writers know a secret. Even the most self-centered of human beings knows less about himself than he may think."[22]

Thirdly, the sociological dimension encompasses the character's background: where it was born, its upbringing, its cultural setting and so forth. Past experiences, both positive and negative have a huge weight on how a character thinks and acts; fleshing them out and letting them bleed through a character's acting will make it seem more real and relatable. A character who's afraid of fire, for example, will be all the more believable if this fear is fueled by a negative past experience with fire (such as being burned as a child).

While we agree with the author's take on the importance of these three dimensions, we believe his take on videogame designers not following them to be slightly outdated: during the years that followed this particular study of his (2004 onward), the videogame industry has seen immense strides in narrative. In the present time, we've seen videogame characters grow more and more lifelike as videogame designers started investing more work into fleshing them out, not only physically, but also psychologically and socially.

22 Character development and narrative for games. Sheldon, L. (2004). - p.38/39

Sheldon's take on a character's development doesn't stop at how to build it. The author also proceeds to analyze the evolution of the character as the game progresses, believing that a character must constantly undergo transformations. As Sheldon himself states, "(...) major characters, whether PC or NPC,must, like sharks, keep swimming or they will die."[23]

The author then proceeds to postulate how the whole process of a character's gradual transformation works, dividing it into two fundamental dimensions, growth and development.

- Growth relates to how a character changes as it progresses through the story. In other words how a character's traits are affected by what's happening to it. Following the previous example, a character that fears fire might overcome this fear as the story advances, simply because it must do so to succeed and/or survive.
- Development, on the other hand, relates to how much of a character is disclosed to the player as the story moves forward. A great way to evolve a character is to hide some of its traits, only showing them when they become relevant to the story. In other words, it's always better to have the player get to know the character over the duration of the plot, rather than simply giving him/her all the information upfront. For example, a player might not know a certain character is afraid of fire until a situation arises where that same character is faced with it.

Finally, the author reflects on the different roles avaliable to a character within the videogame, from a playability/story perspective. This exercise consists in dividing the characters into Player Characters (PCs) and Non-Player Characters (NPCs), as well as understanding the fundamental differences between each. A PC is the most important character in the game, as it represents the player, allowing him to interact with the game environment. As such, the story will always revolve around this character, making it the most important to develop and flesh out properly. A player must feel deeply connected to this character in order to stay engaged, so it's paramount that it's deep, tridimensional and relatable from an empathetic standpoint.

NPCs, on the other hand, are all the game-controlled characters that populate the videogame environment. While the PC is the center of the story, these characters are the ones who move it along, helping the PC, giving it quests or antagonizing it. They also help humanize the PC, as an important part of its personality will definately stem from how it deals with other characters, be them friends or foes. Furthermore, by proxy, the way the PC relates to these NPCs will bleed through to the player himself/herself, making him/her develop his/her own emotions towards these characters (such as emulating the PC's hatred for the main villain, for example).

Widening the spectrum of character development to the area of literature, we find Christopher Vogler's studies on character archetypes; the author proposes a series of predetermined roles

23 Character development and narrative for games. Sheldon, L. (2004). - p.41

that fit all the characters in the hero's journey. According to the author, as a story progresses, the characters' personalities are constantly dividing themselves to fill these roles. Vogler defends that these roles supercede the fictional nature of a story; rather, they reside in the collective unconscious of the human mind, bleeding into every story we write. As Vogler himself states:

"The repeating characters of world myth such as the young hero, the wise old man or woman, the shapeshifter, and the shadowy antagonist are the same as the figures who appear repeatedly in our dreams and fantasies. That's why myths and most stories constructed on the mythological model have the ring of psychological truth."[24]

As for the archetypes themselves, Vogler deems the following seven the most common:

1. Hero: As the main archetype, the hero's purpose is to provide the audience with a shell through which to experience the story firsthand. As such, storytellers endow him with as much relatability as possible, so as to have it establish a connection with the public.

2. Mentor (Wise Old Man or Woman): This archetype exists as a supporting element to the hero archetype. Granting knowledge or tools, the mentor assists the hero in completing his mission.

3. Threshold Guardian: The characters that fit into this archetype are the antagonists set in place to block the hero's journey. Their overarching role is to test the hero's mettle and worth, rather than being his actual enemies. In fact, as the hero overcomes their challenges, they can even become allies.

4. Herald: The herald archetype represents the character (or event) that brings the main challenge to the attention of the hero. It might be a messenger carrying a missive of war, or simply a natural event that causes the hero to take action.

5. Shapeshifter: The most unpredictable archetype, the shapeshifter is usually a character whose motives are never quite clear. These characters will usually show their true colours as the story progresses (either for good or bad), but while they belong to this archetype, their objective is to keep the public (and sometimes other characters) guessing as to which side they truly belong to.

24 The Writer's Journey. Christopher Vogler (1998). - p.13

6. Shadow: The Shadow represents the antagonistic energy in the story. Usually not associated with any specific character, the Shadow is most of the times just the element of evil itself. It lurks within every character (moreso within villains, naturally), and is, in a sense, the true enemy in the story.

7. Trickster: The trickster archetype embodies all that is mischievous and inconstant. Often the characters associated with this archetype are defined by their silly antics, providing comic relief as the plot advances.

2.2.3. Narrative in Videogames and Other Media

As previously mentioned, the videogame stands as a *medium*, capable of telling a story; however, like all other media, the videogame possesses quite a few variables of its own, making it a very peculiar tool of narrative. The simple fact that a player is (in most cases) allowed to choose his/her own path, forces the storyteller to build a videogame plot in a completely unique way. For example, Crixel, points out this aspect of videogame narrative in his work. Using the videogame "Wizard 101" as a reference, the author reflects on the player's intervention in the storyline, both while playing and while reseaching on gaming communities.

Crixel begins at the same premise stated above, by reflecting on the difficulty of adding a plot to a world where players can choose their own path. Plot elements might be experienced in a different order by the player, or even skipped altogether, depending on the choices he/she makes. The author chose to single out the videogame "Wizard 101" as an example of a way to circumvent such narrative hardships: in this particular videogame, the designers broke down the overarching plot into several smaller subplots, weaving them into quests. The result is, while the player advances through these quests, the story unfolds. According to the author, knowledge of a story's structure and rhythm is crucial for game designers, as it helps them find solutions for these obstacles (like the one stated above).

L. Sheldon, already referenced in the previous chapter, studies this phenomenon extensively in his book, postulating a series of techniques and tools for videogame narrative. The author tackles the subject by dispelling the misconception that, since the player is an intervening agent in the plot, it should be linear so as to remain solid. Notice, however, that the author, admits to the fact that, in a way, progression in any videogame is always a somewhat linear experience:

"Every time a player moves from level to level in an action game, she is following a linear path. In fact, in the strictest sense, each game experience is linear because the player makes only one set of choices on what to do. Let's say a player reaches an obstacle she can't get past, so she backtracks in the level to find something that will help her: a hint, an item, or another obstacle that must be overcome first.[25]

25 Character development and narrative for games. Sheldon, L. (2004). - p.167/168

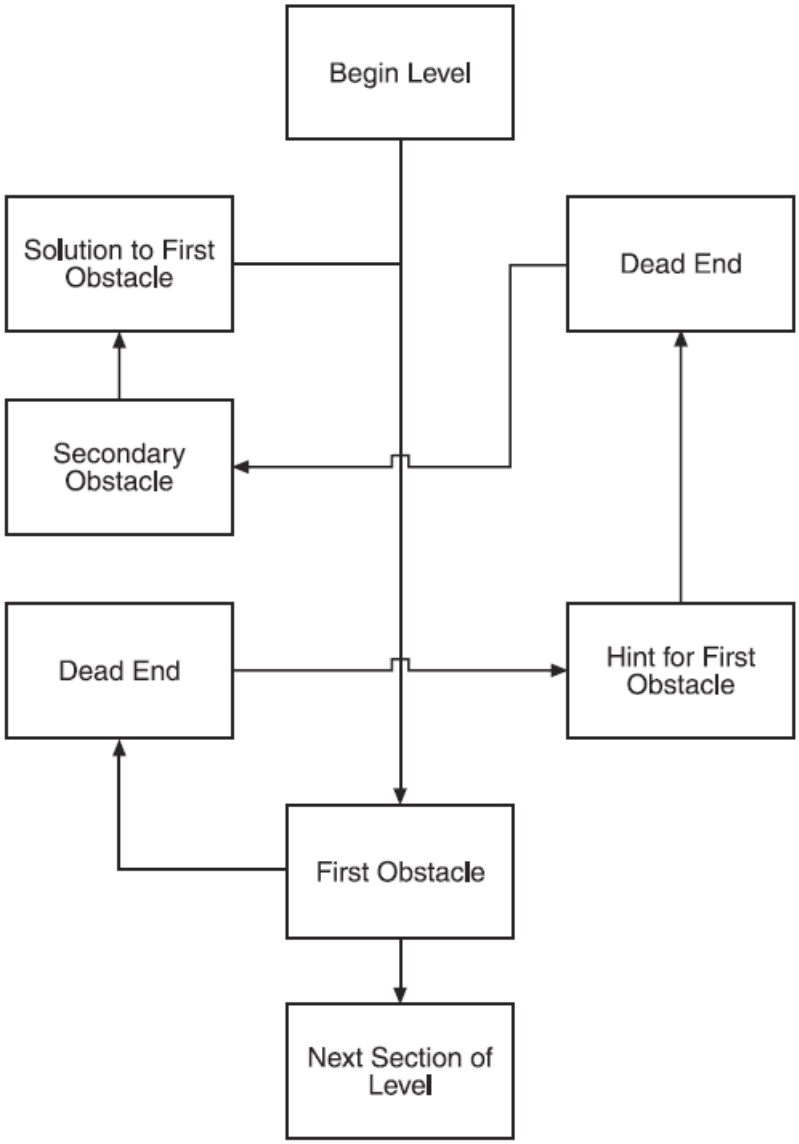

Fig. 2. Linear Experience in Non-Linear Space.

