



# **Agile development in the video game industry**

## **Examining the effects of iteration and methods of limiting it**

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## Abstract

This research is examining one of the most dominant managerial methods used in development in the video game industry, Agile development. More particularly, the thesis examines a certain attribute of Agile development, that of iteration. The thesis will set to examine how iteration affects several layers of development during the production of a video game and whether it can be replaced by other managerial technics.

As a result, the purpose of this thesis is to raise a different viewpoint against the Agile's iteration. Furthermore, this thesis aims to contribute to the academic research by concentrating on the video game industry, an industry that is often neglected by the academia.

The theoretical framework and literature review concentrate on concepts of Agile development, overworking, development cycle in video games, definitions of project success and project failures and creative process in video game development.

The thesis deploys qualitative methodology to address and research its data. The collected data belongs to two categories, data stemming from interviews conducted by the thesis's author and data stemming from journalistic magazines.

The results of both type of data are compared and act supplementary to each other, then they are analyzed to answer the research questions asked by this thesis. The results showcase that iteration has negative effects to video game developers in both a macroscale (company's resources, annual revenue) and in a microscale (overworking, health issues) level. The results also highlight that Agile is an all-time favorite development methodology of developers in the video game industry.

In conclusion, the thesis supports the notion that iteration should be suppressed and proposes a number of solutions for that matter. The suggestions are essentially encouragement towards developers: to seek higher interactivity with customers throughout the duration of all the development stages of a video game, to show more trust to established gameplay mechanics and to place more reliance on a franchise's profit power and benefits. These measures can be used in a preventive manner in order to limit the appearance of iteration and as a result, to limit its' negative effects.

**Keywords:** *Agile, iteration, video game development, overworking, crunch, creativity, resources*

## Abbreviations

AAA: High quality video game, made with high production values

APM: Association of Project Managers

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## 1. Introduction

Video gaming industry is a rather young industry, that started small and developed the last 3 decades into one of the most lucrative industries in the world. Indeed, the video gaming, mainstream, commercial history starts essentially on 1972 by Ralph H. Baer aka the ‘‘father of video games’’ (Brown, 2014). It falls into the domains of entertainment and art and its developments and new products are well known headlines to everyone, even to those who are not gamers.

A video game aims towards interactivity and immersion. There are four domains that contribute to achieve that goal: aesthetics (graphics, music gameplay, narration/story), entertainment value, art value and game mechanics depth. To achieve success in these domains, video game developers have to manage large teams of staff and funds. Indeed, often the production of a video game needs at least 1 million euro to be completed within a usual 2-3 years production cycle (Zackariasson et al., 2006, p.76).

Developing is not a straightforward process. Due to its inherent artistic nature and the need of customers for something that will excite them, video games are subjected to continuous revaluation and critical decisions are made to satisfy customers. These decisions often require the regression of the development into its earlier phases. As for the content that has been created until this point, it is not unlikely that will be scrapped in favor of other more acceptable ones. Also, there are occasions in which the developers may find other creative ideas, that they deem better than the initial ones, or find more efficient implementation methods of innovation than the ones they used so far. The favorite managerial tool of developers, that allows flexibility during development, is Agile methodology which encourages the use of heavy iteration during every stage of development. Agile is a common methodology used in the software industry, it advocates a multi-layered collaboration among self-organized teams (consisted of members with different roles and duties) and their intended customers (Agilealliance, 2018). In essence, it is a methodology which embraces and encourages flexibility, continuous planning and re-planning, in order to achieve a continual achievement process and deliver a product of high quality (Agilealliance, 2018).

However, Agile’s iteration comes with some major consequences during the production. A major consequence of restarting development includes the danger of missing important milestones in development. The result of that is that companies go overbudget and face financial difficulties. To compensate that, the companies will either cut out content to finish their product in time or scrutinize the relations with the publisher or use more resources than initially estimated or resort to crunch (Schreier, 2016). To elaborate more into the last consequence, companies resort to keeping their employees working more hours than normally. The crunch phenomenon has become so frequent in the industry that it has been normalized as something natural in the collective conscience of every stakeholder in the video game industry and its difficult to oppose it (Schreier, 2018).

This thesis explores the notion of whether the end result product, made by constant retesting, can be achieved in the earlier phases of development. In other words, it explores the

possibility of replacing iteration with other more successful and faster technics. It also examines how Agile's iteration affects the production of a game in its various layers (company's resources, artistic integrity and the quality of life of employees in the video game industry).

Essentially, these abovementioned points constitute the research questions that will be discussed more thoroughly in the "Research questions" section. Additionally, the purpose of this thesis is to advocate and justify a critical view on Agile methodology in the video game industry and more particular about one of its features, iteration. Indeed, currently it is widely accepted by this industry that Agile and its iteration are both undisputed parts of the industry and also necessary elements to achieve success. However, as this thesis showcases in a detailed manner, this methodology is responsible for many cases of project failures, consumption of company's resources and deteriorating the staff's quality of life. Furthermore, it is in this research's purpose to encourage the academic community to conduct more researches about the video game industry. Unfortunately, the academia is treating this industry as part of IT industry in general and as a result there do not exist many researches that specialize in it. By presenting a unified body of literature sources that is associated specifically in that industry, this thesis hopes to encourage further academic research in that field.

Useful concepts, terms and definitions for creativity, innovation, project success and failure and overworking will be described in the "Literature review" section that will familiarize the readers with recalling terms discussed frequently in this thesis, whereas supplementary information and data about crunch, video game development and Agile development will be shared in the "Theoretical framework" section that will offer support to the analysis of the research results.

Afterwards, the specifics of the qualitative methodology along with the principles of intermediate theory will be discussed in the "Methodology" section, so that it becomes transparent and clear how this research has been conducted. What follows is the presentation of the research results in the "Research results" section in which the data collected by interviews and journalistic magazines are presented and create a case against Agile's iteration.

These results are then analyzed in the "Analysis" section in a way that address successfully the asked research questions in the beginning of this thesis. With the analysis completed, the next section will be the "Discussions" section and will be dedicated to discussing the findings of this research and in what degree the research questions have been answered.

The "Conclusion" section will summarize everything written and presented in this thesis, in the hopes to highlight the purpose of this thesis and make clear statements and describe with simple words the findings of the asked research questions. Also, this section will describe how future researches can expand further to these findings in new topics. The questions asked to the interviewees can be found in the Appendices list. Lastly, the "Conclusion" section will explain in what capacity the research's purpose has been fulfilled.



## 2. Research questions

Video gaming industry is a highly profitable one, with a market that reaches throughout the world and keeps advancing and expanding. With the development of an average game lasting usually 3 years, the involvement of teams of many employees with different roles and the demands of collaboration and artistic expression, it becomes clear that tight management is an integral part for the successful development of a video game (Zackariasson et al., 2006, p.76). Indeed, the method of Agile development and, as a result its feature of iteration, is widely used by a large percentage of video games during their development (Zackariasson et al., 2006, p.76).

The alleged advantages and benefits of Agile development include “adaptive planning, evolutionary development, early delivery, and continual improvement, and it encourages rapid and flexible response to change” (Agilealliance, 2018).

But is indeed Agile development the most appropriate managerial tool for video gaming development?

This thesis will examine a certain feature of Agile development which is iteration (the practice of repetition during development cycles until the desirable results are reached). What follows, are arguments about the efficiency of Agile methodologies and more particularly about the iteration it promotes.

### 2.1. Iteration, as a practice, can potentially contradict moral values (crunching)

The most bekknown effect of iteration and, also one of the most striking working conditions in video gaming industry is the crunch phenomenon. Essentially, crunch is a term used in the industry to describe the overworking of staff when a deadline is approaching (Peticca-Harris, et al, 2015, p.573). Many employees feel it is their responsibility to work more hours as a means of advancing their career and a way to overcome competition and achieve promotions, it is a process that has been described as a “rat race” (Hamermesh & Schor, 1993, pp.419-420). It is viewed from the employees also as a responsibility towards their clients and the company (Hodgson & Cicmil, 2007, pp.431-433).

This phenomenon is credible and very common, there are several cases with companies enforcing and expecting their staff to perform longer hours, repeat tasks and restart entire development cycles due to the demands of iteration (Peticca-Harris et al., 2015. p.571). Although this phenomenon is considered to be expected and a standard practice in the video gaming industry, it is often scrutinized by employees and has been described even as the “dark side” of the industry (Peticca-Harris et al., 2015. p.571).

The negative consequences of that practice (and, as a result, of iteration as well) can be summarized as an underlying fear for the workers that if they don’t work more than is expected, then they might lose their job (Sturges, 2013, pp.349-352). Also, the option of working less hours seems unnatural to them (Sturges, 2013, pp.349-352). To showcase the extreme conditions of crunch, it should be noted that a normal working day involves usually 35-50 working hours per week (Legault & Weststar, 2015, p.11). In contrast, during a

crunching period these hours increase to 45-70 (Legault & Weststar, 2015, p.22). This overwork has been reported to cause both physical (like musculoskeletal pains in the back) and mental anguish (the feeling of burnout) (D. Hodgson & Briand, 2013, p.309 ; Green & McIntosh, 2001, pp.291-292). It is a common practice that these extra hours are unpaid and they cause strains to the personal and family life of the employees (Deuze et al., 2007, pp.348-349). Also, this practice promotes non-compete and non-disclosure agreements that can cause the loss of professional opportunities and oppose the establishment of unions (Deuze et al., 2007, p.349 ; Dyer-Witthof & De Peuter, 2006, pp.607-610).

Agile development led indirectly to the neo-normalization to the employees of working long hours in the company and making personal sacrifices. This practice affects negatively the quality life of many employees and puts a psychological strain to them. The most paradoxical about this phenomenon, is that employees choose to be put under these conditions themselves, an effect of neo-normalized control (Fleming & Sturdy, 2009, pp.571-572).

## 2.2. Iteration is costly because it requires a lot of resources, is time consuming and interferes with artistic integrity

The stages of video game development include preproduction, production and publication of the game. Preproduction in Agile development is rather short, instead the emphasis of Agile is rather seen during the production phases (Politowski et al., 2016, p.25).

It should be noted that video gaming development is not a homogenous procedure for every project of every developer company, so Agile development doesn't perform with the same efficiency with every video game project (Murphy-Hill, 2014, pp.2-8).

The Agile methods and iterations might not be necessary flawed, according to Politowski et al. (2016, p.25), but are a subject of misunderstanding in many cases. Indeed, developers can expect certain outcomes and benefits by these methods when that is not necessary the case. That happens because Agile methods can prove difficult to apply depending the situation (Politowski et al, 2016, pp.25-27).

Agile methods cannot provide good information and insight when organizing and planning the timeline of a project (Politowski et al, 2016, p.27). For instance, it is a common phenomenon that the planned milestones during video game development will not be likely reached. A consequence could be crunch time, which was discussed above, or extending the milestones and requiring as a result more resources than initially expected (Politowski et al, 2016, p.27).

Another negative aspect of Agile development is that it contrasts with the needs and demands of video gaming development in general (Hodgson & Briand, 2013, p.309). More specifically, top hierarchy tends to intervene and micromanage the developing process, a tactic that doesn't correspond well with the Agile process. Furthermore, the artists and animators have expressed numerous time displeasure for the antics of Agile methodologies and due to the restrains it puts towards personal expression (Hodgson & Briand, 2013, p.309). To expand further to that argument, video game managers, who rely to Agile process, tend to underestimate the individualism of artists and take for granted the collaborative

assumptions of iteration, thus managers make the artists to feel frustrated and less productive (D. Hodgson & Briand, 2013, p.309-310). These setbacks can have potentially negative influence to the overall resources of a company.

### 2.3. Iteration is unnecessary based on Hume, from a philosophical point of view

Another approach would be by examining Agile management from a philosophical perspective, with the intention of arguing in favor of this thesis research questions and to question the validity and efficiency of Agile methodologies and the iteration these methods promote.

David Hume, the famous philosopher, is one of the major representatives of positivism. His views can be evaluated as the backbone of management thinking and methodologies, since management is often reviewed and approached via positivist methodologies (Biedenbach & Müller, 2011, p.82).

From a philosophical point of view, according to the philosopher David Hume, knowledge stems from experience (Gracyk, 1997). And as an extension, imagination is based on knowledge (Gracyk, 1997).

By making the assumption that the history of video gaming development has been long enough (the history of video games started on the 50s and became mainstream successful on the 70s), the argument can be made that all the knowledge in that field has been already acquired at present. Then this history could be sufficient of providing the necessary principles and empirical data to form strategic plans, anticipate outcomes, know what gameplay mechanics and level designs work better, the proper function of aesthetics, to manifest artistic and entertainment values and know the tastes and preferences of the target audience. In other words, the video gaming development history is long and has practiced all of its methodologies and also reached all of their outcomes.

According to Hume, imagination and inspiration are not unlimited and baseless. It is based on the teachings and doctrines associated to acquired knowledge (Gracyk, 1997). In combination with the abovementioned assumption of finite knowledge in video gaming development and having reached the full potential of it, then patterns of aesthetics and gameplay mechanics can be established and employed by developers, instead of blind experimentation. Experimentation, by its own nature, needs iteration to be confirmed and thus by eliminating experimentation, the process of iteration during development is limited too (Vezzoli et al., 2015, pp.7-8).

Hume advocated specifically that his theories of knowledge and imagination apply to art (Gracyk, 1997). Video games are considered a form of art, thus the doctrines of Hume can apply in their case as well.

### 2.4. Research questions

Following the above arguments, the present thesis will examine two research questions:

- 1) How to limit the amount of iteration during video gaming development?
- 2) How Agile development's iteration influences/affects the development of a game?

The second research question will be answered by examining first 3 different layers of game development, the human factor (which examines the quality of employee's life and work due to Agile's iteration), the company's resources (which examines how the resources of a company are affected by Agile's iteration) and the project's artistic integrity (which examines whether or how Agile's iteration interacts with the artistic integrity and vision of the project).

As far as the author's knowledge goes, these research questions have not been examined before in previous academic papers so far. Video gaming industry has not been examined in depth by previous papers. The researches, so far, do not take into account the artistic element that comes with game development, as well as the dynamic relationship between customers and developers along with the organic role of customers during the production of a game. Instead, what researchers are concentrating on, is a technocratic, corporate approach. This thesis intends to take a unique approach and seek whether Agile methodology with the iteration it advocates, is the most suitable managerial tool. The Video gaming industry generates annually a large revenue, reaches a big market and offers thousands of job positions. Its mechanics and optimization options should be further examined as a result, so that the industry can reach its fullest potential.

### 3. Literature review

#### 3.1. Literature review summary

The literature review will provide content and insight for concepts and terms that will be used extensively in the analysis and discussion sections of this thesis. These concepts are summarized as Creativity, Innovation, Work intensification, Project failure and success and lastly, work intensification. These terms constitute the literature backbone of the thesis. In particular, this section provides definitions and insight to the layers of the video game development that are affected by iteration (the topic of this thesis). All of the abovementioned concepts were used, also, when asking the interviewees questions that were relevant to the research questions.

Since there are not enough direct literature sources revolving around the video game industry, this thesis attempts and succeeds to generate new literature evidence that is focused to it. The thesis achieves that by combining general concepts and general definitions created by a variety of researchers and highlights their specific relevance to that industry. In that sense, future researches in the video game industry can count on this thesis as a reference point.