[26]

However, the gameplay itself can be as non-linear as the game designer wishes. A player might be offered a choice between different paths, or even to backtrack. In fact, many games use these changes in the direction of the plot to create the illusion of non-linearity; at its core, the player is still making linear choices, but under the simple multitude of the choices avaliable to him/her (even if it means only two or three), makes the plot itself non-linear.

---

26 Character development and narrative for games. Sheldon, L. (2004). - p.167/168

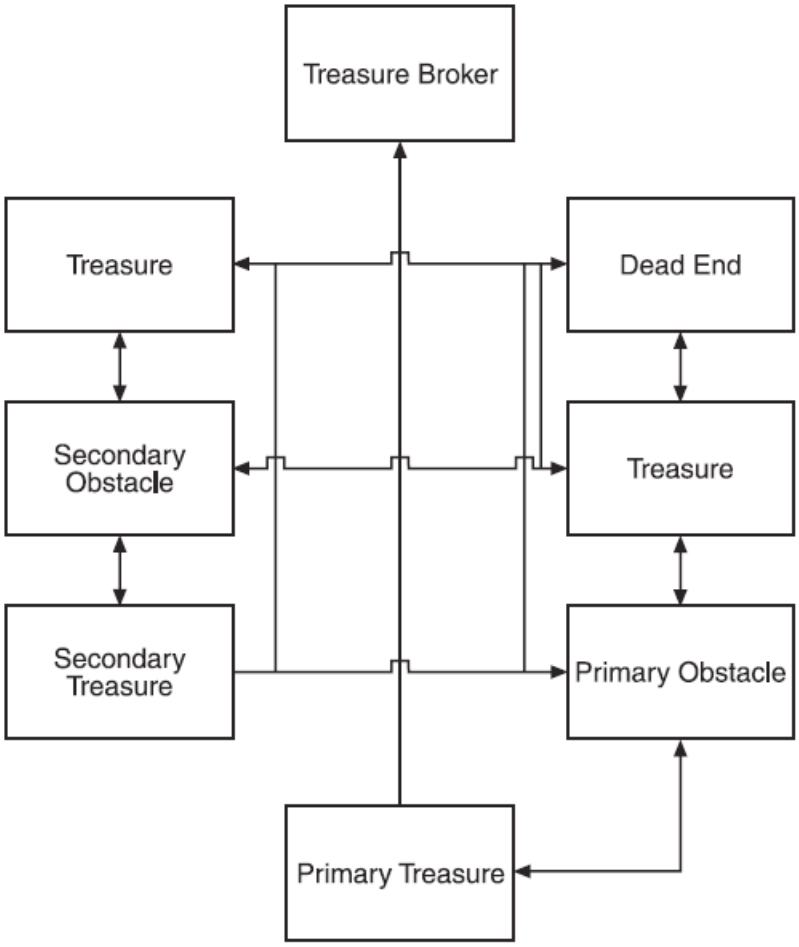

Fig. 3. Non-Linear Gameplay

[27]

Another interesting aspect of videogame narrative tackled by Sheldon is the use of cutscenes, as well as the inherent dangers of using such a tool. According to the author, while a cinematic break in the game might be useful to draw attention to some important event or character, it might also break the rhythm of the gaming session, severely hurting the engagement and immersion of the player (among other hazards). Cinematic sequences, while visually appealing, can be heavily detrimental to the videogame's playing experience. According to the author, a cutscene carries heavy weaknesses that must be weighted by the designer when choosing to use one:

27 Character development and narrative for games. Sheldon, L. (2004). - p.168

- Firstly, a cutscene requires the player to disengage from an active position (playing the game) to a passive one (watching the cinematic sequence). This aspect is, more often than not, hazardous to the experience of engagement.
- Secondly, cutscenes tend to have better graphic quality than the game itself, due to their pre-rendered nature. This hampers the aesthetic experience of the game itself, making it inconsistent. Notice that this issue can be circumvented by recording cinematics in the game engine itself, sacrificing some of the quality in exchange for visual homogeneity.
- Lastly, if a game designer relies too much on cutscenes, it will stifle creativity as far as other ways to tell the story are concerned. If cutscenes are overused, they become crutches, preventing the designer from finding more creative ways to convey the plot and ultimately damaging the videogame's originality.

As was the case with our research into character development, we also touched upon studies narrative with a focus on literature, since we believed them to be pertinent to our work, regardless of their chosen *medium*.

For example, in “The Hero with a Thousand Faces”, Campbell postulates a logic sequence to the path of the hero, a model which can easily fit into any plot; this is specially true for videogame narrative as it's almost exclusively centered around a hero character and its journey. According to the author, the journey is divided into three major points, Departure, Initiation and Return, each being further divided into sup-points. For the purposes of our study (and the story we intend to build as a part of our final project), we've isolated the most relevant:

1. Departure
    - Call to Adventure: As the hero starts out its existence in a safe environment, it takes an outside element to reach out to him and nudge him towards the unknown. Usually a coincidence, this element is often a problem generated independently from the character itself, but that requires something to be done about it. An example of this would be a roaming warband that endangers the village where the hero lives.
    - Refusal of the Call: Often the hero eschews the call before him at first. While the hero will eventually rise up to the challenge, sometimes the problem has to personally affect him in order for him to find the motivation to set out into the unknown. Following the previous example, a hero might avoid dealing with the warband until it actually attacks the village and kills the people closest to him.
    - Supernatural Aid: As the hero accepts his mission, he usually finds assistance in a protective figure (such as an old man or a deity). This new element, while unable to directly deal with the challenge, can direct the hero towards it, granting him boons, both material and otherwise. In the ongoing example, this element could be

an aged swordsman that, while too old to fight the warband himself, can train the hero to carry out his mission.

- The Crossing of the First Threshold: The First Threshold is a metaphorical representation of the limits of the known world from the hero's perspective. In other words, as the hero sets out in his adventure, he'll soon come across the farthest point he's ever been from home; from that point forward stands the unkown world he must brave in order to complete his adventure. Following the example in question, this point could be the outskirts of the village, just before it's out of sight.

2. Initiation
    - The Road of Trials: Having crossed the threshold, the hero must now overcome a succession of trials as he traverses the unknown. These trials will build up until the hero reaches the ultimate challenge, the one he set out to complete in the first place. In the ongoing example, this last climatic trial could be the leader of the warband.
    - The Gift of the Goddess: As the hero successfully completes his last trial, he is rewarded for his efforts. This reward might be tangible, intangible or both. Either way, it's the vindication of the hero's journey, the yielding of the unknown's treasures to him. Following the ongoing example, the hero's reward for defeating the warband could be something immaterial, like the newly reinstated safety of his village, or material, like the treasure plundered by the defeated warband.
    - Atonement with the Father: As the hero claims his reward, he finds himself changed from what he once was. The trials presented by the challenge, both physical and psychological, have tempered his personality, turning him into something better. Having conquered the unknown, the hero is no longer afraid of it. In the previous example, the hero would now no longer be confined to his village, having found the courage to brave into the unknown.

3. Return
    - Refusal of the Return: Having a new comprehension of the uknown world, it is now the hero's duty to bring that knowledge (along with any boons acquired) back to the point he started from. However, there might still be a refusal of this duty: for any given reason, personal or otherwise, the hero might feel compelled to continue following the unknown world. In the ongoing example, the hero might not want to return to his village because of the painful memory of the people he lost to the warband.
    - The Magic Flight: Having overcome his refusal to return, the hero now rides back to the home he left behind, triumphant. Some minor trials might be weaved into this phase, but these are usually trivial, as the hero has already conquered the

unknown world. In our example, a trivial trial could be presented by leftover bandits, trying to avenge their leader.

- The Crossing of the Return Threshold: At first glance, this phase is very similar to the Crossing of the First Threshold. However, the differences in the hero's personality, make this new phase relevant: as he crosses the threshold back to his home, the hero reflects on all he gained and lost during his adventure, specially on how it changed him. Following our example, the hero could reflect on how his journey made him a stronger fighter, or how the memories of the people he lost to the warband are now at peace.
- Master of the Two Worlds: The hero is now a supernatural being, having traversed the unknown and returned. His doubts and fears have dissipated and his world is no longer bound by the aforementioned thresholds. He's now seen with admiration by his peers. Closing our example, our hero finally returns to his village, being received with admiration and praise by his fellow villagers.