#### 3.2. Creativity

Creativity management describes the process of producing, evaluating and finally introducing ideas that can later be implemented in an organization via the innovation process (Berman & Kim, 2010, p.621). Creativity is often associated with problem solving or ‘puzzle’ solving (Berman and Kim, 2010, p.622). Creativity management intends to expand the staff’s participation and contribution in the creativity process, however it should be noted that creativity is not an obligatory skill for staff to display. Instead, creativity is considered voluntarily (Berman & Kim, 2010, p.622-623).

According to Product Development and Management Association (PDMA, 2004, p.581), creativity is ‘the ability to produce work that is both novel and appropriate’.

From a historical standpoint, creativity was firstly analyzed in a theoretical model in 1924 by Wallis in his book ‘The art of thought’ (Green & Kaufman, 2015, p.4). According to that theory, creativity can be established by five stages in total. These are:

- Preparation, in which an individual’s mind becomes focused solely to the issue on hand and tries to inquire all the available information and then examine the issue on hand by every possible angle.
- Incubation, it describes the internal process of evaluating and judging the issue on hand. Essentially, this process is preparatory for the externalization of any creativity thoughts and appears in a subconscious layer.
- Intimation, this stage follows the inspiration and creates the feeling in the individual mind that the solution of the issue on hand is nearby and will become available and understandable in the very near future. In all regards, it describes an intuitive, internal process that awaits conscious awareness.

- Illumination, this process follows immediately after the completion of the intimidation stage. In that state, the individual's mind becomes aware of his ideas and creative impulses. Not only that, but the individual's mind is capable of initiating critical analysis and provide insights in the creative ideas that have come forward.
- Verification, this is the final stage of creativity. The individual has become fully aware of his creativity and now begins to verify it, analyzes it and explores to find staples in it. This is a preparation that is needed before the materialization and application of the creativity findings.

A definition of creativity, a definition highly relevant to this thesis, summarizes creativity as a series of sequences that seek to produce originality and value (Mumford, 2003, p.110). The most prominent characteristics of creativity are: managing to be expressive and manifesting a high degree of imagination. That definition also serves another purpose, as it highlights why creativity is so susceptible to the iteration process (Mumford, 2003, p.110). Indeed, the creative idea's potential is constantly tested and evaluated during iteration, as well whether these ideas can be implanted like they were originally imagined (Mumford, 2003, p.110).

Another angle of inspecting creativity, which is widely used to explain it, is the four 'P's (as can be seen in Figure 1). In summary, these Ps are Person, Process, Products and Press (Mandico & Higgins, 1997. pp.298, 300).

According to PDMA (as sourced by Zackariasson et al., 2006, p.77), "An arbitrary harmony, an expected astonishment, a habitual revelation, a familiar surprise, a generous selfishness, an unexpected certainty, a formable stubbornness, a vital triviality, a disciplined freedom, an intoxicating steadiness, a repeated initiation, a difficult delight, a predictable gamble, an ephemeral solidity, a unifying difference, a demanding satisfier, a miraculous expectation, and accustomed amazement." In a few words otherwise, PDMA offers the same definition with Mumford, that creativity strives to generate innovative work that at the same time is both original and differentiating.

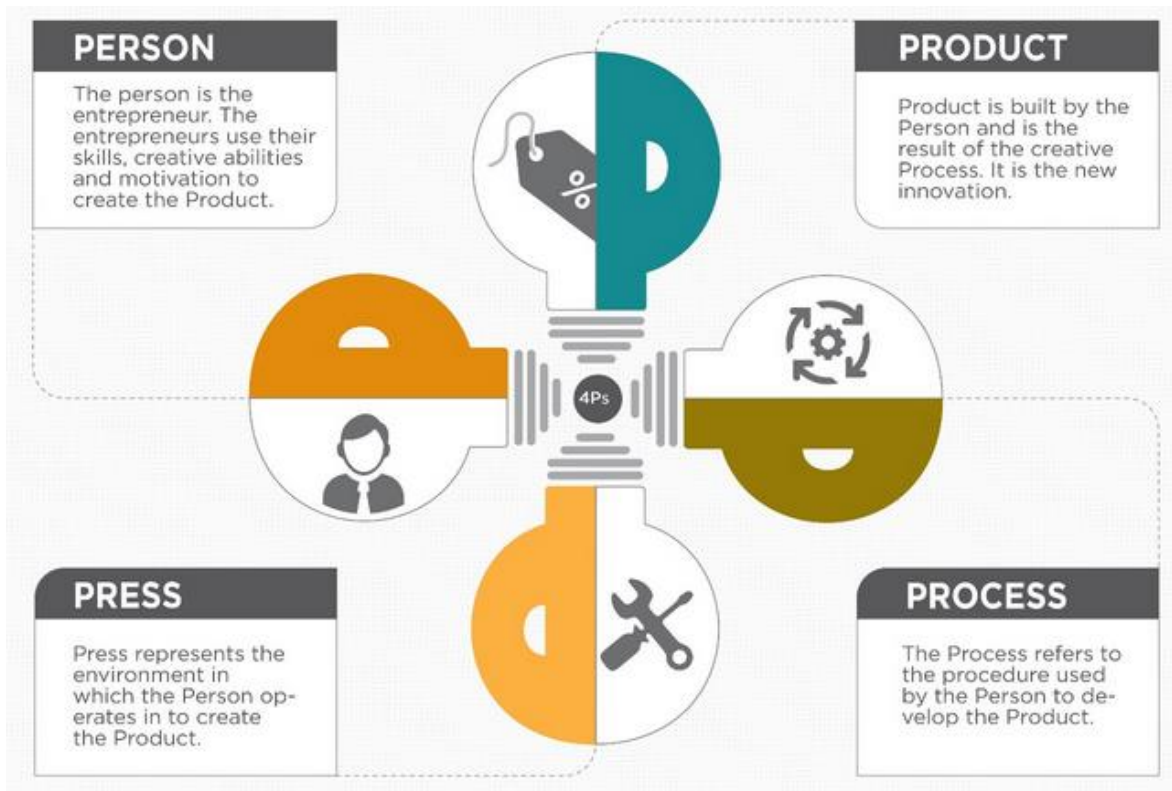


Figure 1, 4Ps of Creativity: What are They? – SparcIt Blog – Medium,” 2016.

In video game industry, there is a challenge to integrate successfully the artistic and technical creativity and to operate successfully the complex relationship of managerial, artistic and technological aspects of the business (Hodgson & Briand, 2013, p.311).

In relation to Agile methodology (and as an extension to its practice of iteration), according to Hodgson & Brand (2013, p.322), the staff related to artistic and creativity tasks is reportedly resistant to the practices of Agile. The artistic team view Agile methodology as a limitation to them, as an administrative tool unrelated to creative sensibilities. It doesn't take into account the unique aspects of the artistic labor, such as that inspiration is not available every day (Hodgson & Briand, 2013, p.320).

It is important to note that creativity should not be confused with innovation, a term that refers to the integration process of creativity or to the materialization of creativity in other words, as will be analyzed below.

### 3.3. Innovation

According to (PDMA, 2004, p.591), innovation is “a new idea, method, or device. The act of creating a new product or process. The act includes invention as well as the work required to bring an idea or concept into final form.”

Innovation is the most important aspect in the corporate world (Burns, 2013, p.383). It is a crucial tool in order to obtain the competitive advantage over the rest of the competitors and furthermore to initiate changes and exploit opportunities (Burns, 2013, p.383).

Innovation comes as a natural continuation of creativity, in the sense that it materializes the creative ideas into reality. It describes the process of introducing elements that are new and have never been seen before (Burns, 2013, p.384). In general, innovation is connected with iteration (the examined subject of this thesis), a fact that is better understood when considering the categories of innovation (Burns, 2013, p.384). These are:

- Product innovation, in which the functional qualities of the product or its design or other of its mechanisms are re-evaluated and improved. That feature illustrates the connection with iteration, as via iteration, product innovation is enhanced and holds a more natural position in the development process. In the field of video gaming development, it is a usual practice to test the video games repeatedly. Many developers have even specialized sectors which are Quality testing.
- Process innovation, in which the production line of a product is continuously tested and might be revised in order to achieve optimization. This category could involve potentially video game developers, because many developers try to publish their products on their own instead of relying to a third party to act as their publisher. In that regards, many developers seek methods of low cost production that simultaneously will provide to their customers easy access to purchase their products. But this process is not static. Some publication methods that work for one developer might not work for another. For example, due to how one company's customer base is accustomed to purchase this company's products, it doesn't mean that customers are appreciative of another company to use the same method.
- Marketing innovation, in which, as the title suggests, innovation is revolved around the marketing of a finished product. In case that a video game developer is involved actively in the publication of its products, then this type of innovation is of interest to it. Marketing in video gaming can begin even during the development stage of a game, in order to engage the customers, familiarize them with the game and rise the anticipation. Because of that, marketing is following closely the results of any iteration during the development cycles, so that the customers receive the latest and most precise updates about the product.

According to Bolton and Thompson (2000) (as cited by (Burns, 2013, p.386), there can be 3 ways to approach innovation and all these ways can be potentially intertwined with each other. These are:

- Establish the problem and try to solve it.
- Establish a solution and then try to find the problem it belongs to.
- Locate a need (instead of a problem) and then find its solution.

To come full circle, in all these 3 ways, it becomes clear that creativity holds a supporting role to innovation (Burns, 2013, p.386). This further proves the connection of creativity to innovation and as a result proves also how iteration in video game development can have an effect to both of them. Indeed, by iteration the processing of innovation can be reevaluated, be subjected to changes and even restarts itself if necessary. With such a connection between iteration and innovation now established and by taking into account that innovation and



creativity are connected, the logical conclusion would be that iteration has a similar role to creativity as well.

### 3.4. Project failure in IT development

It is common for video games development that the cost of production keeps increasing, more actually than it was initially estimated (Storz, et al., 2015, pp.124-125). In general, this is a common phenomenon in IT industry as well. Video games are part of IT, so as a result, the same theories that address and dictate IT development, can also be applied to video game development (Storz et al., 2015, pp.124-125). Increase of the final costs can prove to be a strain but it can be excused if the project ends up being successful and generate in return high profit. However, there are cases in which the costs keep rising along with an increase in demand of other resources, even when it is clear that a project is doomed to fail (Keil, 1995, pp.420-422). There are several factors that can contribute to this unnecessary escalation of resources (Keil, 1995, pp.420-422).

There are cases in video gaming development, in which such escalation came to be out of pride from the leadership or management to recognize their mistake or due to uncontrolled iteration. One notable example is the development of Duke Nukem Forever (Thompson, 2009). Specifically, for the case Duke Nukem Forever, the perfectionism of its creators led to an extensive and long development, via continuous iteration process, that ultimately caused the bankruptcy of the developer company (Thompson, 2009). In similar cases, iteration can act as a complicit in giving the project a life on its own. What that means, is that there is a constant drain of resources, commitment of the staff to complete the project and false information about the whereabouts, conditions and prospects of the project (Keil, 1995, pp.420-422).

Video gaming industry's organizations are all project base and as such they are affected greatly in short and long term ways by project failure (Lindahl & Rehn, 2007, pp.246-248).

The term project failure is most often interpreted via managerial lenses (Turner et al., 2013, pp.4-27). The concept of project failures is worth to investigate because this research can reveal the reasons that can cause it. Alternatively, or supplementary, project failure can highlight how a project could potentially become successful (Pinto & Kharbanda, 1996, p.46). In a macroeconomic level, project failures can benefit an organization by showcasing to it trends and preferences of the market, projects to avoid and thus which projects to get the green light and let them develop.

Although in retrospect, it is easy to evaluate which project is prone to fail or shows all the characteristics that will lead it to failure, managers and leaders often hesitate to cancel them or recognize their risky nature (Keil, 1995, p.422).

Factors that individually or collectively can lead to project's resources escalation consist of: project factors, psychological factors, social factors and lastly organizational factors (Keil, 1995, p.422). The multitude of factors proves that escalation is a complex matter and is hard to be analyzed. Also, it showcases that different factors can be intertwined to unpredicted results. That explains why sometimes administration doesn't cancel a failed project.

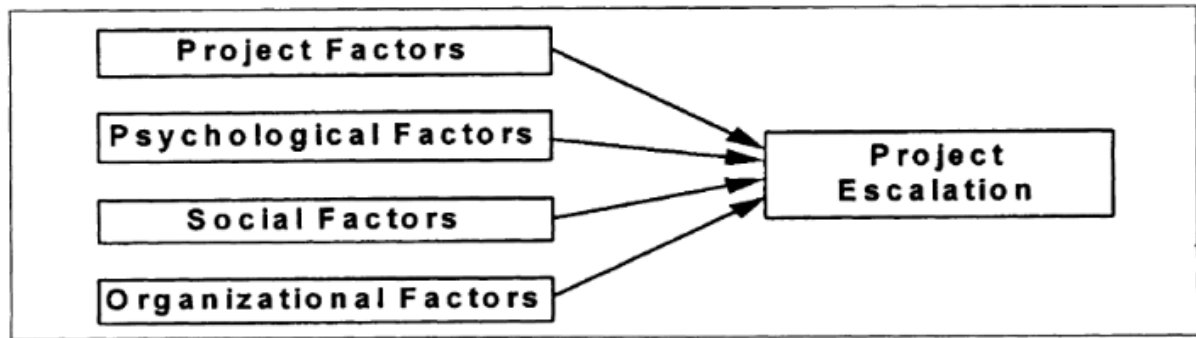


Figure 2, Model of project escalation, Keil, 1995.

But that is not always the case for the indecisiveness and inefficient management that is met in failed project. The most peculiar characteristic about escalation is its nurture by negative information and by the uncertainty of whether the project will reach its goals (Brockner & Brockner, 1992, pp.39-43). Under these conditions of uncertainty, what follows is the strengthening of commitment towards the project.

### 3.5. Project success

Project success factors can be identified by several models. In this thesis, there are going to be employed three different models which showcase similarities to the ones found in the video game industry. The one of Pinto, of Belout and Gauvreau and finally the one proposed by APM. Among them, the most accepted by the managerial community is the Pinto one (Davis, 2014, pp.189-193). That happens because the Pinto model locates factors, which can evaluate how successful a project can be. More specifically, on its turn, the Pinto model is based on the revaluation of previous success factors defined by other researchers (Baker, Murphy, & Fisher, 1988, pp.902-910). Furthermore, Pinto model uses the results of a questionnaire to further strengthen the validity of its own success factors (Vezzoli et al., 2015).

In Pinto model, it is described a 4-phase model (Pinto & Slevin, 1988, pp.67-70). That particular 4-phase model elaborates into the specifics of the life cycle during a project's development. The 4 phases are summarized as conceptualisation, planning, in addition to execution and lastly termination. With the 4-phase model, it is easy for managers to evaluate the success of the project during each phase individually and, after the completion of the project, collectively. The success factors, that are listed below, are used to evaluate the success of the project in each of its phases (Pinto & Slevin, 1988, pp.67-70).

According to the Pinto model there are ten important success factors for a manager to take into consideration, as can be viewed in the Table 1 below.