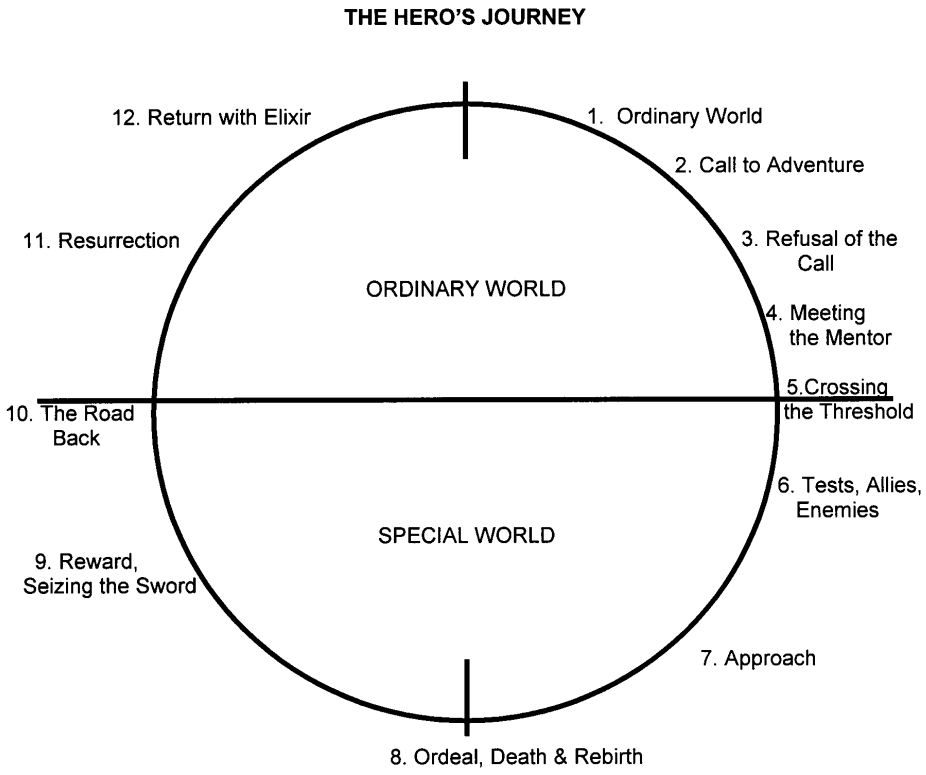

Fig. 4. Schematic of Campbell's journey of the hero.

28

28 Image collected from the website *http://www.thewritersjourney.com/graphictwo.gif*

In “Morphology of the Folktale”, Vladimir Propp also proposes a structure for the journey of the hero. Firstly, according to the author, an initial situation must be set before a story takes place. This is where the future hero is introduced, as well as the environment around him, including any characters relevant to him (such as family and friends). In a sense, Propp exalts the importance of setting as a way to flesh out the main character's background before thrusting him into adventure.

Propp then divides the plot in several different steps. We've noticed how close these steps are to Campbell's phases, which undeniably defines Propp as an important reference in Campbell's work. Again, for the purposes of our investigation, we've isolated the most relevant for videogame narrative:

1. Mediation: The hero takes notice (or is warned) of an impending danger or problem. This is his first contact with what'll be the main focus of his adventure.
2. Beginning Counteraction: The hero debates whether to deal with the problem or not, depending on what obstacles (real or psychological) might hold him back.
3. Departure: The hero leaves home and starts his adventure.
4. The First Function of the Donor: The hero's worthiness is tested before he receives a boon to help him in his mission. This might be a challenge by a mentor to ascertain if the hero deserves his help.
5. Provision of a Magical Agent: The hero is presented with the boon mentioned in the previous step. This might be the knowledge of a mentor or something more tangible, like a weapon or a relic.
6. Guidance: The hero is guided to his objective, either willingly or unwillingly, travelling to the core of the problem.
7. Struggle: The hero faces off against the core of the problem. An example of this would be the climatic fight between the hero and the villain.
8. Marking: The hero is wounded by the Struggle; defeat seems imminent by this turn of events.
9. Victory: The hero turns his disadvantage around and manages to achieve success, overcoming the challenge.
10. Resolution (*own term*): The problem is solved: balance/peace is restored.
11. Return: The hero returns triumphant to his home.

Finally, Christopher Vogler, while also proposing a structure for the hero's journey (based on the works of the previous authors), also proposes seven character archetypes: these, while not rigidly set in stone (a character can fill more than one, for example), present a very solid basis for any story. Vogler begins with the statement that the hero's story is always necessarily a journey: this might be an outward journey (to a dungeon, castle or forest filled with dangers)

or an inward one (through the hero's mind). According to the author, “In any good story the hero grows and changes, making a journey from one way of being to the next: from despair to hope, weakness to strength, folly to wisdom, love to hate, and back again. It’s these emotional journeys that hook an audience and make a story worth watching.”[29]

Vogler then divides the aforementioned journey into the following stages. While similar to Propp and Campbell's exercise, we believe Vogler's structure to be the most suited to the videogame narrative:

“1. Ordinary World

2. Call to Adventure

3. Refusal of the Call

4. Meeting with the Mentor

5. Crossing the First Threshold

6. Tests, Allies, Enemies

7. Approach to the Inmost Cave

8. Ordeal

9. Reward (Seizing the Sword)

10. The Road Back

11. Resurrection

12. Return with the Elixir”[30]

The similarities between Vogler's theory and his predecessors' are evident: the journey starts within a safe, ordinary and known environment (world), where the hero resides. He/she is then the recipient of a “higher calling”, be it from within (wanderlust, desire for glory, etc.) or without (deity, village famine, etc.), which he/she might initially refuse until sparked into action by an outside circumstance. The hero then meets a wise ally (mentor), who helps him/her with knowledge of the perils ahead and how to face them. The hero must then cross te limits of the known and venture the dangers of the unknown world, where he/she will face various tests, until reaching his/her final destination (the lair of the main villain, for example). The hero must then overcome the major trial and claim his/her reward before returning, triumphant and enriched (materially or spiritually) home.

29 The Writer's Journey. Christopher Vogler (1998). - p.13

30 The Writer's Journey. Christopher Vogler (1998). - p.14

2.3. Outstanding Works in the Videogame Industry from a Narrative and Character Development Perspective

Although still only coming out of its early stages, the videogame industry has experienced massive growth over the last thirty years. As the technology and popularity of the products in this area increased, we've witnessed a proliferation of artistic works; some of them displaying what are widely regarded as some of the most well written stories and empathetic characters in any entertainment *medium*. In this chapter we will look at some of those examples of good game design, not only in the area of mainstream videogames, but also (and more importantly) in the independent industry. This analysis, however, will focus only on narrative and character development, eschewing other more technical but less relevant aspects (such as the graphics engine, for example).

2.3.1. In the Mainstream Industry

Videogames in the mainstream industry are the most well-known by the public, as well as the most profitable. Similar to the cinema industry, for example, the mainstream videogame industry has a well established system of multi-million companies, developers, distribuitors and franchises, some almost as old as the industry itself.

The potential for profit in this area also makes it the most invested on, causing the vast majority of technological advancements to be debuted by major consoles (such as the motion technology on the *Nintendo Wii*). On the other hand, it also makes it the most prolific, with hundreds of different games being released every year over various different gaming platforms.

Among these works are some which are widely acclaimed by the gaming community as masterpieces, either because of their gameplay, technological advancement or visual/narrative creativity. This last aspect is possibly the most important, as it creates worlds and characters that can then be revisited in other games, both in a future setting (sequels) or in a past one (prequels). In fact, as our research made clear through the following examples, at the core of each successful franchise, there's a solid story or character connecting all the game titles.

2.3.1.1. Prince of Persia: the Sands of Time

Based on the videogame franchise created by Jordan Mechner in 1989, *Prince of Persia: the Sands of Time* represented a revival of a series that had been losing fans over the years, despite its first instalment (Prince of Persia) being one of the most successful videogames of all time. Released in 2003, and the first title since the studio *Ubisoft* took over the franchise, *Sands of Time* proposed a new way of narrative never before seen in the industry, one that managed to weave a rich plot into gameplay without interrupting the experience of immersion and engagement for the player. According to IGN, one of the most credited gaming sites on the Internet:

"The title features a very intelligent, thoughtful presentation. Prince's story is told through a variety of crisp, ambient full-motion video cut-scenes and witty in-game dialogue. The character talks to himself, yes, and he even acknowledges this oddity sometimes, which is amusing. This direct method of narrative works tremendously well because it never breaks us from the action. Plus, because the story often unravels from the very lips of our hero, we always know what he's thinking and feeling and it makes him more real and more likable."[31]

Another interesting aspect is the main character itself. Uncommonly for its time, *Ubisoft* presents us with a main character that's neither a perfect hero nor one devoid of personality (a common mistake on videogame characters). The Prince, as the character's called, is arrogant, conceited and haughty, traits we infer from the countless narrations he provides us of his story while playing. In fact, *Sands of Time* weaves an uncommon story in the fact that the hero's shortcomings are themselves the cause of all the troubles he must face:

"(...) it's this ambition that starts all of the trouble. The game begins in medieval Persia shortly after the Prince and the king have defeated the Maharajah and looted his palace. When the Prince takes a mysterious dagger he accidentally unleashes the Sands of Time, an evil force that infests the kingdom and transforms its inhabitants into demonic beings. The character's quest is, ultimately, to set right his own mistake and reverse the dark magic."[32]

However, the depth of the main character isn't the only outstanding creative element in the *Sands of Time* story. As the name itself implies, the unleashed sands have the power to control time, a power that's explored in the story as well. First of all, as the Prince, the player is given

31 Prince of Persia: The Sands of Time: This is how you make a sequel. Matt Casamassina (2003). (avaliable online).

32 Prince of Persia: The Sands of Time: This is how you make a sequel. Matt Casamassina (2003). (avaliable online at www.ign.com).

a certain control of time, being able to rewind a few seconds when falling into a trap or being hit by an attack. This represents not only an extremely fun gameplay element, but also a pertinent narrative aspect, as time travel and manipulation is central to the whole storyline. In fact, the narration we hear from the Prince from the very beginning of the game, is set in a future time; upon finishing the story, we arrive at that time, closing the temporal loop in the plot and understanding why the Prince feels the need to narrate his adventure.

In short, the circular nature of the story, playing on themes such as time paradoxes, coupled with the believable depth of the main character, make this game one of the most acclaimed works of narrative in any entertainment *medium*. As such, it comes as no surprise that this game was immensely successful in its time.

Fig. 5. Prince of Persia: The Sands of Time - gameplay footage.

2.3.1.2. Legend of Zelda: Majora's Mask

The last instalment of the *Legend of Zelda* series to be released for the *Nintendo 64* gaming platform, *Majora's Mask* pushed the boundaries of an already well-established and profitable franchise. Well known for their interesting storylines, the games from *Legend of Zelda* series dated back to 1986, with each title being met with great success by the commuity, not only up until the year 2000 (when *Majora's Mask* was released), but even until the present day, as the franchise is still active. However, what we believe makes this title stand out from the others is its unique way of narrative. According to IGN's review:

"Link's new journey begins where The Ocarina of Time left off. After he rid Hyrule of evil he decided to set out on a quest that would benefit him. He went searching for an adored friend whom he set apart from when his legacy turned legendary. In the middle of this journey Link stumbles into a mysterious new land named, Termina (...). Through word of mouth, Link hears that Termina is in peril because the moon is unmercifully crashing down towards the earth leaving only a matter of days before the land breathes its last breath. On this new territory Link is riding his young steed through a thick forest, when two fairies scare his horse throwing him to the ground leaving him unconscious. It turns out the two fairies are working at the hand of an evil masked thief and all-around troublemaker. Link awakens angered to find them toying with his Ocarina of Time, which was given to him by Princess Zelda. This masked villain steals Link's horse and eventually curses Link himself. This is where the story begins and just three days -- 72 Hours -- later it will end if you don't halt the moons death march towards the land of Termina. Link isn't sure where this disguised troublemaker fits in, but the end of the world awaits if he doesn't vow to help these people."[33]

As the author states in this review, the plot revolves around a timed event, giving the player 72 ingame hours (the equivalent to 54 minutes in reality) to traverse a whole world and avert disaster. Naturally, this is an impossible task; however, upon retrieving the aforementioned "Ocarina of Time" near the beginning of the game, the player then has the opportunity to go back in time to the first day over and over again by playing the instrument. However upon doing so, the player loses most of the progress made during those three days: only the few items that advance the plot can be kept.

In other words, the flow of the game varies from player to player: depending on the players skill, one might have to go back in time at each important plot point (for example, finishing one of the major enemy temples), or one can stride through many, creating a unique story for each player. This new paradigm of narrative is rare in present days at best, and completely unheard of at the time. Apart from that, *Majora's Mask* was one of the first games to

33 Legend of Zelda: Majora's Mask. The Legend of Zelda continues. Fran Mirabella III (2000). (avaliable online at www.ign.com).

incorporate events at specific times during the day/night. For example, some non-playable characters only appear during the night of the second day, and must be approached before dawn, or they'll disappear, forcing the player to go back in time to meet them again. The storyline implications of such a system at the time were staggering: one could, for example, strengthen insomnia as a character trait by having it appear only at certain hours late at night. Conversely, with the Postman (an actual character in the *Majora's Mask* world), his "early-bird" schedule and attitude is reinforced by the fact that one can only find him during the early hours of the morning. The review's author touches upon this subject in a succint way, clearly explaining how gameplay and story come together in this unique time-travelling element:

"With the Ocarina you can warp back to the beginning of the first of the three days and save your progress. The downside is that almost everything resets when you go back to the first day. You lose your money, basic items (...), and the temples reset. There are a few exceptions, though. If you get a major item like a mask or a sword you will keep this as you warp back through time and save. So, as you play the game you'll quickly realize that you have to start a temple and finish it within the given three days of time. There are a few ways to get around the 54-minute problem, however. One of the most important ones is the ability to alter time. By altering time you can turn those three days into several hours to complete a temple or side-quest."[34]

Finally, while the personality of the hero doesn't stand out too much, the world of *Majora's Mask* is populated with dozens of interesting characters. In fact, a great part of the game lies in side-quests and small missions involving minor non-playable characters. At the beginning of the game, the player is given a notebook where these characters, their wants, needs and active times of day are recorded, allowing the player to deviate from the main adventure to simply explore the world and its denizens. This fact, coupled with the many possible paces for clearing the story, give the player a solid illusion of freedom, permitting each player to complete the game at his/her own pace, and to ignore or follow as many side-quests as desired.

34 Legend of Zelda: Majora's Mask. The Legend of Zelda continues. Fran Mirabella III (2000). (avaliable online at www.ign.com).

Fig. 6. Legend of Zelda: Majora's Mask - gameplay footage.

2.3.2. In the Independent Industry

The independent area of videogame development, while a lot more recent than mainstream, has already yielded widely acclaimed works; while the budget allocation for these games tends to be low to non-existant (when compared to the mainstream industry), some of these games have risen to such popularities matching the most successful games of all time, even within the mainstream area.

We believe the source of this phenomenon to be the fact that, even with low production values, a game can still convey a story in a compelling and interesting way, given the creative writing work is solid. The following examples have stood out in this area specifically because of that same quality, accruing millions of fans worldwide in spite of their humble origins.

2.3.2.1. Limbo

Developed by the independent Danish company *Playdead* and released in 2010, *Limbo* is a simple puzzle platformer game, that has nevertheless compelled gamers worldwide. While its gameplay is elementary (limited to running and jumping in a 2D environment), its interesting puzzles and clever traps have earned it general worldwide acclaim. IGN's review on this particular game defines it as nothing short of an art form:

"Video games are an art form made up of visuals, sound, and a mysterious little something we call gameplay. Limbo is the perfect example of these three crafts working together in harmony to create something astounding. With no text, no dialogue, and no explanation, it manages to communicate circumstance and causality to the player more simply than most games. (...)

You control a young boy who wakes up in a forest with no indication of who you are, how you got there, or where you're going. You set out to explore this bizarre environment but soon find it to be a dangerous place, at which point your motivation becomes clear: you need to get the hell out of there. No cut scenes or loading screens will interrupt the action, making it easy to be swept away by Limbo's disturbing world. From beginning to end, the game never stops surprising, delighting, and horrifying the player."[35]

As stated by Hatfield in his review, the game manages to convey an enthralling sense of cause and effect, all the while urging the player forward towards understanding where he/she is and how to get out. As was pointed out by the author, the game takes the player on this journey without resorting to a single line of text, neither spoken nor written. All the information is subtly and visually conveyed, creating a mute but nevertheless fascinating story.

On the other hand, the visual aspect of the game also greatly contributes to the unique setting of the journey: unlike any other game at its time, Limbo uses a basic but mesmerizing technique of backlight to give form to its shapes, resorting solely to shades of gray for color. The result is a dark and opressive but compelling scenario that invites the player to explore more and more.

Finally, Limbo has a very interesting take on one of the most complicated gaming situations to deal with, narrative wise. Death of the playable character in Limbo is not ignored by the plot, but assumed as one of the main aspects of gameplay. According to IGN's review on this particular subject:

"(...)The developers describe Limbo as a trial-and-death game. As you make your way through the forest, you'll come across obstacles that will often kill you immediately in shockingly gruesome ways. How many times have you seen a little boy decapitated by a bear

35 Limbo Review. Hell is for children. Daemon Hatfield (2011). (avaliable online at www.ign.com)

trap? But after your death you'll restart right before the trap and get to figure out how to get around it. The game is very clever and eventually becomes quite challenging.(...)"[36]

Finally, Limbo is a perfect example of how an exceedingly short game (approximately 6 hours of play time from beginning to end) can still yield a rich and interesting story, all the while conveying it through subtle, non-verbal means. Its experimental nature makes it by far one of the most unique games we found during our research, as far as narrative goes.

Fig. 7. Limbo - gameplay footage.

36 Limbo Review. Hell is for children. Daemon Hatfield (2011). (avaliable online at www.ign.com)

2.3.2.2. Bastion

Set in a post-apocalyptic world, this “indie” RPG/Action game, developed by the independent company Supergiant Games, is defined by an uncommonly massive world for its area. Through a long and well organized process of two years, over two different developer teams, Supergiant Games managed to develop a story much longer than any other game in the independent industry.

The story revolves around an event called the “Great Calamity” that shattered the main character's world, breaking it into many small floating islands. It's the player's mission to go around these now various different worlds, restoring them to their former selves. According to the author Greg Miller on IGN's game review:

“In Bastion, something called the "Great Calamity" has rolled in and taken out your entire civilization. You awaken as "the Kid," and set off to restore the Bastion -- a spot where everyone was supposed to meet if bad stuff went down. To do this, you'll need to dive into levels, best foes, and collect shards.”[37]

While the premise of story alone wouldn't be enough to set this game apart from any other RPG (specially in the mainstream industry), it's the way the plot development is handled that make this game truly unique. Gameplay aside, the role of the sound in the game as a means of immersion and narrative is remarkable: throughout the game, the narrator keeps the player entertained by pointing out everything that's done, building a story as the game is played. On the other hand, the visual tone of the game, reminiscent of a wartercolor painting, keeps the player interested in exploring the world over and over again.

This ease of repetition was picked up by the developers by adding new layers of difficulty and challenges for the players to revisit old levels and replay them with certain gameplay limitations (such as normal attacks not dealing damage to enemies). The fact that this aspect of the game is, itself connected to the story (instead of merely a difficulty setting in the starting menu) makes the experience all the more immersive:

“(...) I even unlocked idols that made levels tougher -- made enemies unable to be beaten by normal attacks but that gave me greater rewards. All of this made me want to keep playing -- and play in different ways. Was my loadout the best? How hard could I make a level and still have it be fun? What loot would the next seemingly dead end yield? I loved coming back to answer these questions.”[38]

---

37 Bastion Review. The download everyone's talking about makes its way to the PC. Greg Miller (2011). (avaliable online at www.ign.com)

Fig. 8. Bastion - gameplay footage.