<b>Factors</b>	<b>Meaning</b>
Project mission	initial clarity of goals and general direction
Top management support	willingness of top management to provide the necessary resources and authority/power for project success
Project schedule/plans	a detailed specification of the individual action steps required for project implementation
Client consultation	communication, consultation and active listening to all impacted parties
Personnel	Recruitment, selection, and training of the necessary personnel for the project team
Technical tasks	availability of the required technology and expertise to complete the specific technical action steps
Client acceptance	the act of 'selling' the final product to its ultimate intended users
Monitoring and feedback	timely providing of overall control info at each phase in the implementation process
Communication	the providing of an appropriate network and necessary data to all key factors in the project implementation
Troubleshooting	ability to handle unexpected crises and deviations from plan

Table 1, (Morris & Pinto, 2007).

Belout and Gauvreau build upon the Pinto model, in order to create another model that would include a stakeholder's perspective like sponsors, project managers and clients (Thi & Swierczek, 2010, p.571). In that regard, success is measured by the degree of satisfaction of each of these stakeholders and whether each of these satisfactions are aligned together. This measurement is achieved by evaluating certain criteria, like technical performance, personal growth, completion of the project, how much satisfied is the user with the project, innovativeness in technical manners, performance of the business, how the project is managed throughout its development cycle, as well as the tendency and frequency of the organization, that is funding a project, to interfere in its management (Thi & Swierczek, 2010, p.571).

To achieve that, Belout and Gauvreau turn the success factors of Pinto model into independent parameters. These independent parameters along with the project's performance then can be evaluated when watching their interaction with the project life cycle, its sectors and its structure (Thi & Swierczek, 2010, p.571).

More specifically, "the project life cycle consists of conceptualization, planning, execution and completion. The types of project structure include functional, functional matrix, balanced matrix, project matrix and project team. The project sector is business or industrial" (Thi & Swierczek, 2010, p.571).

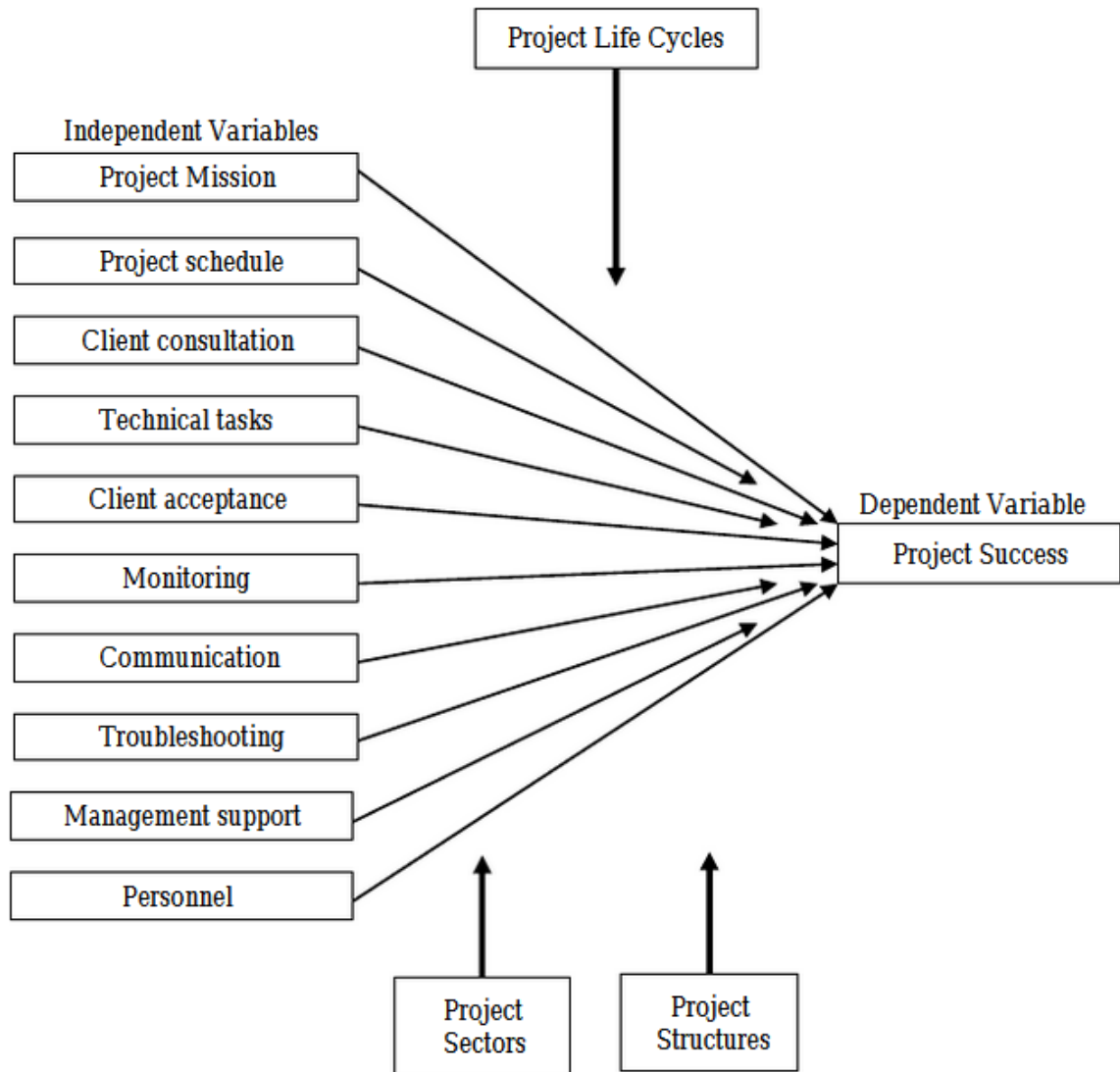


Figure 3, Thi and Swierczek, 2010, p.571 (Belout & Gauvreau, 2004).

There are several other success factors that can be found. But all the researches and suggestions show similarities among each other. For instance, the success factors proposed by the Association for Project Management (APM, 2015) share many commonalities with the ones already established previously in the Pinto model.

The success factors of APM have extra weight and significance in the UK region, from which they originated (APM, 2015).

According to the claims of APM (2015), only a small percentage of projects manage to reach completion and at the same time be successful. More specifically, only twenty percent of them.

In addition to that, among those successful projects, one project out eight exceeded the budget limit and one project out six exceeded the initial appointed deadline (APM, 2015).

APM has identified certain factors that are very important and prevalent to achieve project success. Those are summarized in the Table 2 below and the results are based on eight hundred interviews that were conducted by APM (2015).

In summary, they have been identified as effective governance, goals and objectives, commitment to project success, capable sponsors, secure funding, project planning and review, support organizations, end users and operators, competent project teams, aligned supply chain, proven methods and tools, appropriate standards.

These factors, according to the APM Table 2 (APM 2015), can be analyzed as both internal and external. Internal, because they value the good operation and management of the company's resources from within the company, as well as a good cooperative spirit among the employees and in general the achievement of synergy and alignment among the staff.

External, because there is special significance given to the funding that stems from sponsors outside the company (APM, 2015). These sponsors should be trustworthy for the company that they can actually offer the funding that both parties have agreed upon. The funding should also be given in a steady manner and without irregularity in order to maintain secure conditions for the company's productivity (APM, 2015). Other important parameters are the importance of end users, the customers in other word, who in the end of the day constitute the most important stakeholder in a company, since its products are addressing them (APM, 2015). Good relationships with the supply chain should be maintained for the regular basis of providing the necessary materials a company need or in reverse to deliver the company's products to the customers. Another benefit of maintaining a good relationship with the supplies, can also be viewed as a prevention measure to compete with new competitors in the market (Johnson et al, 2017, p.69). In that sense, there are many benefits for video game developers to interact with their customers frequently and take their feedback into consideration.

<b>Factor</b>	<b>Explanation</b>
<b>Effective governance</b>	This refers to a clear structure within the project itself and supposes a good communication on the part of all stakeholders, focusing especially on leadership, responsibilities and reporting lines.
<b>Goals and objectives</b>	They are clearly communicated, specified and agreed upon by all parties involved. Short-term and long-term goals must logically conclude in the established project outcomes.
<b>Commitment to project success</b>	Everyone involved in the project must remain committed to its success and it is the leader's responsibility to ensure that.
<b>Capable sponsors</b>	Sponsors are the ones that assume the responsibility and accountability for the project's deliverables and therefore they must demonstrate their knowledge and abilities.
<b>Secure funding</b>	The funding's stability ensures immediate action in case the project deviates off-course.
<b>Project planning and review</b>	The project is planned in detail and monitored across its life-cycle to ensure maximum response when variables change.
<b>Support organizations</b>	The environment and stakeholders must be supportive and present access to the necessary resources for the project's completion.
<b>End users and operators</b>	The ultimate consumers and users are consulted during the project to ensure the match between the project and their needs and expectations.
<b>Competent project teams</b>	The team involved in the project must be created from professionals and staff with experience, as this encourages positive behavior, a trademark of success.
<b>Aligned supply chain</b>	Direct and indirect suppliers are aware of the project requirements, the program that is following and the level of quality expected.
<b>Proven methods and tools</b>	Best practices and useful tools are applied in the right context along the project's life-cycle.
<b>Appropriate standards</b>	All stakeholders are aware of the level of quality that is expected from the project.

Table 2, APM model, 2015.

The conclusions of APM research (2015), and in accordance with the Table 2, showcase that effective governance, goals and objectives, as well as commitment to project success are the most important factors that contribute to project success. In particular, effective governance is supplemental to the pre-production stages of a project when managers make decisions and plan for the future of the project. Paradoxically, the goals and objectives of a project may not be specified or defined almost in half of the projects. As a result, any plan conducted in the pre-production stage may suffer and not go as expected (APM, 2015).

### 3.6. Work intensification

Work intensification is a relatively new phenomenon that has emerged due to the effects of globalization (Bamberger et al., 2015, p.322). Managers tend to promote this kind of mentality as it highly increases productivity. However, there are some repercussions by that tactic. The most notable one, being the immense, psychological stress that employees feel when they work under these working conditions (Bamberger et al., 2015, p.322).

The causes that create that phenomenon, as already mentioned, include the management decision to pursue and promote this mentality. Furthermore, intense competition among organizations, internal competition within a company, the global financial crisis and sudden leaps in technology advancement constitute the main reasons of why work intensification has increased in frequency and has become a normality to employees lives (Bamberger et al., 2015, p.322).

Factors than can enhance the intensity of work are “changes in the organization of production, changes in work organization, particularly in regards to increased authority, the introduction of new technology, downsizing that reduces the number of hands without reducing the overall workloads, the introduction of working time reductions without any compensatory increases in new hires” (Bamberger et al., 2015, p322).

Work intensification can be located either as working more hours than contractually someone is obliged to, or to work very intensely without breaks or vacations (F. Green, 2001, pp.53-54). On an additional note, these conditions are not a permanent state. That happens because the human mentality and body don't have the endurance to tolerate these harsh conditions for a long period of time (Bamberger et al., 2015, p.322).

This phenomenon can offer a combination of both negative and positive traits (Peticca-Harris, et al., 2015, p.571). For instance, positives traits of work intensification constitute the increase in productivity and a sense of purpose for the employees. As for negatives, these include psychological stress, sense of angst, feeling of fatigue, the employees have less motivations and don't feel independent to micromanagement their time and work and lastly ,daily pressure to prevail to the challenges of their jobs (Neirotti, 2018, pp.1-2). There is also the possibility that these extra hours will remain unpaid (Neirotti, 2018, pp.1-2).

Also, of significant importance is the fact that many employees work willingly more intense and they are not enforced to do so. There are several reasons for that, for instance they attempt to improve their lifestyle by earning more money or by pursuing a promotion or by differentiating themselves by their colleagues (Campbell & van Wanrooy, 2013, pp.1134-1135).

In video game development in particular, the employees exceed the working expected standard because they feel that they contribute to something artistic (Peticca-Harris, et.al, 2015, p.572). This argument make them feel that there is value to work extra hours and more intensely because it contribute to artistic expression. This extra work for them feels more personalized and the decision to work under these conditions stems often from their free choice (Peticca-Harris, et.al, 2015, p.572).

Working intensification is considered a regularity in video game development and during certain development stages it is a staple to work hard for longer hours (Peticca-Harris et al., 2015, pp.571-573). Iteration in several development cycles requires reworking certain aspects of a game, whereas the deadlines remain the same. For instance, the stage just before the publication of the game include this intensive extra hours and sometimes it can last for months. This phenomenon is so common and unique in the video game industry that it has been given a name, that would be Crunch and it is easily recognized by employees of every layer in the hierarchy of a video game organization (Peticca-Harris et al., 2015, p.573-574).



## 4. Theoretical framework

### 4.1. Theoretical framework summary

In this thesis's theoretical framework, the topic of iteration in video game development will be examined by different angles and perspectives. In that regard, terms, concepts and methodologies about Agile, Waterfall, Crunch and lastly, Video game development stages will be described, explained and analyzed.

All these terms, concepts and methodologies are relevant to the two research questions. Delving more into the specifics of the Agile development creates context to a term that is the main focus of this thesis. Whereas, theorizing about Waterfall model initiates the attempt of this thesis to locate other methods that either could replace Agile methodology or limit/eliminate its feature of iteration. Crunch is a phenomenon that is becoming more frequent in the video game industry and this thesis highlight the contribution of Agile's iteration to crunch's sustainment. Lastly, the theorize in video game development showcases when iteration is visible during the life cycle of a game's development and how this thesis is going to address iteration's presence.

In conclusion, there is not enough academic data and information that revolves solely around the Agile's iteration and certainly the existent researches have not adopted a critical, negative viewpoint to it. That is paradoxical, because the thesis proves a clear connection of Agile's iteration to several negative aspects found in the industry (unnecessary consumption of company's resources, overworking and exhaustion of the industry's employees and suspicions of compromising the artistic integrity of projects). As such, the thesis has located a research gap, in the effects of Agile's iteration in the video game industry and whether it is possible to eliminate it, which this thesis aims to successfully address it.

### 4.2. Agile development and waterfall model

Agile development is granted special notice and appreciation by the software organizations (Strode et al. 2012, p.12). Since video game development belongs to IT, then the same principles which guide the software development, will guide the video game development as well (Storz et al., 2015, pp.124-125). That's why Agile development holds a significant role during the production of a video game.

Agile development gained notice during the 90s and since then has become the dominant model in software development (Dybå & Dingsøyr, 2008, p835). It first formulated as a reaction against the slow pace of other traditional methods, which store a large amount of documents in the end of the development (Perera & Fernando, 2007, p.240). The alleged advantages of Agile development include efficient adjustment to changes, accelerated delivery of the product and a better experience for everyone involved in the software development due to the nurture of teamwork by Agile (Strode et al. 2012, p.12). Another advantage is that it revolves around code development and eliminates extensive documentation (Perera & Fernando, 2007, p.239).

Furthermore, Agile development is considered ideal to be employed by small size teams of 10 or even less members. This feature can be simultaneously an advantage or disadvantage, it depends on the size of each individual team (Perera & Fernando, 2007, p.240). For indie developers, this methodology is cut and dry for them, whereas for AAA developers this methodology can even proves to be chaotic (Perera & Fernando, 2007, p.240).

The recognizable disadvantages of Agile include the overly reliance to specialized personnel (Perera & Fernando, 2007, p.240). That can potentially put a lot of burden and responsibility to certain individuals of the team and potentially delay the development pace. Another issue is the relationship between Agile practice and project management. Agile doesn't advocate any particular project management approach and also doesn't provide any framework of how to achieve the outcomes in the project. Instead, Agile relies heavily on a situational approach of handling the project (Perera & Fernando, 2007, p.240). For more precise information about the intentions and goals of Agile development, a manifesto has been created to communicate the core aims and drivers of Agile. These can be viewed in Figure 4 and Figure 6.