Overall, what sets Bastion apart from other independent videogames is the massive size it managed to achieve by cleverly recycling ingame elements in a way that doesn't feel repetitive to the player. The fact that the story is used as a resource in this endeavour, playing a huge part in keeping the player interested (even while going back to redo old content) show us just how much potential lies within the narrative as a supporting pilar for any successful videogame.

38 Bastion Review. The download everyone's talking about makes its way to the PC. Greg Miller (2011). (avaliable online at www.ign.com)

2.4. Conclusive Note: Contributions of the Research as a Starting Point for a Master's Degree Project

As mentioned at the beginning of Chapter 2, our research focus was divided into Engagement, Character Development and Narrative, all three areas with a particular focus on videogames in general (and independent videogames in particular). However, the contributions of the different studies towards our Master's Degree Project vary from case to case; simply put we found some of the information discovered to be of higher relevance to our purposes of developing a videogame's story and characters so as to achieve the maximum potential of engagement.

When categorizing the information yielded by our research by their differing degrees in practical application, we believe it to be pertinent to separate their contributions into two distinct categories: the studies which directly contributed to the development of the aforementioned projects and those that did so indirectly.

In other words, some of the studies analyzed, such as Lee Sheldon's book, would proceed to have a defining role in the project's development process, as we found ourselves directly applying their tools and resources to certain phases of it. The most pertinent examples of such studies were the works in the area of psychology pertaining engagement, such as Bruner's: these, while only briefly touched upon, established the concept of engagement that would then be used as a baseline to gauge the effectiveness of the techniques applied during the development process.

Conversely, Cavazza's analysis of the interaction between AI character in a virtual environment (for example) yielded a more abstract contribution to the project. While these studies can't be considered direct agents in the process of decision-making behind our videogame, their analysis in their respective fields helped achieve a more thorough understanding of the areas of Narrative and Character Development in this dissertation.

3. Dead Harvest: development of a Videogame Concept

As stated before, the objective for our final Master's Degree project was to develop the concept of a videogame, from a creative perspective. In other words, our focus was to create all the necessary assets to build a videogame, from the story itself to the characters, scenarios and animations it entails.

As such, the first exercise carried out consisted of finding a basis around which to build our story. On an fundamental level, we wanted to create a fantasy-based environment (as opposed to a science-fiction environment, for example): thusly, the research carried out during this step was eminently focused on human myths, deities and gods, as we believed these to carry untapped narrative potential.

This research would prove vital to the whole narrative and character development process, as it would define not only the main character, but also his journey. We chose to build this character based on the “harvest spirits”, pagan deities present in the European folklore (more specifically English folklore): according to the myths, these spirits would live amongst the grain, possessing the crop and promoting its growth; as the crops were reaped during harvest season, these spirits would fade into sleep, awakening once more during sowing season. As such, the reaping of the last plant was highly ritualized in pagan cultures, so as to ensure these spirits would survive until the next sowing.

An important step in these rituals was the crafting of Corn Dollies, humanoid idols made of straw that would house the spirits between seasons. These idols would later be repurposed to scare birds away from the crops, gradually becoming the scarecrows used until this day. The fascinating nature of these tales, compared to the (from our point of view) still largely unexplored potential of the scarecrow as a fictional character, led us to use them as the building blocks of our main character, Wicker.

In other words, Wicker was created as a harvest spirit, with all the limitations and powers these deities were believed to have in the pagan lore. As an ethereal entity, Wicker would be tethered to an idol (in his case a scarecrow) and would be tasked to defend a harvest, sleeping within his scarecrow every year, between harvest and sowing seasons. These two “forms”, scarecrow and spirit, would also greatly influence the gameplay, as each interacted with the world in a different way.

Having found a direction for the main character, we then proceeded to build his backstory (and subsequent ingame journey) from the motivations that would come naturally to such a creature. We knew that its connection to its harvest was a key aspect of its personality: as such, it was paramount that the concept of “home” as an entity to be protected was the main focus of this character's journey. With this, two of the three main elements needed to build a plot were assembled: a main character and an objective for it to strive towards. All that was left was an obstacle.

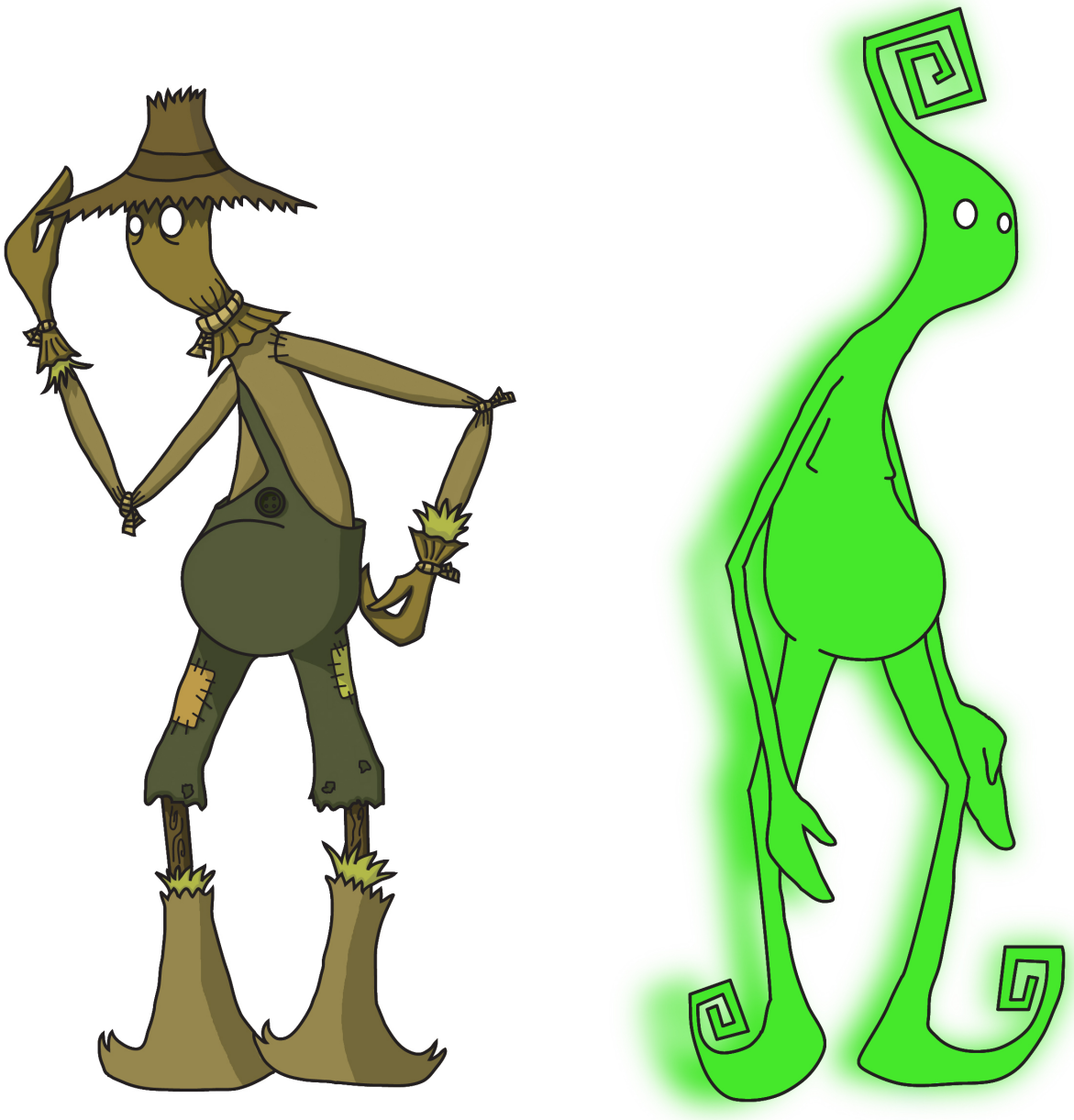

Fig. 9. Concept art for the character Wicker – scarecrow form (left) and spirit form (right).

This last element was perhaps the most complex, as we needed to develop a strong antagonistic entity to prevent Wicker from fulfilling its duty to defend the harvest. As we researched what ailments destroyed crops, we kept being led towards two natural disasters: infestations and plagues. However, while an infestation had undenyable narrative potential, we were immediately compelled to pursue the plague as an obstacle. We did so, not only because of the inevitability of such an occurence, but also (and mainly) because of the superstitious association between plague and evil as symbiotic entities. In other words, we believed that the concept of a plague with an evil intent behind it was an easy concept for an

audience to grasp, simply because it was a widespread superstition regarding any plague up until the 20th Century. As a result, we would not only have a tangible representation of evil as an obstacle to Wicker, but also we'd be able to justifiably make it span the whole world, as a disease can spread as far as it has room to grow.

Arranging all of the aforementioned elements together, we now had a main character with a solid backstory, as well as a believable motivation to set out to an adventure:

Wicker had protected that harvest for as long as he could remember. Every year, as the crop started to grow, he would awaken from his slumber to bless and protect the grain, falling asleep once more as the harvest season ended. He knew nothing of the outside world, but he was content: his crop was safe and comfortable and the unkown lurking beyond the borders of his field scared him.

However, as Wicker woke up one year, he found everything changed: the crop he was supposed to protect had withered, as had every other living thing in sight: a disease had plagued the world, killing everything as far as the eye could see. Wicker wept for the loss of his beloved harvest and vowed to do everything it took to bring it back to normal: even if it meant braving the outside world that scared him so, and finding out what was behind this mysterious plague. Terrified but resolute, he sets out into the unknown...