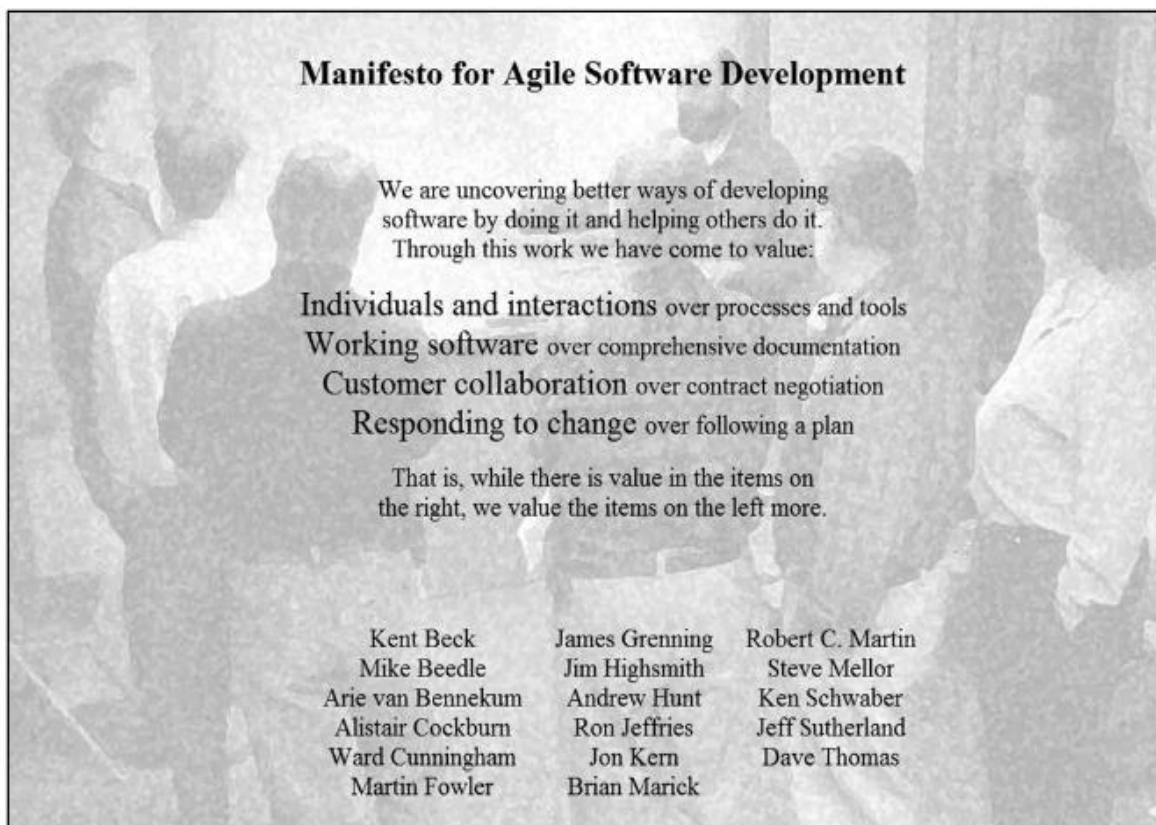
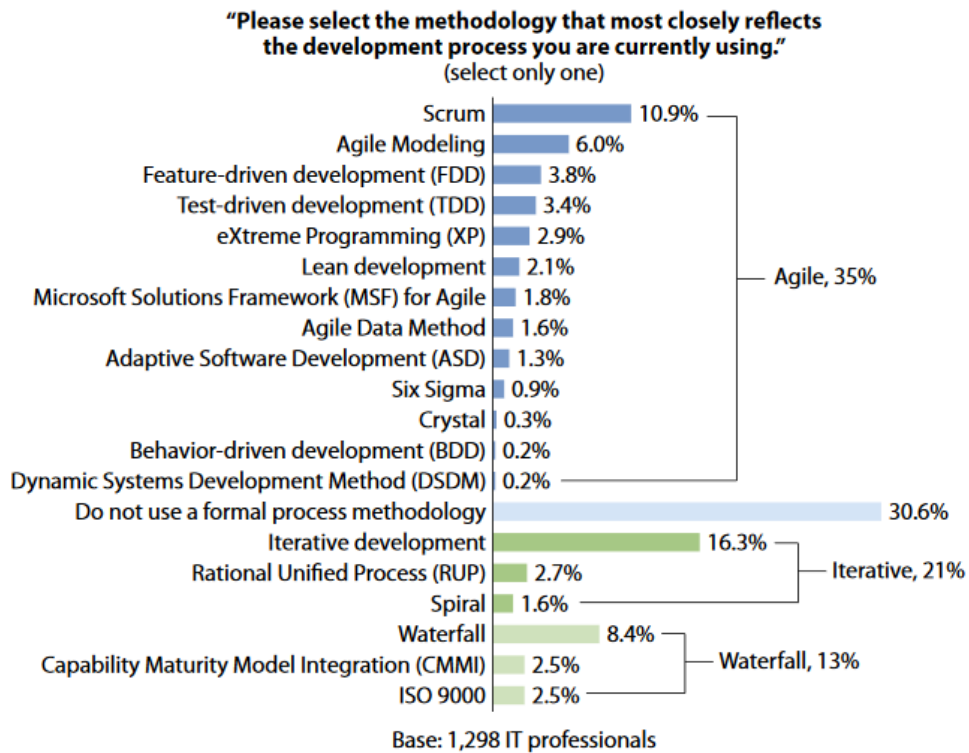


Figure 4, (Beck et al., 2001).




Source: Forrester/Dr. Dobb's Global Developer Technographics® Survey, Q3 2009

56100

Source: Forrester Research, Inc.

Figure 5, Preferred development methodology (West & Grant, 2010, p.2).



## Principles behind the Agile Manifesto

*We follow these principles:*

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

Business people and developers must work together daily throughout the project.

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Working software is the primary measure of progress.

Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

Continuous attention to technical excellence and good design enhances agility.

Simplicity--the art of maximizing the amount of work not done--is essential.

The best architectures, requirements, and designs emerge from self-organizing teams.

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

[Return to Manifesto](#)

Figure 6, (Beck et al., 2001).



Agile tools are usually incorporated in video games through the Scrum method (Dybå & Dingsøy, 2008, p.835). It requires face to face communication between the staff in daily meetings (Strode et al. 2012, p.14). This method takes into account the unstable nature and unpredictability of video games and depends on “empirical control process” (Dybå & Dingsøy, 2008, p.835). More specifically, feedback loops are important when applying this methodology as they provide information to the developers and guide them over what attributes need to be changed or fixed. The software elements are developed in increments, called sprints, by a self-organized group which follows always the same format of actions (Dybå & Dingsøy, 2008, p.835). In the beginning, they plan their action and in the end, they review the end results of these actions. If during development, new ideas about extra features come forward, that have not been included yet, then these ideas are archived in the backlog. With the conclusion of the development, the leader decides whether these new ideas will be featured, in which case a new sprint begins (Dybå & Dingsøy, 2008, p.835). This is the philosophy that nurtures iteration in video game development.

Scrum is the preferred method in Agile because (West & Grant, 2010, p.4):

- It is simple, as it advocates a standard set of roles to be distributed among the staff and allows for the staff to self-organize.
- It is practical, because it advocates daily basis meetings and frequent reports of the progress done. In that way, everyone knows the details of the projects and through the daily meetings, the staff doesn't need to worry that it will fall behind any updates in the project.
- It is popular. The two above advantages are well known to the employees of video game organizations. Furthermore, Scrum is associated with success in the collective conscience, thus to adopt this methodology is considered a safety net against risks.

Iteration is a main component of Agile methodology and is considered as the most common development tactic in contemporary games (Bates, 2004, p.226). Iteration and Agile should be treated as synonymous. Iteration begins essentially after the concept stage has defined the goals and when work in production has already begun (Bates, 2004, p.226). More specifically, the design of the game (and that includes aesthetics and gameplay mechanics) is constantly under surveillance and is refined very frequently. After the end of a development cycle, evaluation of the progress is done by stakeholders and customers and if new features are proposed or changes advocated, then a new development cycle begins all over again and the repetition continues until the product is deemed that looks and plays satisfactorily (Bates, 2004, p.226).

There are other development methods as well besides Agile development, with the second most used named waterfall model. It is widely recognized in the industry that Agile is the more suitable development process, in comparison with other more linear methods like the waterfall model (Bates, 2004, p.225). Some developers prefer to combine the two methodologies as they find useful traits in both of them and they believe that these two methods can act in a symbiotic manner. More specifically, waterfall model can be applied

during preproduction and Agile methodology during production stages. (West & Grant., 2010, p.7 ; Dybå & Dingsøy, 2008, p.837; Politowski, et al., 2016, pp.22-23).

Waterfall model addresses an ideal state in video game development, a state in which everything is coordinate, planned beforehand and with anticipated and predicted outcomes (Bates, 2004, p.225). Supposedly, the production would run smoothly in that state without interruptions and the stages of development would succeed the previous one without the need of extensive iteration. The creation of the system architecture would be immediately followed by putting the details in the design, followed by coding, then debugging and lastly testing the final product before publication (Bates, 2004, p.225).

In summary the waterfall steps are (Bates, 2004, p.225):

- Concept
- Requirements analysis
- Architectural design
- Detailed design
- Coding and debugging
- Testing

The Figure 7 below describes in a more detailed manner the development process of Waterfall model.

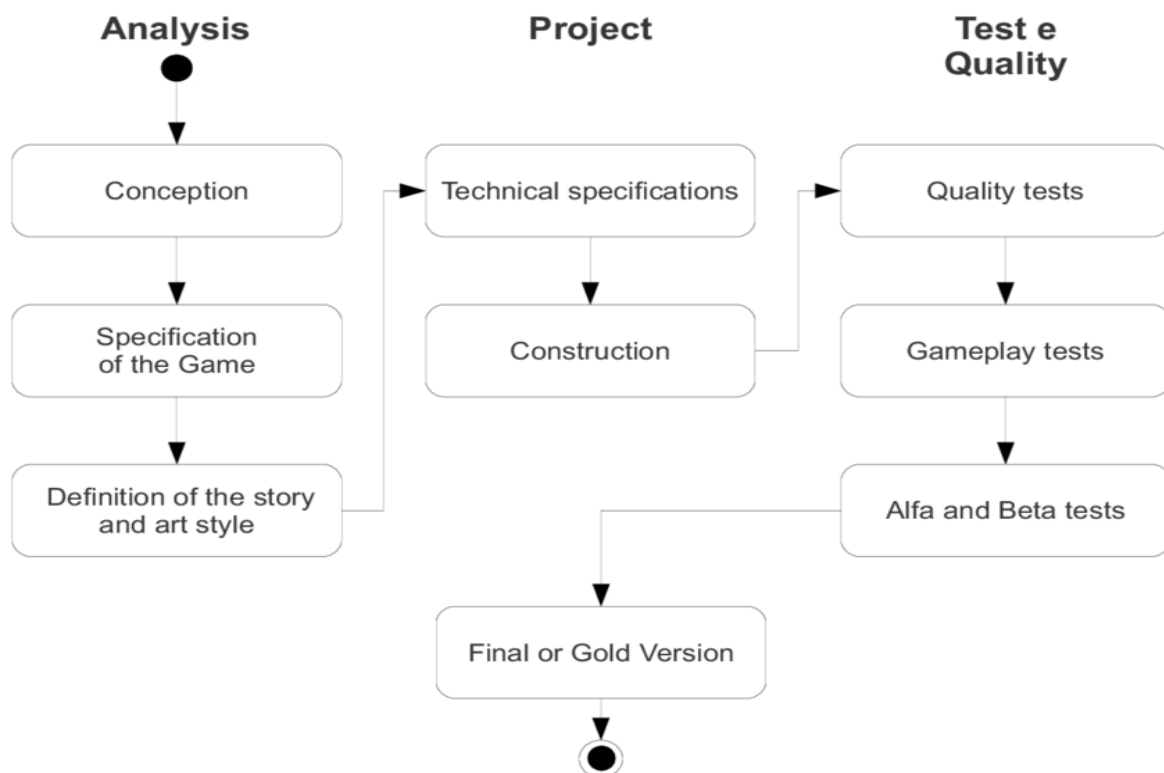


Figure 7, Waterfall process applied to video game development, (Petrillo & Pimenta, 2010, p.11).

However, the reality is that video game development is usually a more chaotic process that can easily deviate from the initial estimations and in the end will not follow a predicted path. (Bates, 2004, p.225). That doesn't mean, however, that is impossible to apply the waterfall model principles to certain cases of video game development. For instance, sequels of a game, in which innovation is limited to the existed and established creations and mechanics or tries to expand them or improve them but not change them, are ideal vehicles to use the waterfall model (Bates, 2004, p.225).

It should be noted that, statistically, managers prefer not to succumb under a certain methodology, its name being either Agile or waterfall etc., and instead deploy a more improvised approach during development, based on the needs of each project. This tendency can be seen in the Figure 5 (West & Grant, 2010, p.2).

#### 4.3. Crunch

Crunch is a usual state for the employees of a video game development organization. This state describes the intense working conditions when the deadline for publishing a video game is approaching and the employees work harder and longer to deliver their product in the desirable polished state (Peticca-Harris et al., 2015, pp.573-574).

In video game industry, the employees cannot feel secure in their job. Indeed, the very nature of the industry is unstable and prone to changes (Peticca-Harris et al., 2015, p.573). The organizations there, are dependent on project to project basis (Weststar, 2015, p.1238). Furthermore, the amount of personnel required for each project is different, that translates as frequent relocations, firing of personnel or rehiring in a different specialty (Hodgson, 2004, p.82).

More unique in the video game industry, is the strong passion of the employees for the content of their work (O'Donnell, 2009). Most employees there really wish to dedicate themselves in their craft and develop the games that exceed the existing boundaries (Slevin P. & Pinto K., 1988). This notion is often exploited by the manager, who promotes to their employees that the reason they should stay and work more is not out of obligation but for idealistic reasons (Peticca-Harris et al., 2015, p.574). This tactic avoids begrudgingly reactions from the employees and creates the illusion of free choice to them, that they work longer hours and more intensely because they chose so. Not only that, but the content of their work should provide them with solace, fulfilment and enjoyment, since it is something they are very passionate about (Peticca-Harris et al., 2015, p.574).

That is the reason, why many employees volunteer themselves to work under these conditions and even expect that this kind of work will rightly remain unpaid (Fleming & Sturdy, 2009, p.570). Also, another factor, that makes crunch a normality, is that the strong bonds among personnel within the organizations are very common in this industry (Sturges, 2013, p.345). The glue that unites these bonds is the mutual love and passion over video gaming. These bonds create a sense of camaraderie among colleagues and further reinforce and nurture the

crunch mentality, because the notion is that in times of crisis everyone should stick together (Peticca-Harris et al., 2015, p.574).

By nurturing this mentality and employing these managerial subtle tactics of submission, the neo normalization of crunch has become an unquestionable reality for the video game industry (Fleming & Sturdy, 2009, pp.571-572). Not only that, but the practices of management to enforce a crunch state, as well as the little pay off for employees for participating in crunch, raise some questions about the ethics and moral values that dominate the video game industry (Sturdy et al, 2009, p.115). Of equal importance, it should be noted, that crunch might backfire. If the reason for crunching is to reach a deadline, fix the final product and make corrections to coding, then extensive overworking might tire the employees so much, that they would be prone to mistakes and create the opposite effect (Bates, 2004,p.230)

Iteration contributes to the crunch phenomenon, as extensive iteration might cause delays and shortcomings. Because of that, reaching the initial set deadlines turns into an unrealistic goal. To elaborate more into that, it is unrealistic to reach the deadline by just the normal working hours, unless the employees dedicate more of their personal time during the production (Peticca-Harris et al., 2015, pp573-574).

Crunch is a phenomenon with many different parameters that can cause its existence. As far this thesis goes, crunch will be examined as a result of iteration. And by extension, crunch will be examined for the effects it has during the development of video games. In that regards, the effects of crunch will be assumed to have originated by iteration.

#### 4.4 Video game development

Software game development differs from the one found in mere software development, mainly because the former deploys interdisciplinary activities (Aleem, et al., 2016, pp.1-2). More specifically, software game development involves the fields of control systems, music, artistic expression, complex human resources and of course artificial intelligence (Aleem, et al., 2016, p.1). After this description, it becomes clear that many stakeholders are involved during the various stages of development of a game.

The definition of a video game characterizes a game as a software application, which provides the chance to its users (players) to interact with its data (Salen & Zimmerman, 2003, p80). Players can make use of the game features and resources, explore the game's environments and fulfil the game's goals (Salen & Zimmerman, 2003, p80).

When creating a video game, a developer should consider how the game can be categorized. Indeed, there are many player modes and genres a game can belong to (Gredler, 1995, p.76-77). That means, that different market segments exist with different requirements each and their customers have a different set of expectations to be meet (Gredler, 1995, p.76-77).

One of the major complexities found in video game development is the involvement of artistic disciplines (Aleem et al., 2016, p.2). These include scenario writing, music, storyboarding, design, refinement of animation, sound effects, artificial intelligent that will



be employed for artistic expression and video production. Not only is the organization of these disciplines important but also how these disciplines can correspond with marketing and ultimately how they can transmute into sales (Aleem et al., 2016, p.2).

A method to organize the development of a video game can be located by adopting a Game Development Software Engineering (GDSE) process life cycle (Aleem et al., 2016, p.2). Essentially, all of the phases of this cycle can be contained into 3 major phases, which are identified as preproduction, production and after-production (Aleem et al., 2016, p.2).

In the preproduction phase, it is examined whether the game scenarios ideas can be implemented. Also, it is examined in the same phase whether the technical requirements of such an attempt can be met (Kaitila, 2013). In the production phase, on the other hand, the focus revolves around making plans, creating documents of the progress and of the whole development process and of course implementing the agreed ideas from the preproduction into the game with graphics and music. In other words, this phase is dedicated to materialize the intended game (Kaitila, 2013). Lastly, in the after-production phase, the final testing of the game is completed before its launch in the market. Other activities, which are included in the after-production phase, are: marketing and the campaign to advertise successfully the game (Kaitila, 2013).

In conclusion and in regards to this thesis, the GDSE life cycle simplifies and summarizes the development phases, although in reality video game development involves more complex stages (Aleem et al., 2016, pp.2-4). The development of each stage can potentially be repeated many times until it reaches completion. Iteration is a usual component found in video game development and the most usual method to initiate and complete development, Agile methodology, nurtures a high degree of iteration (Kaitila, 2013).

Failing to reach deadlines and crunching (working unpaid for more hours when reaching publication deadline) can be viewed as symptoms of Agile development. Video gaming development belongs to the field of entertainment and not in scientific or technological research. As such, the focus goes to deliver a product that will satisfy customers, generate profit and will allow for artistic expression (Kaitila, 2013).

The development of video games is a complicated process that usually is based on the principles of Agile software development methodologies. In these methodologies, iteration held a dominant position, is considered an important factor for achieving high quality and is seen as an integral part of many development stages (Ramadan & Widyani, 2013).

These development stages, as can be seen in Figure 8, are: Foundation (high concept, pitch, concept, game design document, prototype), Structure (design, level creation, programming, art production, audio production), Formal details (testing) and Refinement (before Refinement there might be the stages of Alpha and code freeze) (Ramadan & Widyani, 2013). When the game is ready to be published and released to the customers, sometimes instead the term Gold is used ('the game entered gold phase').

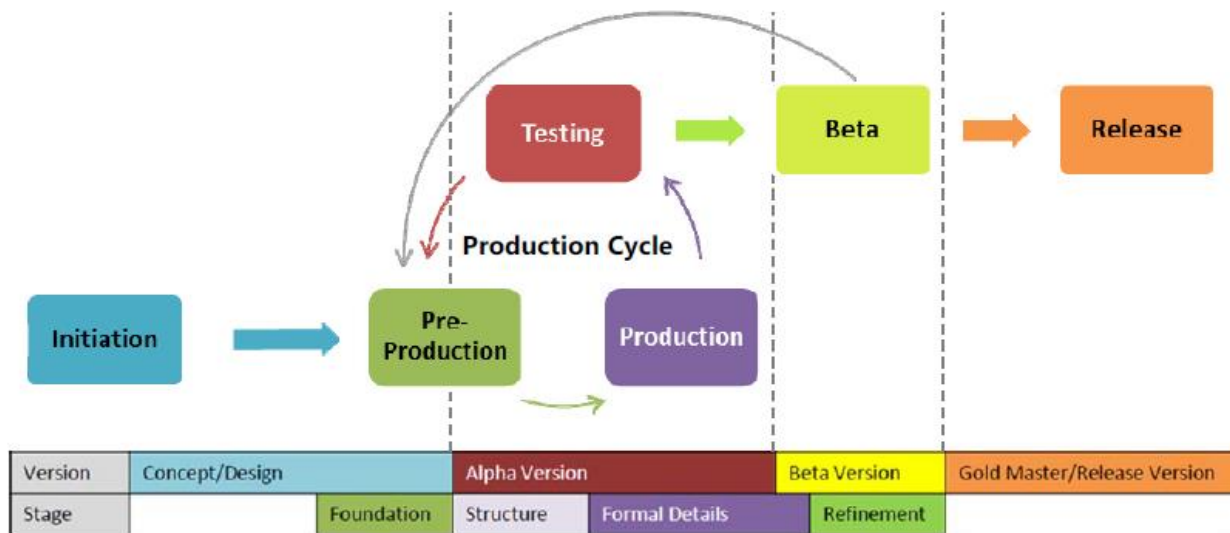


Figure 8, (Ramadan & Widyani, 2013).

For the needs of this thesis, the development stages will be simplified, thus the development of a video game will be described as roughly these three stages (Figure 9). The first stage is the planning stage in which creativity comes forward (Burgess, 2015). New ideas that could possibly be used in a new game and preparations of how to materialize them along with plans of future development. The second stage is building stage, the one where the implementation of creativity, or innovation in other word, happens. The thirds stage is the final stage, in which the game finishes production and reaches the deadline of every development highlight (Burgess, 2015).

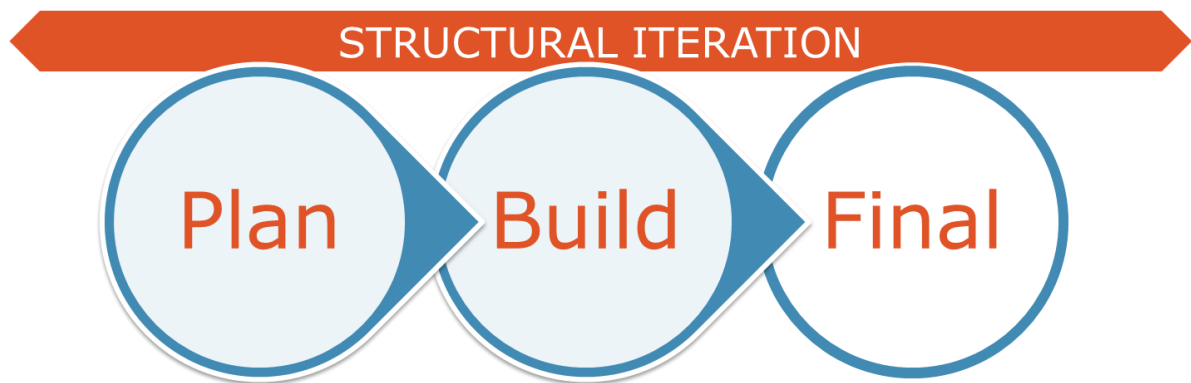


Figure 9, (Burgess, 2015).

Most likely, the development of a game will not run in such a straightforward and smooth manner like it is depicted in Figure 9. What will happen instead, is that the build stage will need to reinvent itself several times and begin production, sometimes even from the beginning. Figure 10 depicts this state (Burgess, 2015). It should be also noted that development issues might enforce the production to begin all over again even from the planning stage.

This iteration is very common during video gaming development (Burgess, 2015). The product is tested repeatedly in all of its layers until it reaches an accepted level of quality from the stakeholders of the project.

Whereas structural iteration focus on the level designing specifically, then qualitative iteration is about the content of the game as a whole (aesthetics, narrative, gameplay, artistic value, entertainment value) and is accomplished via tedious playtesting, receiving and evaluating feedback, (Burgess, 2015). The amount of time dedicated to the task of qualitative iteration cannot be estimated in contrast to the structural iteration. That fact reveals the problematic nature of the former. Furthermore, there are not necessary any specific criteria that should be meet during this iteration process. Instead, iteration finishes itself based on empirical skills and intuition (Burgess, 2015).

The most ideal state, a state that would optimize production and accelerate development in the fastest way possible, would be the one described in Figure 9. That state could offer potentially a variety of benefits (Burgess, 2015). For instance, deadlines, not going overbudget, focus in artistic integrity by focusing on singular goals without deviation.

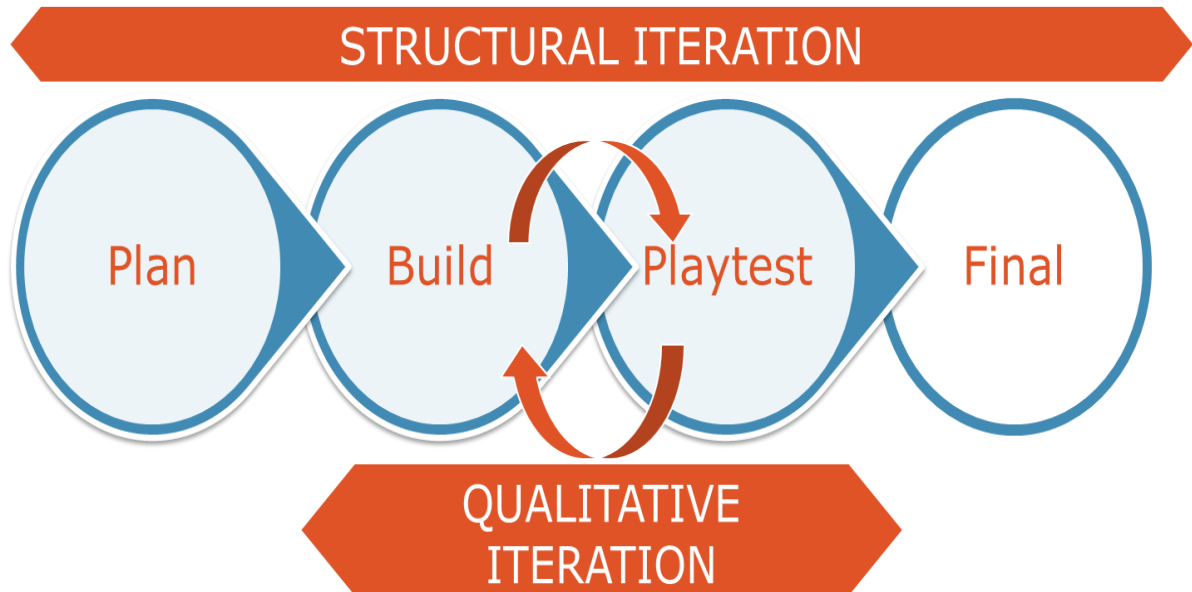


Figure 10, (Burgess, 2015).

Even if the product has reached its final form, the development has not been finished necessarily. In accordance to Figure 11, there is another iteration stage named Qualitative iteration and involves the polishing of the game. Usually that means fixes of bugs (technical misfunctions), correction of glitches (irregularities in the graphical and musical performance) and the final touches in the end product before publication, (Burgess, 2015). This process involves again iteration, customers feedback. Alternatively, the process can be completed even after the release of the product to the public by releasing patches (a set of updates and/or fixes) freely available to everyone.

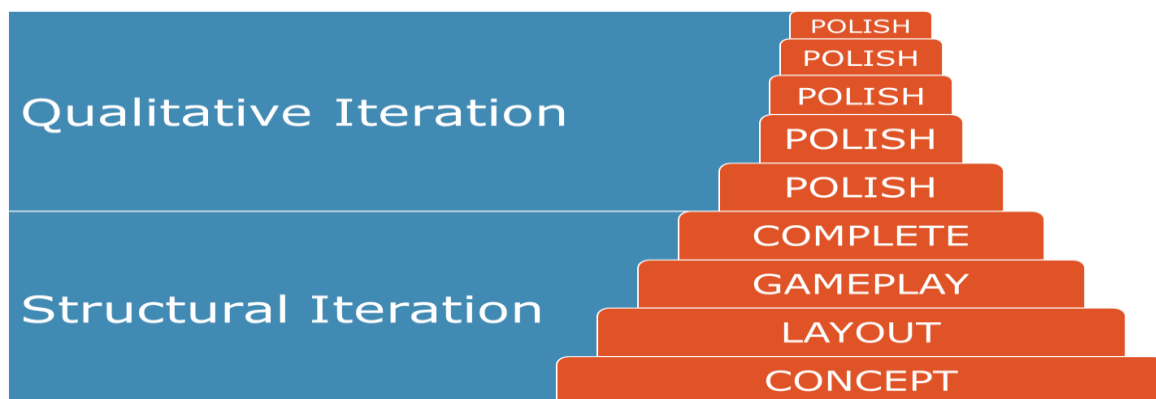


Figure 11, (Burgess, 2015).

## 5. Methodology

This thesis is employing the principles of epistemology to collect its data. By comparing and contrasting it with other research methods (ontology and axiology), it would become clear why this method was the most suitable one for this thesis.

### 5.1. Research methodology

#### 5.1.1. Ontology

Based on Aristotle, ontology refers to everything that exists in the present time, or in other words to everything that exists in the duration of their existence (Munn & Smith, 2008, p.39). Ontology can be distinguished between formal ontology and general ontology. The former would identify objects as specific and with individualistic aspects, whereas the latter would identify not objects but characteristics that all things showcase (Munn & Smith, 2008, pp.44-46).

Based on these definitions, it becomes clear why ontology is not an appropriate method to deploy for this thesis. General ontology would treat iteration and Agile methodology as abstract notions and would fail to highlight their significance in the video game industry specifically. And as far as formal ontology goes, formal ontology is not based on facts and empirical statements before proceeding to judgements, estimations and evaluations (Munn & Smith, 2008, pp.55-56).