3.1. Decisions Pertaining Narrative in Dead Harvest

As mentioned at the end of Chapter 2, the process of decision-making within the Dead Harvest project was greatly influenced by the research conducted during that phase of the dissertation, both directly and indirectly. As we were faced with the many different challenges of developing the narrative of the videogame, the knowledge accrued during the research phase proved invaluable to overcome those obstacles.

Likewise, the skills and tools obtained during that same step, provided important insight into making the game more appealing and engaging through simple but fundamental aspects of the narrative. In this chapter we will touch upon some of the most relevant choices made pertaining the project's plot and how it was planned to unfold as the game was played. Conversely, the obstacles surpassed and the value attained through the application of these choices will also be touched upon.

As a result, this chapter will not focus on the finalized product of our Master's Degree Project. Rather, it will focus solely on the process that lead to that same finalized product, pointing out key phases in that same process that we deem relevant to this particular study. Namely, we will try to understand how each decision played a role in averting a loss of interest by the player, or contributed in promoting his/her sense of engagement.

3.1.1. The Unknown World: using a player's curiosity towards the plot as a means of engagement

In a videogame without an omniscient character or narrator, there's the need to establish a difference between what the player knows and what the main character knows, be it about the environment, the other characters' motives or the events about to unfold. While on a second playthrough (as well as subsequent ones), a player will already know everything that's happening or about to happen, the information he/she has during the first playthrough is based on what he/she experiences as the game is played. This presents the game designer with a valuable tool in leading (or misleading) the player through the plot, so as to serve the story's purpose or simply make it more interesting.

In this aspect, the videogame as a *medium* is very much like other *media*, such as cinema and literature; similarly to these, the first experience of a videogame (untainted by previous knowledge of the story) defines the way the player will rate the game, as well as its replay value (the chance of the player picking it up for subsequent playthroughs). As such, its connection to the phenomenon of player engagement is not only evident, but also of utmost importance.

As stated before, in Dead Harvest, it was established that Wicker wakes up to a diseased field, clearly wiped out by a plague, with no knowledge of where it came from or who (if anyone) was behind it. From that premise, we were presented with a choice: either provide the player with more information, or keep him/her at Wicker's level of understanding; which is to say, having no idea what happening.

Consequentially, a conundrum was created around exactly how much information (beyond Wicker's knowledge) the player should have, if any. On one hand we knew that too much information could spoil the story for the player by telling him/her (or allowing him/her to figure out) how it ended without playing the game. On the other, too little information might not be enough to drive the player to explore the game world.

In the end it was decided that keeping the player on Wicker's level of knowledge was the best course of action, giving both just about enough information to send them out into the world. This decision was based on the fact that, while too much information would definitely ruin the game's appeal, too little, while potentially dangerous, would always work as a premise, as long as it was properly provided as the story advanced. In other words, we would pique the player's curiosity through purposeful withholding of information at the start and later use it as a reward, giving it to the player as he/she advanced. As a result, that same curiosity would work as a means of engagement (leading the player to seek out answers) while contributing to the overall disquiet of the unknown that the game's story already carried.

Furthermore, we believed that keeping the player as appraised of the environment as the main character itself would greatly help in establishing a closer bond between the two. By dispensing the same amount of information about the situation, we'd be able to evoke the same curiosity on both the character and the player; this, in turn, would cause the player to

more easily and readily transpose his/her own emotions to Wicker. This phenomenon would indirectly contribute towards the fleshing out of Wicker as a believable and relatable character, which was one of the main objectives of the character development area of the videogame's concept.

Finally, by keeping the source of the game's antagonist (in this case represented by the plague) hidden we would be adding an extra layer of depth to the story: the need to solve the mystery surrounding the story's premise. In other words, by confronting Wicker (and the player behind him) with a post-apocalyptic scenario, whilst keeping them just about informed enough to be sufficiently lost, we believe to have created the disquiet and fear so commonly associated with such a setting. This, in turn, would contribute to the believability of the game world, helping the player more smoothly immerse himself/herself into it.

3.1.2. Linearity vs. Non-Linearity in the Dead Harvest narrative: planning out the narrative

A defining author in our research, Lee Sheldon extensively touches the matter of a videogame's linearity from a narrative perspective, as well as the advantages and disadvantages of giving a player multiple choices at any given point in the game. In other words, how much freedom a player should be given when playing a videogame and the implications of such a choice to the game's plot.

As we analyzed Sheldon's studies earlier in this dissertation, we understood that his view on the matter, while slightly paradoxal, could be an important guideline for the way we planned our own story. Sheldon believes that even though the progression in every videogame is ultimately linear, offering a player certain choices at key plot points will give him/her the illusion of freedom.

Applying these postulations to our project made the key issue in our plot progression very clear: we were faced with the choice to either offer the player few choices, which would result in fewer different plotlines, or to further develop different paths, which would result in more. Furthermore (should we choose the first option) we were faced with the issue of exactly defining how to present the player with these choices (through diverging paths, backtracking, dead ends, etc.).

As we discussed the different resources avaliable to us in the matter, we came to realize that some aspects of our game outside this area would already steer our choices towards certain options. Firstly, the fact that the game was built as a side-scrolling 2D experience severely limited the choices we could give the player. In oter words, while the assets themselves were made in 3D, the gameplay would be limited to two dimensions, which meant the player could only go forward, backwards, up or down (instead of moving in a tridimensional space).

The other limitating factor was the genre itself. Being a game with puzzle-like obstacles meant that there had to be a logical way to connect every challenge in a given level. If we built puzzles that spanned many levels or required too much backtracking, we would risk confusing the player or worse: making him/her get stuck at a certain point in the game (which would severely damage the engagement experience).

We decided to look for inspiration in solving these issues in classic side-scrolling videogames, such as Super Mario Bros. and Prince of Persia. These games, due to the technological limitations of their times, couldn't offer many choices to the player at the risk of completely losing the story. Consequentially, these games sought to use the levels as narrative units. In other words, each level would, by itself, be a completely independent experience: while there could be backtracking in a certain level, once a player was done with it, he/she was forced to move on, making the overal experience still as linear as it needed to be.

Applying this method to our own story, we would have puzzles that spanned an entire level, but never multiple ones. Sometimes the player would be forced to backtrack to a certain point in the level to obtain the solution to a puzzle at the end, but he/she would always have the knowledge that each puzzle had the key within that same level. This would give the player the

illusion of freedom within each level without making the obstacles too confusing to overcome.

However, while we were satisfied with the way the puzzles were contained to each level, we still believed the progression between the levels themselves was too linear. Going from the Farm Level to the City Level to the Laboratory Level (and so forth) seemed too rigid to offer any replayability value to the game; the player would simply play the game once and have little reason to pick it up again, as the story progression was exactly the same between playthroughs.

For that reason, we decided to design several more different locations and make it so that the player's progression through these depended on his/her choices. For example, depending on the choices the player made in the Farm Level, he/she would have the choice to go to the Woods or the City upon completing it. If the player chose he City, he/she would never see the Woods Level. Likewise, the choices presented at the end of the City Level would be different than the ones he/she would've had if the Woods were chosen.

These “forks” in the progression path would ensure that each playthrough experience was different: following the ongoing example, the player might choose the Woods instead of the City on the second playthrough, simply to see a different level. Even the story itself would also greatly benefit from our newfound method of level progression. Certain Non-Playable Characters would only appear on specific levels, which meant the experiences Wicker had during the course of his journey (and the characters he met) would be directly connected to the choices the player made. Ultimately, the game experience could still be defined as linear: however, by creatively reorganizing these elements, we would ensure the player felt in control of the progression, which we were certain would greatly contribute to his/her feeling of engagement.

3.1.3. Cutscenes in Dead Harvest as a Narrative tool

Another valuable contribution we found in Lee Sheldon's studies was his analysis of cutscenes in videogames, as well as their advantages and disadvantages to the narrative process and the player's experience of engagement. While we explored this particular aspect of Sheldon's work, we became aware of the inherent dangers to a videogame that the misuse of this tool can pose. According to the author, cutscenes can weaken a videogame in three fundamental ways: they require the player to stop playing the game in order to watch them, which breaks the experience of immersion; they tend to have better graphics than the game itself, which hurts the game's aesthetic experience (and ultimately the engagement as well, as we came to understand earlier); they tend to stifle creativity if used to solve every narrative problem.

All the aforementioned weaknesses nonwithstanding, we were resolute in using cutscenes in our project; we knew that, if used sparingly and intelligently, cutscenes were excellent conduits to transmit new information to the player as he/she progressed through the story, which we knew was vital to keeping him/her engaged. Nevertheless, it was paramount that we planned these cutscenes with their hazardous nature in mind, so as not to ultimately damage our project more than we intended to empower it. For that reason, we revisited each of the three main weaknesses, seeking ways to counter each, so as to capture all the advantages of incorporating cutscenes, without succumbing to the disadvantages such a decision might entail.

Firstly, we needed to place the cutscenes in key spots in the gameplay progression where we knew they wouldn't disengage the player from the videogame's immersive experience. In other words, we knew that if we placed them in the middle of a level, for example, they would distract or annoy the player, causing him/her to, for example, try to skip them without paying attention. As such, we identified points in the story where the player would already be forced to disengage as prime locations for the cutscenes: the end of each level. Simply put, since Dead Harvest was phased in levels for linearity purposes those small breaks in the narrative progression were regrettably unavoidable: by harnessing them as cutscene locations, we would effectively be fighting a flaw in the game while at the same time further advancing the story. Furthermore, this would present us with a privileged way to reward the player for completing a level by shedding a little more light on his/her curiosity (which, as we learned earlier, was also beneficial to the engagement experience).