#### 5.1.2. Axiology

Axiology is the research towards values (Hart, 1971, p.29). These values can be generally defined as the relationship between an object and the interest of a subject towards it (Hart, 1971, p.31). These values are measured and examined through the lenses of objectivity, according to the axiology's principles. The objectivity is based on the awareness of consciousness and intuition (Hart, 1971, p.33). More specifically, researchers, who identify themselves as followers of axiology, attempt to achieve value objectiveness in their researches (Hart, 1971, p.33).

Due to the given emphasis in documented opinions about Agile's iteration, it becomes clear that axiology is not an appropriate method to deploy for this thesis. Obviously, the author of this thesis has its own bias about the topic. More specifically, the author is against Agile's iteration and his subjectivity to that matter begins and ends with the direction of the research questions. However, the author first and foremost attempts to discover the truth (and as a result to answer the research questions) based not on his own experiences and others individual evaluations but instead based on recorded facts and the convergence of a variety of opinions of other professionals. To allow for the subjectivity of the author or of each of the participants to enter further into the domain of this thesis's research, would jeopardize the validity and significance of the collected data, as the outcomes of this thesis are aimed to stem from the accuracy of the facts and not the individual perspective they are told and shared (Grill, 2017, p.223).

### 5.1.3. Epistemology

Epistemology is the active process of finding the right action in accordance to one's personality, ethical compass, experiences, intelligence and knowledge (Rawwas et al., 2013, p526). Epistemology follows the principles of science, in the sense that it never reaches an end but instead it keeps evolving and exceeding its limits. In a few words, "Epistemology is the branch of philosophy that evaluates competing views of the morality, nature, definition, standards, sources, and functions of knowledge." (Rawwas et al., 2013, p.525).

In conclusion, epistemology is the research method that will be employed as the theoretical backbone when collecting logical and empirical knowledge, as well as when analyzing it. According to Rawwas et al., marketing and managerial research often is associated to epistemology, due to the ethical implications this methodology pronounces (Rawwas et al., 2013, pp.525-526). That constitutes a good reason to adopt this particular methodology for this thesis. More specifically, epistemology explores the different forms and manifestations of knowledge (Cohen et al., 2007, p.7) . The two kinds of knowledge or data, which are used in this thesis, are identified by the principles of epistemology as "Authoritarian" knowledge and "Empirical" knowledge (Feldman, 2004). The former constitutes the interviewees data due to the expertise of the interviewees and the latter constitutes the secondary data due to the objective evidence and multitude of facts that are showcased (Feldman, 2004). Lastly, "Logical" knowledge will be used when conducting the analysis of the data and through common sense, the results of the research will be accumulated into useful conclusions (Feldman, 2004).

## 5.2. Data collection

### 5.2.1. Quantitative vs qualitative research

Quantitative methodology is using primarily numerical data in the form of statistics, surveys and questionnaires in order to support mathematical models and hypotheses (Given, 2008, pp.299-301). This method addresses a small percentage of a demographic which represents the general population. The aim of this methodology is to present objective and unbiased results. In general, it is employed in researches in the fields of psychology, marketing and economics (Given, 2008, pp.299-301). Quantitative research depends highly on mathematics models to produce results, a method that is not suitable for this thesis, since it is based in a relatively sample of data which will be interpreted based on the information this data provided.

Qualitative research will be used for an exploratory research of the thesis topic. Based on individual interviews conducted by the author of this thesis via mail, insights and information will be collected and later used to form conclusions and answer the research questions. Qualitative research attempts to understand reality and filter information through the participants of that research (Gawlik, 2016, p.4). Qualitative research tends to uncover underlying themes that stems from collected data and information from interviews.

Qualitative methodology relies to the collection of data and its subsequent relationship with theory (Bryman & Bell, 2015, p.392). An epistemological approach, which can be called

alternatively interpretivist, attempts to interpret the world via its participants (in the thesis case, the participants are defined as the interviewing subjects) (Bryman & Bell, 2015, p.392).

#### 5.2.2. Types of collected data

This thesis is using, as its methodology, principles from the Intermediate theory (Edmondson & Mcmanus, 2007, p.1165). According to Edmondson and McManus (2007, p.1155), their “Intermediate theory” is ideal to researches in the management field. That’s because it is aimed towards systematic studies, based on collection of original data and also prior work to create new theoretical relationships (Edmondson & Mcmanus, 2007, p.1165). As a result, an inductive approach was adopted (when a theoretical framework is established upon and after the collection data has been completed, that qualifies as an inductive approach (Saunders, Lewis, & Thornhill, 2012, p.124)), as the data collection and its analysis is organized in two layers (Litrico & David, 2017, p.991).

The first layer is the fieldwork data, in which data and information will be collected by interviews conducted from the author of this thesis himself (Litrico & David, 2017, p.991). The questions will attempt to provide a more in depth insight about the workings of the video game industry and will focus strictly on the thesis interest without deviations.

The second layer will provide a more kaleidoscopic view of the iteration topic from different angles and how it can be deployed or be limited in an effective manner. More specifically, the data in that stage will be collected by observing the video game industry events (Litrico & David, 2017, p.991). Case studies, reports, conferences and statements by the industry’s representative will be displayed frequently. Well respected journalistic websites like Kotaku and Gamasutra will provide information in this thesis systematically. The information will be found by past interviews the websites have conducted with game developers or alternatively by the reports or covers they have conducted for various incidents in the video game industry.

#### 5.2.3. Interview design

Interviewing is the best and most accepted and popular option of conducting a qualitative research (Bryman & Bell, 2015, p.479). The interviewees were available all the time, another factor that served as a plus to picking this methodology. Every individual interview is applied through the connections it has to the other interviews and collected theoretical data (Whyte, 1953, p.22). The preferred method of interviewing in this thesis is the semi-structured interviews. This style allows the interview to focus on preplanned questions and better control the flow of the interview (Saunders et al., 2012, p.319-321). The manner of how the interviewees were approached, addressed and informed of their rights, as well as the questions they were asked, can be found in the List of appendices. As a matter of fact, all of the interviewees were asked the same questions (Bryman & Bell, 2015, pp.472-474).

Due to the interviewee’s busy schedule, a compromise had to be reached and in the end it was agreed to conduct the interview via email exchange. The author of the thesis sent his questions and then the interviewees answered on their own capacity and sent via email their answers.

The questions were accompanied together with some necessary explanations and clarifications, so that the answers wouldn't deviate from the topic. With precise answers, the need to repeat the interviews or part of them, is eliminated.

The interviews are constituted of three interviewing subjects, all of whom are project managers in different video game developer companies. The companies are of Chinese origin and are currently located in China. These three companies are specialized in the development of mobile games.

The three interviewees are characteristic representatives of the video game industry and are expected to offer deep insights. That occurs because China has the biggest video game market in the world, more precisely China has been named as the "Games industry capital of the world" (Lanxon, 2017) . Being employees in the biggest market of the world provides thus a status to the thesis's interviewees and gives an extra weight to their remarks.

An interesting remark that was noticed during the preparation of the interviews, was the demanded secrecy requested by the interviewing subjects. Although it is a common place for the interviewing subjects of a thesis to ask for discreteness and anonymity, the insistence of the interviewees and the lengths they went to ensure that these conditions would be fulfilled, speak volumes for the inherent secrecy of the video game industry. Indeed, one of the defining traits of that industry is the confidentiality that shrouds its projects. This level of secrecy is considered normal and is expected due to the highly antagonistic relationships among the video game developers. Another reason, is the need of projects to be based on novel concepts that would differentiate them from the rest of the competition. If that kind of novelty was freely communicated with other company's developers, then other projects might deliver it to the customers faster than the ones which initially came up with it.

A further interesting fact about the interviewing subjects is their current association with the developing of mobile video games. Mobile video gaming is a rather young market, a market that by all accounts gain more dominance in the industry and is preferable by gamers. The interaction technics, for instance, are more immersive than their computer or console counterparts, since the gamer doesn't have to control a controller or a mouse and keyboard to interact with the screen. Instead, mobile gamers interact directly with the screen through touchscreen technology. However, all three interviewees have a diverse experience in the video game industry by working in the past in other companies associated with console and pc gaming. As such, their opinions stem from both their current and their past working experience.

#### 5.2.4. Research's limitations

The limitations of that thesis's research can be located mostly to the strict time constraints that limited the array/range of the research. Also, the usual limitations of qualitative methodologies should be taken into account, that includes that the scope of the findings is restricted (Saunders et al., 2012, p.327). Assumptions have been made that, these few in number interviews can be representative of the whole video game industry. But to contemplate, the research's limitations have been countered by the quality of the theoretical



inferences stemming from the collection of the qualitative data. That supports any assessment of generalization (Bryman & Bell, 2015, p.414).

#### 5.2.5. Participant selection criteria

The interviewing subjects have been selected due to their position as project managers and relevance in the video game industry. Indeed, they are the ones who make critical decisions in the managerial aspect and as such, they are qualified to provide their insights in this thesis (Bryman & Bell, 2015, p.428).

Their experience in the field exceeds five years which provide an extra weight to the quality of their answers. Also, another criteria that was met, was their knowledge of the English language which helped them to understand the questions and provide in depth answers.

#### 5.2.6. Interview's guide and questionnaire

The interviewees, as can be seen in Appendix 1, were informed of their right to anonymity, of the organization that approached them and the reason for the thesis's author of both conducting interviews and also of why he approached these particular participants.

The questions were asked in simple language and in direct regard to the research questions (Bryman & Bell, 2015, p.475). The interviews were conducted in the duration of 10 days. All the questionnaires were sent on 1st December and the last interviewee to answer back did so on 10<sup>th</sup> December. The questions that were asked to the interviewees can be seen in Appendix 2.

#### 5.2.7. Secondary data

Data taken from mass media outputs such as television programs, films and, in the thesis's case, journalistic magazines and newspapers can be applied to a qualitative research (Bryman & Bell, 2015, p.562). Guarantees for the source's credibility can be found when taken into consideration the status and prestige of the magazines that will be referred by this thesis. These sources were deemed as necessary to paint a more detailed picture of the thesis topic and to give more insight for the two research questions from different points of views.

### 5.3. Data analysis methodology

For the section of the analysis of the qualitative data, template analysis was employed. Template analysis advocates to adopt an inductive approach when analyzing the data (Saunders et al., 2012, p.505). Moreover, coding will be used as a way to address the collected data. The codes are created during the analysis of the data and they don't exist prior to that (Brooks et al., 2015, p.203). This type of methodology allows flexibility and adaptability to the thesis, it allows it to experiment with the data before reaching conclusions.

In other words, the author of this thesis had the capacity of testing how the collected data from the qualitative research could be utilized in the most effective way possible and how to support better the topic of this thesis.

The process of conducting the coding was made manually by the author of this thesis. The reason for that, is the relatively small size of the received interviews, which allowed for an

easy management of the collected qualitative data. The analysis will be supported by the data found in the Theoretical framework as well.

The data was easily transferred from the email form to the thesis with only some appropriate edits to them. For instance, only the relevant information towards the thesis topic was kept intact and the rest of the interviews was edited out because it was considered unfit and irrelevant with the thesis's topic. This effect was achieved by categorizing the data into groups and thus reducing in that manner the repetition of the same data again (Saunders et al., 2012, pp.492-493).

#### 5.4. Quality criteria

With the adoption of a qualitative research and more specifically the adoption of semi structured interviews, it is important to guarantee that this thesis covers certain quality criteria, in accordance to the guides of the thesis manual. In essence, the thesis manual advocates that qualitative researches could have a plethora of quality criteria like trustworthiness, transferability, dependability, confirmability, and authenticity etc. in order to evaluate the accuracy and validity of the reported facts and statements (USBE, 2018, p.14). This thesis will evaluate these quality criteria: credibility, transferability, confirmability and authenticity. In general, it is one of the risks of a qualitative research to let objectivity be jeopardized by the authors intents and purposes. However, with these quality criteria fulfilled, this risk has been overcome and the current thesis can claim objectivity and accuracy.

Credibility concerns the compatibility between experience or empirical evidence and the theoretical framework that the research has been established upon (Bryman & Bell, 2015, p.410). Indeed, in this research all of the perspectives and theories that have been asked and examined, allowed for the research questions to be answered thoroughly. Also, it is clear that the results originate from these views and theories and thus validate them.

Transferability address how the collected information could be generalized to represent a larger demographic or population (Bryman & Bell, 2015, p.410). It is widely accepted that qualitative research deploys usually a small sample and thus its transferability's capacities are weak (Bryman & Bell, 2015, p.410). That is the case indeed with this thesis as well. In order to achieve transferability, the author used secondary data to reinforce the effectiveness of the interview's one and to allow the findings and results to reach a more general consensus.

Confirmability address the objectiveness of the research (Bryman & Bell, 2015, p.414). Of course, the author is biased on the thesis's topic and that's why he restricted himself to what the direction of the research questions was going to be. Besides that, the collected data and the findings could provide freely any answer to these questions. In that way, the integrity of the research was maintained and often the results were not the expected ones by the author.

Authenticity is ensured by showcasing fairness and tactical authenticity (Lincoln & Guba, 1986, pp.81-84). In the case of fairness, both in the interviewee's data and in the secondary data, a variety of different opinions, sources, as well as different persons, were presented and in the end used in the thesis to reach conclusions. In that way, it was ensured that every perspective was heard and had the chance to be enlisted during the research. As for tactical

authenticity, the semi-structured style of interviews allowed the interviewees to be flexible and answer the questions in their own knowledge capacities (Lincoln & Guba, 1986, pp.81-84). Also, because the interviewees answered via email when they had the time to do so, the interviewees could prepare beforehand their answers in order to be precise and to not deviate from the asked questions.

### 5.5. Ethical considerations

There are certain rules which expect the protection of the identity of any interviewees and certain actions are expected to be taken to ensure that result (Bryman and Bell 2007, p. 128). More particular, since this thesis was conducted on behalf of the Umea university, the university's thesis manual was used for guidance and directions to that effect (USBE, 2018).

From the beginning of the communication with the interviewing subjects, the interviewees were reassured repeatedly that their anonymity was ensured. Not only that, but also the anonymity of their representative companies would be protected and not revealed at any point in this thesis or its potential publication.

Due to the busy schedule of the interviewees, their wish to conduct the interview via mails and answering the questions in their own capacity, was respected. During the whole process, the confort and serenity of the interviewees were taken into consideration, was prioritized and was never jeopardized.

## 6. Research results

The thesis, as noted already, collected two types of evidence to support its case. Information from interviews conducted by the thesis author and collected data from secondary sources (journalistic magazines and newspapers).

### 6.1. Interview's data

First of all, the three in total interviewees were asked of their own understanding of the Agile methodology and its principles, as well as how Agile compares with other game development technics. These questions were asked in an effort to examine the popularity of Agile development among IT managers.

The next questions in line concentrate on the impact of iteration (a characteristic feature of Agile development) in the internal environment of a video game company, in regards to the second research question. More specifically, there has been collected data regarding to what extent iteration (and in extension the conduction of Agile development) has an impact in three sections (or layers). The abovementioned sections/layers, that this data covers, are:

- Human factor
- Company's resources
- Project's artistic integrity

#### 6.1.1. Level of understanding of Agile methodology

##### **Interviewee 1**

Interviewee 1 seemed unfamiliar with the concepts of Agile as well as the Waterfall method. What the interviewee described however was essentially a circumstantial type of development, in which employees act accordingly to the project in hand.

*1) I am not sure I understand your question. In my department we do management according to the game we are developing. If you ever work as a manager, you will realize that no one follows certain methodologies and labels. In my company, EVERYONE helps to complete the game one way or another and contributes with ideas of how to do it. Managers do not act alone, without taking into consideration the rest of the staff. To make you understand, we use in my company an anonymous box to put our ideas there for various tasks like script, graphics, music, gameplay and we read everything in brainstorming sections. Then we discuss and vote democratically for what is most suitable. We stick then to this plan and build the game around it. We test it until it is made right and working. I hope I answered your question.*

*2) Like I said previously we don't use a standard method to do management. Every game has different requirements and needs to be handled differently. It is important that all the members have a say and can communicate well with each other. We do mobile games in the company and they need small teams. That's why it is important to create strong bonds between each other and let everyone speak their opinion.*

##### **Interviewee 2**

Interviewee 2 and 3 seemed familiar with the Agile and other methodologies in contrast to the Interviewee 1. Interviewee 2, in particular, mentions that Agile is something that is learned in practice and not in theory. That observation can be treated as an indication of the complexity of Agile methodology.

*1) Agile methodology is a staple to video gaming industry. It is often a requirement when you apply for a management position in many Chinese developers. Agile allegedly offers many advantages over other technics. Personally, I believe it depends on the project and on the relations and chemistry of the team.*

*Having said that, it is not rocket science if I may to use the expression. If anything, most of its proposed technics is based on common sense and the most urgent demands of video game industry, like communicating in close contact. Impersonal communication from afar is not very desirable.*

*So, although you can learn and read a lot about Agile from your studies in university, you will learn what you need during your work in the company. In my company, a manager with no prior experience in Agile starts as an assistant and have a mentor who introduces him in such kind of work. I have started that way and I have been also a mentor to new managers. What I have noticed is that Agile is not for everyone. To succeed in Agile, you must be able to comprehend everything around you all the time, you must know every aspect of the development in any field and have quick reflexes. If something doesn't work, you must end it and initiate something different. From my experience, not everyone has the flexibility to adjust to new and frequent changes.*

*I have worked in both console games and mobile games. Agile is the most preferred method in either case. I would go as far as to claim that Agile works even better in mobile games. That's because mobile games are developed by smaller teams. Everyone knows each other and these kind of familiarity builds wonders sometimes.*

*Since I see you are interested in the iteration of Agile, let me say this as well. In mobile games iteration is not so excessive as its console counterparts. The mobile games are smaller in scope, the gameplay mechanics are simpler and the budget is smaller. The pressure to deliver something extraordinary in consoles doesn't compare at all with when you are developing a mobile video game. I have never been in a project in mobile games which went overbudget or didn't reach a desired deadline.*

*2) I have to admit that the only other development methods that I have encountered in video game development is waterfall. Waterfall, if worked in the correct way, can offer more benefits than Agile. For instance, cost reductions and accelerated pace in development. Again based on my experience, I would say that for waterfall to work, certain conditions should be met. For instance, to have lock the budget and development cycles, to have decide what you are going to have in your game when production starts. Usually in games what is the final product and what the initial idea, tend to differ. It is a joke I often exchange with my senior managers, 'If only we could make the game we discussed'.*

*To predict how the final game is going to be from the beginning is not impossible. Mostly, the most demanding parameter is to figure the gameplay mechanics. You can use mechanics that you have worked and tested prior to the beginning of production. For instance, mechanics that programmers test in their own free time or mechanics that have been developed for games and ultimately didn't make the cut. Another method, is you use established mechanics from other successful titles made by other developers. Also, if you are creating a sequel you can just use the mechanics of the previous title to the sequel.*

*Both waterfall and Agile have benefits and disadvantages. It really depends on the game you want to create. I prefer Agile because it is more creative and allows experimentation. But if you know exactly what you want to achieve with a game, then there is really no excuse not to go with waterfall.*

### ***Interviewee 3***

Interviewee 3 makes some interesting remarks about the Agile methodology. Special attention is given to the social implications of the methodology, as the interviewee highlights several times the collaborative nature that Agile requires and the need for good communication skills among the employees in order for Agile to reach its potential.

*1) The methods of Agile are not so complicated to begin with. There is a certain philosophy to Agile, that it's true indeed, however the real question is not whether a manager can understand these principles but whether he can apply them. Agile is a quick moving methodology and requires from the manager to have a grasp of his project. The manager should be able to make quick decisions, to evaluate and have the courage to alter the direction of the project if something is not working or will work better with other ideas. There are no correct decisions but decisions need to be made regardless.*

*Also, it is a must for a manager to be social. In Agile, the manager is always in contact with employees of various departments. You need to learn how to be diplomatic. There are many different ideas floating and it is the responsibility of the manager to not get lost into them and retain the vision of the game.*

*2) That is an interesting question. In my experience as a manager, I prefer using Agile methodology for a plethora of reasons. Firstly, to develop a game is a collaborative process. There are many people involved from different fields such as programmers, writers, musicians, the marketing department. It is not possible to just tell them to do specific things and expect them to just do them. Many employees are highly independent. That is not necessary a negative thing and also they are not stubborn. They have just their vision for the project as far as their respectively field is involved. That's a fact for video game development. Now this is where Agile methodology shines. With Agile, communication is held in high esteem. And I have realized that is an important factor for success. Instead of having all these different visions to collide with each other, Agile allows to explore new opportunities. How these different visions for the games can work. Of course, we cannot implement all these different suggested ideas. Some ideas are just not very good, others while they work on paper, in practice are impractical, others cannot be combined with other ideas. There is also the*

*case when ideas are very good and have good potential but are not just suitable for the kind of game we are making at the moment. As you can see, during development is impossible to satisfy everyone. But communication is the key to achieve alignment with everyone aboard. I have worked in various projects and I concur that Agile works better the smaller the development team is. There can be a great difference between a team of 20 people and a team of 60. I refer to this specific numbers to highlight, how even such a small difference can impact the efficiency of Agile.*

#### 6.1.2. Human Factor

##### **Interviewee 1**

Interviewee 1 indirectly confirms the notion that overworking exists and furthermore that is a result of iteration (for instance ‘reworking is needed’). Her acceptance of overworking as something usual and common in her company confirms the claims that overworking has been normalized in the video game industry and is not an exception.

*3) All the employees understand that the game takes priority and we need to deliver a perfect game. If tests and reworking is needed, then everyone knows that they need to redo their work. When the order to rework certain parts of the game is given, it is explained well to every employee why that should be done that way.*

*4,5) When we work in a game, it is expected that everyone will be dedicated in that goal. This is the culture of the company and the employees. Nobody in the company complains about this situation because they know what they were getting into when they are applying here. But that is not a bad thing, an employee in the video game industry is a special breed of employee. We dedicate our lives for the work we do and we show the utmost respect for the customer. It's because we want to deliver them the best possible product, that we are willing to long extra hours.*

##### **Interviewee 2**

Interviewee 2 admits that overworking exists in not only his current company but also in every other company in the video game industry he has worked in the past. Interestingly, Interviewee 2 hesitates to see a connection of overworking to iteration. Instead, he claims that iteration is merely an expressionistic way for overworking to manifest itself and what is to be blamed is bad management.

*4,5) Sadly, it is true that employees in the video game industry work more hours than their contractual obligations. In every company I have worked and from the experiences other colleagues, who work in different companies, have shared with me, I believe it is safe to say that overworking is a very common phenomenon in our industry. I hesitate to blame iteration however for that situation. Maybe it is the way you constructed your question or because I don't understand its meaning, but iteration is the mediator for the overworking and not the cause for it. In my opinion, overworking is caused by bad management. But even having said that, I can't see overworking getting eliminated in the near future, if actually ever. It is in the very nature of our job in that industry to never have certainties for our tasks. Our job*



*accommodates a level of abstractness which prevents us from making always from the beginning the right choices for our games. Sometimes what we believe might work for our games works, sometimes it doesn't and as a result we go back to the drawer's desk.*

### **Interviewee 3**

Interviewee 3 confirms also that overworking is a staple to his company. He also makes correlations between Agile and overworking, because what he describes as reasons for overworking are most notably displays of iteration (redesigns, rewrites etc.).

*3,4) Everyone is happy to contribute and dedicate to the development, even if that means to sacrifice personal time. All the employees really believe that they are part of creativity and create a piece of art. That's why to belong in that industry you must be highly passionate. I have seen many employees who couldn't handle or tolerate the long hours and decided to quit the job and look for jobs in other industries. That is a very common phenomenon. I don't blame them, there are many sacrifices you have to make and a strong work ethic that is expected to be displayed. No matter how good the job pays (and it's not always the case in that industry) that's not enough. You need to believe that your work has a meaning.*

*5) Overworking hours is a reality not only for our company but also for the video game industry in general. It is considered a norm in our jobs. Of course, there is a connection with iteration but that's only because there is a bad management of setting the deadlines. Some deadlines are too ambitious and cannot be met, especially when programmers need to redesign the levels, composers to compose more appropriate music or new music for the new levels, writers to make rewrites etc.*

*But even if a manager can take into account all these parameters when setting the deadlines, there are other reasons to head for a stricter deadline. For example, the reality is that some publications dates are better than others. It is better to publish during the Christmas holidays when customers buy more games. Or before a major competitor publishes its new hit that may jeopardize the sales of our game.*

*Finally, there is a reason why we want to ship our games as soon as possible. The option of creating a game, having it ready for publication and then wait until the right moment comes, is not a viable solution. The developers, as well as the sponsors of the game, need to recoup the capital they have invested, also you need immediately money to pay your employees. In a few words, when the game is ready you can't wait for the right moment to publish it.*

*For the second part of the question (how the staff's life is affected by iteration), I have already answered it in the section of overworking. What I can add further, is from a practical point of view. Iteration demands from the employee some physical strains. As you can imagine, working in the video game industry means that you look at a computer screen for many hours and that you sit in an office in a certain position for many hours. There are many employees who complain for back problems and have health issues.*

### 6.1.3. Company resources

#### **Interviewee 1**

Interviewee 1 describes that usually her company is planning projects ahead, under certain budget constraints. In the case of exceeding this budget, the staff stays longer hours in work. Iteration is referred indirectly ('rework some stages') as a reason for not reaching a deadline.

*6) When we develop the game, we work with the budget constraints in mind. If we delay to reach our deadlines, we know that we are to be blamed for that. That's why we stay longer in the office without expecting to get payed for that. If we have to rework some stages of the game, that means that we didn't do a good enough job to begin with, so we work more hours to fix our mistakes and to reach our deadlines.*

#### **Interviewee 2**

Interviewee 2 makes a direct correlation between iteration and planning ahead for each project's assigned budget. His company takes the possible effects of iteration into consideration and adjust their schedule around it.

*6) Before the development of a game begins, there is a detailed planning of the budget that is needed. Usually we make assumptions (based on experience) for the final budget and the needed number of staff required to develop the game. And instead of settling down on a definite budget, we create a range of it. A minimum and a maximum. What comes into display as well is the potential profit we hope to make, but let's not get into that. So to answer your question, this minimum and maximum range is created due to the delays of reworking the game in question, or as you define it, due to the delays caused by iteration.*

#### **Interviewee 3**

Interviewee 3 claims that iteration affects the company's resources greatly. He also states that iteration is the cause of many project failures because of exceeding the company's resources.

*6) Iteration can have a major impact to the resources of developers. I have witnessed cases in which the iteration had no ending in sight even if the game had achieved its goals. That is the case of insecurities, when managers and employees have no faith for their product and are not satisfied with what they have created and test it continuously with no clear goal in mind. I have seen also the same results when the opposite mindset occurs. When there is overambition, when they want to create something unique and they have new ideas they want to implement.*

### 6.1.4. Project's artistic integrity

#### **Interviewee 1**

Interviewee 1 describes the need of collaboration among all staff in every department as a necessary parameter when wishing to deliver a good product in the video game industry.

3) *The artists involved in the game know well that they participate in a collective project and that the final product must be something that works well in every area. And to achieve that, everyone should collaborate with each other and understand what our vision for the game is and how to make it happen.*

### **Interviewee 2**

Interviewee 2 makes a clear connection between iteration and creativity. He acknowledges iteration as the glue for artists to understand each other work. He also maintains that in video game industry, collaboration among the different departments of artists is essential to create a good game.

3) *There is a sense of purpose among all the employees in a company, that their work is important. They also believe that their work has artistic merits. With these beliefs it is understandable that any further involvement due to iteration helps to materialize these creative outlets. Unlike writing a novel, a game is created by a team of different artists. It is important for the creation process that all members of the team are aligned together to a common goal. To learn how to collaborate with others, how to accommodate sensibilities of others with your own is part of learning your craft. That describes the mentality of the artists, at least in the company I work to. To return now to your initial question about the impact of iteration in creativity, I would say that iteration can be viewed as an important tool for creators to understand each other's vision of the developing game.*

### **Interviewee 3**

Interviewee 3 seems to confirm the same opinions of Interviewee 2 about the collaborative nature of creativity in the video game industry and that there is no negative effect of iteration towards the integrity of creativity.

4) *As far as creative process goes, let me use one phrase from Antoine Lavoisier 'nothing is created, everything is transformed'. For an artist to return back to his work, is a natural process. Nobody expects that their initial work will be the final draft. The main reason for that is that, no matter how synchronized team members are among each other, an effort is needed to be made until a synergy, of all the parts of a project to align together, is achieved. I have heard complaints here and there about the iterative nature of the work but I didn't get the impression that creativeness is suppressed, rather than that some tasks are too tedious to repeat them so often.*

## **6.2. Secondary data**

The data collected from the secondary sources is organized again in sections/layers, in a similar manner as the one collected from the interviews. This data will add supplementary information to the ones collected by the interview's data, through the already established sections/layers of Human factor and Company's resources. Furthermore, it will provide information which address the first research question of how to limit iteration during development (that section will be addressed simply as Iteration). In conclusion, the secondary data will provide information for these three sections:

- Human factor
- Company's resources
- Iteration

#### 6.2.1. Iteration

1) When trying to limit iteration, a developer company might interact with their audience or potential customers over what they would like to see in a game. With these preferences verified by a majority in the beginning stages of preproduction, there are less assumptions to be made about demographics and what the response of audiences is going to be during the actual production. Thus, less iteration is involved, since the audience has already expressed its interest about the product. There are some methods that could offer this interaction with the customers and they will be examined for their effectiveness.