Secondly, we needed to ensure that the cutscenes didn't visually deviate from the overall aesthetics of the videogame. In other words, if the visual aspect of the cutscenes was too different from the gameplay graphics, it would hurt the visual homogeneity of the game, resulting in an impoverished sensorial experience, once more hindering engagement and immersion[39]. The solution however, proved simple: we believed that any potential benefit that

39 The role of the videogame's aesthetical elements in engagement will be touched upon further ahead in chapter 3.3., “Fostering Player Interest and Engagement through other Resources”.

might be gained from the cutscene's improved graphics wasn't worth the loss of homogeneity; as such, we've decided that these would be developed using the game's own graphics engine, resulting in the exact same visual aspect as the game itself.

The two decisions we made as a result of the first two weaknesses would themselves contribute to supress the third; while it was true that the overuse of cutscenes could hamper our creative process, the fact that we had already decided to use them so sparingly (mainly only between levels) already forced us to find other ways to tell the story during the levels themselves. This would mean that, while the main plot points would be transmitted using these cutscenes (which would actually help in pointing out to the player their relevance in the story), any small advancements to the plot had to be transmitted using the resources avaliable in each level (such as speech bubbles, NPC behaviour, obstacles and so forth).

In retrospect, by aknowledging Lee Sheldon's acessment of a cutscene's weaknesses and working to minimize them, we believe to have incorporated most of the advantages achieved by this resource while avoiding its hazards; enriching our videogame's immersive potential in the process.

3.2. Wicker's Humanity: generating player empathy through the development of a character's personality

As we deepened our research into successful videogames from an engagement perspective, we noticed an undeniable, fundamental trait that spanned most of the examples we came across (in fact, present in all the artistic works directly referenced in Chapter 2 of this dissertation). We're referring to the presence of humanoid characters as an important part of these games; in other words, all the most relevant videogames (from this dissertation's point of view) championed the importance of antropomorphic characters (from actual human beings to other humanized species) in their narratives.

In other words, we believe this overarching premise present in the videogames mentioned above to be a solid argument towards the importance of a human (or human-like) character as a promoting factor behind the appeal of a game to any given player. To better illustrate this concept, we find it pertinent to divide videogames into three distinct categories, based on the presence of a main character and how humanlike this character is: Non-existent, Non-humanoid and Humanoid. Notice that the generalistic nature of these categories makes them only viable for the purposes of this particular example and that they can't present an overarching definition for every single videogame, as it's a relative subject (some games might exist beween two categories, for example):

Firstly, games with non-existent characters tend to rely on rules alone to engage the player. Fairly accessible examples of these games would be adaptations of real board games, such as Chess and Tic-tac-toe. These games present the player with an array of resources, set rules to manage said resources, and nothing else. The player then uses these elements to conduct one or more matches. Following the examples given above, Chess presents each player with a group of pieces (pawns, bishops, rooks and so forth) and rules for moving them (in a line, diagonally, one square at a time, etc.). These elements are set in stone and unchangeable, no matter how many games are played.

Naturally, since these games have no characters and, consequentially, no stories to unfold, the way they play out is based on repetition and strategy. While the logical challenge presented by this aspect can, by itself, promote player interest, the fact that it lacks characters and story deprives it from becoming a dynamic experience, advancing as the player plays more games. We believe this phenomenon to be a greatly weakening factor in the engagement potential of these games, since its consequential repetitiveness ultimately hinders a player's interest in them.

Conversely, games with non-humanoid characters can already carry a simple plot, not only presenting the player with resources and rules, but also with a specific goal he/she has to complete. While the previous games were played on a match-to-match basis, these games have a future element the player can look towards: an ultimate reward he/she can achieve after

successfully overcoming all the challenges the game presents. This notion alone makes these games more engaging than their “non-existing character” counterparts.

Finally, games with humanoid characters go a step beyond the aforementioned “non-humanoid character” games by introducing a third fundamental element of engagement: a character capable of human thoughts and emotions. While this might seem like an inconsequential aspect, the fact that the player can emotionally connect to his/her main resource in a game is of paramount importance to his/her interest in it. In other words, while in the other two categories the resources a player had avaliable were no more than soulless tools, in this category they transcend this state simply by having a name and a face. This phenomenon alone will lead the player to develop an empathetic relationship to the character, much deeper than any connection he/she might have with the resources in other categories. The player will now care about what happens to the character and strive to know how it will evolve during the course of the story; he/she will now have a solid reason to keep playing the game, simply because he/she cares about the character(s) in it. We believe this to possibly be the strongest element a videogame can have to promote engagement.

Comparing the three categories stated above, we can conclude that games with humanoid characters (and the consequential story associated with them) have more tools to keep a player interested than those without. This was the reason why we chose to develop Wicker as a human-like (albeit not a specifically human) character. While his species differs from our own (being, in fact, mythical in nature), he was given a human personality that shows through the way he copes with the story as it develops, starting with the loss of his harvest and the necessity to brave the unknown to restore it. Having a personality makes Wicker more than just a tool with which the player overcomes the game's challenges: it makes him into an object of interest to the player, as he/she will want to know how (or even if) he gets back his home and in what ways the process will change him. We believe that this would help solidify our project's appeal to the average player, making it more engaging to him/her.

A key resource in achieving a relatable character in Wicker was his body language. As most of the playtime would be spent moving the character through the game's envionment, the way he walked, ran and otherwise interacted with the world around him was the most relevant way of making him human-like. As such, we needed to find a way to make Wicker's animations as human as possible, so as to lead the player to subconsciously see him as a humanoid being, rather than just a videogame character.

To achieve this goal, the role of Motion Capture as an animation technique was of utmost importance. By animating Wicker through acting out his movements there was a much higher degree of control to be had, pertaining Wicker's body language. Certain involutary movements made by the human being while scared, for example, would most certainly be overlooked if animating in any other way (considering the level of experience a Master's Degree level animator has); by using Motion Capture, all these subtle but important movements were

successfully integrated into Wicker's animations. The result being a character that offered a much more convincing illusion of humanity.

3.3. Fostering Player Interest and Engagement through other Resources

By developing the videogame's narrative and main character, we had already outlined most of the key aspects of the story: namely, the world we wanted to create, how we wanted to populate it and how we wanted the plot to unfold. However, even after the story itself was oriented, player engagement could still be reinforced through other means.

In other words, we were aware that a story is only as good as the attention span of the listener: we needed to make sure the player was motivated to follow the story we put before him and see it through (rather than lose interest halfway). While we believed the plot and characters we developed already contributed towards this objective, we knew we had further work to do on key aspects of it (as well as other areas of the game, such as gameplay) so as to ensure the player would feel compelled to play the game to the very end.

The result, we hoped, was that our project would simultaneously appeal to a player in many different ways, solidly covering what he/she might expect from a videogame experience. It was our belief that, the closest our project got to that goal, the more positive results it would yield.

However, as simple as such a goal might seem, its undertaking was beyond challenging. In our opinion, the main reason for such difficulty would be that, ideally, every single aspect of a videogame has to purposefully be directed towards fostering engagement; if we take into account the multiplicty of factors present in a videogame, both creative and technological, it comes as no surprise that this would turn out to be one of the most demanding phases of our project. In this chapter we will expose some of the most relevant aspects we worked on outside of the two main areas of our study (Narrative and Character Development), while putting particular relevance on their connection to our overarching objective to foster the future player's sense of engagement.

3.3.1. Dead Harvest as a Puzzle/Adventure Game: ramifications of genre regarding engagement

As previously stated, we believed that having a personality-driven humanoid character would grant our project a deeper layer of connection to the player than if it was merely a rule-oriented match-based game (such as Chess). However, while this aspect was of paramount importance, we couldn't disregard the core rules of the game, as these also play an important role in keeping the player interested: in other words, even with depth of story and character humanity, a game's core rules and resources can make it uninteresting to the player if developed incorrectly.

As such, the choice of genre for the game was a point of much debate, as it would define not only its very essence (ergo, the way it was played), but also its general appeal to the average player. We knew, however, that basing the genre purely around narrative would definitely weaken its potential for engagement. We believed this to be true mainly because, without a set of rules and a need for the player to interact with the environment, the game would be nothing more than an interactively enhanced film. While this *medium* has its own appeal, following it would just defeat the purpose of the project itself: creatively planning and developing an actual videogame.

Following this line of thought, we came to the conclusion that we needed a game that actively presented a mental challenge to the player. Forcing the player to make decisions and solve problems was the best way to engage his/her interest, since it made him/her a central part of the story's advancement. For that reason, the genre solution we arrived upon was the Puzzle Game.

Puzzle Games, are defined by the unique challenges they pose to the player, due to their logical nature. In other words, these games engage the player's cognitive knowledge, such as reasoning and memory (as opposed to his/her reflexes and dexterity). While there's certainly potential for player investment in fast-paced, skill-based games (such as First-Person Shooters), we believe this investment to be contained to the immediate experience and not as sustainable in the long term as the logical challenge. In other words, while an immediate reflex-testing experience will certainly keep the player engaged, the puzzle as an ingame obstacle will keep him/her engaged for longer, as it requires careful consideration and trial and error.

Nevertheless, we wanted to at least incorporate some of the real-time experience present in the aforementioned fast-paced games; the reason for such a decision being that the puzzle experience, while more appealing in the long term, might cause the player to lose interest in the short term. We feared that, should the game have no pace at all, the player might lose interest as soon as he/she failed to complete a puzzle. As such, we chose to hybridize the genre towards Action/Puzzle, giving it key features such as controlling Wicker in real time to provide the player with a more hands-on tackling of the obstacles.

An example of a similar symbiosis would be the “Legend of Zelda” videogame series, of which the title “Majora's Mask” was a key part of our artistic research (present in Chapter 2 of

this dissertation). Similarly to our own genre adaptation, “Majora's Mask” incorporates aspects of both the Action and the Puzzle genres: on one hand, the real-time combat present in most Action Games, where the player has to actively dodge enemy attacks and projectiles; on the other, the cognitive challege of Puzzle Games, where the player has to memorize and logically process information to overcome obstacles.

Finally, by combining the two genres, we could more easily weave the puzzles into the action of the game itself. For instance, the wheelbarrow puzzle present in one of the scene in the trailer[40] is a practical aplication of a basic reasoning exercise (identifying the broken wheelbarrow, gathering the required components and combining them into a new wheel). While the difficulty of these puzzles would range from simple (as was the case with this example) to complex, their integration in the game environment would always be done in a similar manner to this one. In a sense, with action as a mediator, we could bring the puzzle challenges and the story aspect of the game closer together, making the experience more homogeneized and, as a result, more solid and engaging.

40 Please refer to the Dead Harvest trailer, 00:00:59 to 00:01:09

3.3.2. Visual Experience in Dead Harvest: achieving engagement through the videogame's aesthetical elements

As important as the core content of a game might be (from its story and characters to its playability and rules), it stands on the deepest level of the videogame experience: through playing the game, the player unearths this content which in turn keeps him/her engaged to find more. However, a videogame's first line of contact with the player can often be as important as its core content, since it'll be the first to draw him/her in (or, if done incorrectly, drive him/her away).

At the nexus of this first line of contact stands the videogame's aesthetical element. The experience this element entails is the very first connection the player establishes with the game; at the start of the playing experience, the first thing a player will notice is how the game looks and sounds like, rather than the story it tells or the rules it entails. By appealing to a player's taste, a game will immediately forge a bond of engagement; it's through this first contact that the player finds the experience positive or negative from his/her own aesthetical sense (in other words, finds it beautiful/sublime or not). Only if the response is positive will the player feel compelled to delve into the game's underlying aspects (such as the story, mentioned above) and deepen his/her own experience of engagement.

As such, we found it of the utmost importance that the choices made in this area were both appealing to the average player and consistent with the tone established by the story. In other words, while we wanted a game that was visually and auditorily interesting, we didn't want any of the choices made in the pursuit of that objective to clash with the game's somber and disquieting story; we knew that, while a good aesthetical experience would empower the game's engaging potential, it could be offset by its lack of homogeneity, should we fail to correctly develop it. Simply put, we wanted the game's aesthetics to feel appropriate to the story.

While we're aware that a videogame's aesthetical experience isn't purely visual (as is the case with any of the other similar art forms), we will only be touching upon its visual aspect. The auditory element of the game was, of course, a point of debate in this phase of the project; however, being dramatically outside of our area of expertise, this part was largely out of our control, as we had to trust our colleagues' experience in it.

Visually, on the other hand, both the choices that had to be made and their technical ramifications were our entire responsibility. We knew early that we wanted a style that was both colourful and unusual, while not out of the reach of our current experience in 3D development. The choice we arrived at was a technique known as “Cell-Shading”, where light and shadow is simplified, giving the composition a very two-dimensional feel.

Fig. 10. Early "Cell-Shading" test – Barn Level

However, we noticed early that this choice, while aesthetically solid (from an average player's perspective), had two major issues: firstly, it felt undefined and blurry, making it hard to understand shapes; secondly (and, in our view, more importantly) it was too bright and colourful to fit with the somber theme set by the story. While we felt very close to the result we were aiming for, there was still the need to make a series of tweaks before we were completely pleased with the result.

Fig. 11. Final Compositing test – Farm Level

To solve the blurriness of the shapes, we resorted to "Toon Outline", a functionality in Maya that calculated the position of every mesh, creating a black outline around them. This alone made every shape much more defined and interesting, effectively solving the problem. The problem with color, on the other hand, was solved in post-production; after rendering every frame we then dessaturated the colors and added several darkening and particle effects to make the image look more bleak and somber. While this was a process of trial and error, we were satisfied with the final result, managing to keep most of the "Cell-Shading" appeal while at the same time setting it to a darker tone to fit the story. The result was a visual aspect that we were certain would appeal to the average player, therefore engaging him/her and paving the way for the story and gameplay to keep him/her interested.

Final Note: Project, Dissertation and the Contibutions of both to the Author's Personal Development

As a starting point for this dissertation we sought to understand how an independent videogame, through intelligent use of a well-built story and characters, could engage a player without the massive economical resource investment a mainstream videogame entails. This understanding led us to not only delve into these videogames' strongest assets, their narrative and character development, but also to touch upon what it was to actually “draw a player”.

As such, our research was first focused on that particular phenomenon pertaining to a player's experience of connection with a videogame; briefly analyzing the works of acclaimed psychologists, such as Jerome Bruner so as to better understand the concept of engagement. Secondly, we analyzed studies on character behaviour, as we were aware of how important the main character was to establish a connection to the player. By empathizing with the character, the player would feel engaged to either play or keep playing the game, which was, ultimately, the main objective. Finally, our research sought out studies in narrative, as knowledge on how to plan and manage a plot was key to the game's quality. Through these studies we understood how to properly structure and deliver our story to the player, in a way that would keep him/her interested in it.

Upon completing our research, we then applied the tools and techniques gained from it to our own decision-making process regarding our project. In other words, the most relevant authors' postulations were tested against the obstacles and challenges faced during the project, most of which pertaining to aesthetical and conceptual choices (although some even pertaining to practical choices, such as the usage of Motion Capture as an animation technique). As a result, we were able to more easily locate and avoid potential weaknesses in our project's overall appeal; specifically in its plot and main character, Wicker. Furthermore, some of these choices also helped in polishing certain aspects of the game (such as the narrative's structure) which, while not avoiding any particular hazards, also contributed to a more solid and interesting result.

We feel like understanding engagement, first and foremost, was a small but important step for the whole process (both within and without the dissertation), as it established a solid basis against which the results of the project could be measured and registered.

As such, not only did we achieve a better understanding of how to create compelling narratives and flesh out lifelike characters, we also learned how to properly appraise the value of these newfound skills, all the more appreciating their added value to our personal development as professionals within the area of Computer Animation.

In the future we hope to apply the aforementioned knowledge gained towards our first foray into the professional environment. Specifically, we believe our work at *Bigmoon Interactive Studios*, a commercial videogame development company, to have greatly benefitted from our experiences in this dissertation and the project it's associated with. By better understanding how to promote a player's interest, we've strengthened the potential for quality and profit in our work; in a fast-expanding market as the videogame industry is, such a distinguishing factor is vital for success.

Bibliography

- Bidarra, R., Goossens K., Schaap, R. (2010, August). Growing on the inside: Soulful characters for video games. *Proceedings of IEEE Conference on Computational Intelligence and Games (CIG),* 18-21 August 2010, Copenhagen, Denmark*,* 337-344.
- Boyle, E. A., Boyle, J. M., Connolly, T. M., Hainey, T. (2011). Engagement in digital entertainment games: A systematic review. *Computers in Human Behaviour,* 28(13), 771-780.
- Browne, C. (2010). Evolutionary game design. *IEEE Transactions on Computational Intelligence and AI in Games*, 2(1), 1-16.
- Campbell, J. (2004). *The hero with a thousand faces*. Princeton: Princeton University Press.
- Cavazza, M. (2002). Character-based interactive narrative. *IEEE Intelligent Systems*, 17(4), 17-24.
- Crixell, W. (2009). Games have stories to tell: narrative can extend beyond the covers of a book (the gaming life). *School Library Journal*, 55(6), 28.
- Downs, E. & Smith, S. L. (2010, September 2). Keeping abreast of hypersexuality: A video game character content analysis. *Sex Roles*, 62(11), 721-733.
- Dujardin, T. & Routier, J. (2010, August/September). Behaviour design of game character's agent. *Web Intelligence and Intelligent Agent Technology, IEEE/WIC/ACM International Conference on Dujardin, T.*, 2, 423-430.
- Gaudiosi, J. (2010). Character traits: The current generation of CG game characters continue to push the state of the art (gaming)*, Computer Graphics World,* 33(8), 9.
- Ingebretsen, M. (2010, September/October). Making videogame characters smarter. *IEEE Intelligent Systems*, 25(5), 6-7.
- Jansz, J. & Martis, R. G. (2007, February 2). The Lara phenomenon: Powerful female characters in video games. *Sex Roles,* 56(3), 141-148.
- Jung, C. (1964). *The man and his symbols*. London, Aldus Books Limited.
- Kistler, F. (2012). Natural interaction with culturally adaptive virtual characters. *Journal on Multimodal User Interfaces,* 6(1), 39-47.
- Lopes, L. B. (2009). Personagens e estereótipos: Estudo sobre representação visual de personagens com base em estereótipos. *Proceedings of VIII Brazillian Symposium on Games and Digital Entertainment*.
- Martins, N., Harrison, K., Ratan, R. A., Williams, D. C. (2011). Virtual muscularity: A content analysis of male video game characters. *SciVerse ScienceDirect Journals, Body Image,* 8(1), 43-51.

- Michael, D. (2003). *The Indie Game Developer Survival Guide*. n.l., Charles River Media.
- Propp, V. (1968). *The morphlogy of the folktale*. Indiana, The American Folklore Society and Indiana University.
- Robertson, J. (2011). Game design through mentoring and collaboration. *Communications of the ACM*, 54(12), 9.
- Sheldon, L. (2004). C*haracter development and narrative for games*. Boston, Thomson Course Technology PTR.
- Vogler, C. (1998). *The writer's journey*. Virginia, Michael Wiese Productions.

Appendices

< Appendix 1: Dead Harvest Trailer (DVD) – Duration: 00:02:16 >