For starters, Kickstarter is a crowd funding medium in which developers pitch their ideas to the customers, and in case the customers approve it then they will fund it with their own revenue. In that way, the game developers, along with the abovementioned advantages, don't have to rely on publishers for funding. "*Wasteland* creator and Interplay founder Brian Fargo, writes on the Kickstarter page that this was probably the last chance for a *Wasteland* sequel to get made, thanks to consistent disinterest from publishers. [...] Nearly 17,000 backers have already put in at least \$15 towards what is essentially a prerelease purchase for the game, which Fargo says should take him and the team at inXile Entertainment about six months of preproduction and 12 months of active development to create." (Orland, 2012). In a similar manner, "Developer Double Fine managed to raise over \$1 million of funding for a new adventure game project in under 24 hours, directly from tens of thousands of eager fans on Kickstarter. According to Rice, "We've got a lot of fans that have sort of been asking for this for a while {...} So I think it was a good combination of something people were asking for and offered in a way that was unique enough to appeal to people [...] I think it's about having the right idea and if there's a game there that people get excited about they're going to fund it regardless of who's involved". According to Rice the main reason for a successful Kickstarter funding is "You have to have a lot of flexibility and provide (to the customers) a lot of transparency (of what you) do" (Orland, 2012)

Another incident, in which customer-developer interaction can provide warning signs happened quite recently. Blizzard Entertainment (a prestigious video game developer) announced to its fans in a closed conference their new title, *Diablo: Immortal*. What followed was an outcry and negative response to the upcoming product. "Blizzard wasn't ready for the immediate, and overwhelmingly negative, fan reaction to the announcement of *Diablo: Immortal*. And interviews after the controversial press conference indicate that the company may be confused about *why* fans are so angry." (Kuchera, 2018). "Backlash to *Diablo Immortal* has continued to rage across social media, YouTube, Reddit, and other sites since then. It stems, for the most part, from a pre-BlizzCon Blizzard blog post that was meant to temper fans' expectations and clarify that there are multiple *Diablo* projects in the works, but which did say that "we do intend to share some *Diablo*-related news with you at the show." The blog post got many fans' hopes up for even a low-level loot drop of information about *Diablo IV*. Failing that, they were at least holding out for a remaster of a classic *Diablo* game.

Instead, they got a mobile game that's being developed in collaboration with Chinese company NetEase." (Grayson, 2018a)

The above solution (interacting with customers), is going somewhat against the dominant trends of the industry. There are some granted staples in video gaming industry that should be taken into account, when discussing its various development process. Gaming development is protected not by patents but copyrights. The result is that the industry became very secretive (Kohashi & Kurokawa, 2005, p.367). On their own end, consumers are excited by the idea of something with novelty and will potentially intrigue them emotionally (Kohashi and Kurokawa, 2005, p.367). That's why companies put so much emphasis in confidentiality and creativity- innovation.

2) A usual tool used in video gaming development to elucidate the goals and intentions of the final product, is iteration (Reiner, 2018). That essentially means that a developer should redesign, restructure or redevelop the game or a section of the game from an earlier phase of it, which until now was considered an accomplished task. Sometimes, these changes require from the game development to begin from scratch all over again (Burgess, 2015).

There are some preventing ways of that situation to happen. When asked about whether it is possible to limit iteration and speed up the production pace of a game, Warren Spector (a well-known game developer and pioneer in gameplay mechanics) responded, "'What I'm saying is that games - I'm talking about non-sequels, non-imitative games - are inherently unknowable, unpredictable, unmanageable things. A game development process with no crunch? I'm not sure that's possible unless you're working on a rip-off of another game or a low-ambition sequel'" (Tozour, 2015).

"Spyro the dragon" and "Ratchet & Clank" are franchises in which iteration was employed in this manner (Reiner, 2018). About the "Spyro the dragon" trilogy, "' These three games are a great study of iteration. You can see how Insomniac learned from its mistakes, become more ambitious, and figured out how to create a clear through line for players, while still delivering an adventure that pushes for player-driven discovery.'"(Reiner, 2018). The first game was polished and qualified as product of high quality. The developers accepted that they didn't have clarity of the fullest potential of the game and they used the first game as prototype and stepping stone for the next games. Instead of spending time trying to reach the fullest potential of the first game, they published it and then used the lessons learned from that product to the next game in line and the subsequent sequels after that (Reiner, 2018).

There are numerous other examples, of retaining and keep repeating the elements that made a game successful. Franchises like Call of Duty use the same formula and gameplay mechanics for each new title with very profitable results. "'Call of Duty games often rework old maps"' (Doster, 2017), "' staple Call of Duty game modes"' (Doster, 2018), "' classic Call of Duty modes"' (Doster, 2018), "'A huge factor in Call of Duty's success this fall was riding on the quality of the franchise's first foray"'(Doster, 2018).

In a more extreme example, another way to deploy this solution is by remaking old successful games without any change except graphical ones, examples being *Spyro the dragon Reignited* and *Crash bandicoot* (Reiner, 2018).

*Dead Space* franchise is a very fitting example, in which keeping the same aesthetics and mechanics in sequels (and thus limiting iteration) is considered a positive aspect of the game. In the case of *Dead Space 3* (a sequel that differentiate too much by its predecessors), the changes were not appreciated and resulted in a decrease in the sales. “Discussions leading up to *Dead Space 3*'s launch did not come without skepticism from its fans. They feared too much action in favor of real horror [...] I held onto hope. I was confident in Visceral's ability to make an enjoyable game. And they are still great game makers. But the direction that *Dead Space 3* took felt confused. Like it didn't know what it was anymore.” (Amini, 2013)

3) Bethesda's business model allows unpolished games with bugs or other issues to be published because fans themselves are going to fix them (this process is being called as “modding”). “Modifications (or mods, for short) are a huge part of the experience when it comes to previous Bethesda games like *Fallout 4* and *The Elder Scrolls V: Skyrim*” (Kleinman, 2018).

4) Telltale games (a famous series of games that were published through episodes instead of whole games) and *Final Fantasy 15*, 7 (both very famous games from the *Final Fantasy* franchise) use a different business model in which the whole game is not offered at once to the customers. Instead, what happened was that they offer gradually segments of the final game to the public, until all the segments together constitute a complete game. For *FF15* “The four upcoming character-focused pieces of DLC for *FF15* will tie a bow on the game [...] While Tabata (the director of *FF15*) accepts responsibility for *15*'s more controversial narrative decisions, it also becomes clear in speaking to him that the compromises he made stemmed from the realities of the game industry. Publisher Square Enix couldn't gestate the game forever, and it fell on Tabata to ship something.” (Parish, 2018). “the path to being a truly good game (*FF15*) has run through post-launch updates rather than pre-launch polishing [...] With this new content *FF15* really does feel like the game it should've been now. [...] With its Royal Edition update (DLCs) and a top-notch PC port, *Final Fantasy 15* is now truly a must-play game.” (Donaldson, 2018).

As for *FF7 Remake*, according to Kitase, (developer of *FF7* and very prominent figure in the video game industry) “This reimagined epic will be the next core *Final Fantasy* instalment-or rather, instalments,” Game Informer's writer states. “When the project was first announced, people were confused by its multi-part nature, but the goal is to structure it more like *Final Fantasy XIII* than an episodic series.” Kitase adds: “It will essentially be a full scale game for each part of the multi-part series. In *XIII*, each instalment told the story from a different angle. It was kind of like approaching an unknown territory in a sense.” (Hussain, 2016a).

As for Telltale games, according to Job Stauffer (Telltale's head of creative communications) “Being in live development, we always consider the player to be the last piece of the development process. When we kicked *Tales from the Borderlands* off in the end of 2014,

there were characters in that first episode that we've really only fully intended them to maybe be there for one episode. It wasn't until we were playing that game live in front of an audience at the Alamo Drafthouse, where they were yelling at the screen, [that] we saw what the response was to certain characters and certain elements that we maybe didn't even have an idea that fans were going to respond so well to. Having that ability to lean in and say we already know where we started... We know where we're going to be ending. [...] Being able to stay on our toes and adjust the script and adjust certain elements of the story is also a part of our DNA [...] On the one hand, that was us trying to contain ourselves [...] It's not going to land with audiences if we knew already that they don't really like (our decisions) [...] Being able to adjust certain scenes like that, lean in towards the audience and understand what their expectations are''' (Hussain, 2016,b).

#### 6.2.2. Human factor

The studio Rockstar Games is one of the most successful and famous video gaming developers currently in the video game industry. Their policies and business models serve often as a prototype from other companies to follow suit (Macgregor, 2018). That is why the case of their product *Red Dead Redemption 2* is interesting to follow. This case is characteristic of the crunch culture and it highlights the connection of crunch with iteration.

During the development of *Red Dead Redemption 2*, crunch was a very common occurrence and lasted for long periods of time''(Developers) would have to crunch, putting in extra nights and weekends in order to redo these scenes and deal with the rest of the massive workload that was ahead of them [...] ''Dan and Sam Houser, the co-founders of Rockstar and creative leads on *Red Dead Redemption 2*, are renowned for rebooting, overhauling, and discarding large chunks of their games. Through eight years of development on *Red Dead Redemption 2*, the Housers and other directors have made a number of major changes to the story, the core gameplay mechanics, and the game's overall presentation. It's a process that some see as essential for making a game of this nature, but it's also one that leads to a great deal of overtime, and has contributed to a culture of crunch at Rockstar Games that is impossible to deny, according to interviews with dozens of current and former employees. This isn't crunch that came in a burst of a few weeks—it's crunch that, those employees say, has lasted for months or even years.'' (Schreier, 2018).

Indie studios and big studios are both susceptible to the crunch phenomenon. ''''Many teams (indie and AAA alike) seem to start a project *already calculating in* crunch to the schedule for added content or productivity, which is bizarrely short-sighted and disgusting,'' said Tanya X Short, a co-founder at the indie studio Kitfox Games who has also worked in AAA development.[...]overtime is the result of poor planning and bad management, not an inevitable part of game-making.'' (Schreier, 2016). According to Tanya X Short, an Indie developer with prior experience to AAA studios, ''Many teams (indie and AAA alike) seem to start a project *already calculating in* crunch to the schedule for added content or productivity, which is bizarrely short-sighted and disgusting'' (Schreier, 2016).

The main cause of crunch is identified as iteration ''Ask any game developer what the most important part of making games is and they'll likely give you a single-word answer: Iteration.



What that means is experimenting and prototyping and changing your game until you learn what works best. Inevitably, that means throwing out work that's already done, and even more inevitably, that means that an entire team will have to put extra hours into a game. Many game developers see this as one of the reasons that crunch is unavoidable, especially for those at the end of the pipeline. The audio team, for example, can't work until other parts of the game are finalized.” (Schreier, 2018).

Many interviewees in a journalistic magazine have equated crunch with daily overtime, rather than the period prior to reaching a deadline. Characteristically, “ ‘The biggest issue we had was that the lead said ‘Overtime is part of game development’ and never TRIED to improve. As sleep was lost, motivation dropped and the staff lost hope ... everything fell apart. Hundred-hour weeks for nine months, and I'm not exaggerating. Humans can't function under these conditions ... If you want to mention my answer feel free. I'm sure it'd be familiar to many devs.” (Tozour, 2015). “The word “crunch” is something of a misnomer. It implies a short period of time toward the end of a project—crunch time, the final opportunity for everyone to make the game as good as possible. But in the video game industry, crunch can happen any time, for a variety of reasons. Whether there's a big publisher milestone coming up, some executives are coming to town, or the creative director wants to look at a new demo, there are many periods when game developers might have to work nights and weekends to finish big tasks.” (Schreier, 2018).

According to a survey conducted on 2014, over 80% of game developers overworked over the previous two years (Schreier, 2016). More specifically, “81% of polled game developers had crunched at some point over the previous two years. (50% felt crunch was expected in their workplaces and a “normal part of the job.”)” (Schreier, 2016).

According to staff's family members, crunch is affecting in a devastating manner the personal lives of the EA employees (LiveJournal, 2004). A mild crunch in daily basis consists of 8-hours six days per week, whereas a heavy crunch is described as timelines of 9am to 10pm seven days per week. The effects include strains to the physical, emotional, and mental health, as well as a total lack of rewarding the overtime hours neither with extra payment, nor with extra vacation days (Live Journal, 2004).

In the same vein, Sébastien Bénard, an employee in Motion Twin, repeats the same affirmations for the negative effects of crunch and also a warning for the long term consequences. “It leaves people broken and exhausted, and doing little to no work after the crunch” (Grayson, 2018b).

Game developers themselves have confirmed the presence of crunch, with Warren Spector (well respected game developer). “Crunch is the result of working with a host of unknown factors in creative mediums. Since game development is always full of unknowns, crunch will always exist in studios that strive for quality [...] After 30 years of making games I'm still waiting to find the wizard who can avoid crunch entirely without compromising at a level I'm unwilling to accept.” (Tozour, 2015).

### 6.2.3. Company's resources

Duke Nukem Forever is a video game developed by the studio 3D-Realms and is often cited in the video game industry as a classic case of project failure (Thompson, 2009). As the next installment in the successful Duke Nukem franchise, Duke Nukem Forever was envisioned as a unique, modern and completely differentiate title from its predecessors. That ambitious vision was connected to a highly iterative development cycle. The goals of how the game would look and play like were constantly changing and were never clearly defined (Thompson, 2009). The developers were never satisfied and began developing the game in some cases even from the very beginning. In the end, the game was being developed for 13 years and consumed all the company's resources and provided no profit in return (Thompson, 2009). The resulting game was considered of very bad quality and customers weren't eager to buy the product. Although bad and ineffective management along with irresponsible decision making were factors for the project failure, the intermediate for this failure to happen was iteration (Thompson, 2009).

In another perspective, Square Enix (very famous and successful Japanese company) wants to follow the business model of Ubisoft with their Assassins Creed franchise for their Final Fantasy counterpart and produce a title every year. "There has been one major new *Assassin's Creed* game every year since 2007, except for the two years they skipped and the one year when they made two." (Totilo, 2018). Square Enix follows the guiding principle, as the company's mantra, that each new installment in the Final Fantasy franchise should be different and unique from the previous entries. Iteration is involved in other words to achieve this kind of uniqueness and it's taking a toll to the company's resources as the products need many years to be accomplished before they are ready to be published (Yin-Poole, 2011). "When you think of Western AAA titles like Call of Duty, Battlefield, and Assassin's Creed, they seem to work with a lot shorter turnaround - they make a new game in one to two years. That is something we need to follow up, because that seems to be the best way to keep our fans interested and attracted to the franchise.", according to Kitase (important developer in Square Enix) (Yin-Poole, 2011). "Kitase admitted Square Enix "learnt a lesson" from the game's long development, and is happier with Final Fantasy XIII-2, which launches early next year after 18 months of development." (Yin-Poole, 2011).

## 7. Analysis

The collected data for this thesis was divided into two categories. The data based on the conducted interviews and the data based on journalistic magazines and websites. The interview's data will offer data in regards to one research question "How Agile development's iteration influences/affects the development of a game?" and the secondary data will provide insight to both research questions. The research question "How Agile development's iteration influences/affects the development of a game?" will be examined in various layers (Human factor, Company's resources, Project's artistic integrity) in order to provide a kaleidoscopic view to the various dimensions of influence of Agile development in the video game industry. The interview's and secondary data will be compared, supported or contradicted by the data found in the Literature review and Theoretical framework sections in chapters 7.1 and 7.2.

Finally, in chapter 7.3, the data from interviews and secondary data will be intersected together (and not together with the data from Literature review and Theoretical framework, since that process already happened in chapters 7.1 and 7.2) in the topics they both cover which are about certain layers of the research question "How Agile development's iteration influences/affects the development of a game?". These layers are Human factor and Company's resources. These two types of data will be compared together and will be analyzed to produce the findings of this thesis, in accordance to the inductive principles.

### 7.1. Interview's data

In regards to the principles of the Agile development per se, the participants have a different understanding of the Agile development principles. The second and third interviewees follow these principles very frequently in their projects, whereas the first interviewee prefers to follow no methodologies and adjusts every time accordingly to the projects distinctive features on hand. Even so, the first interviewee describes what is essentially the guide principles of Agile. For instance, in the first question the interviewee 1 refers to a regime of retesting their product until it reaches a satisfactorily level, a standard practice of Agile methodology. This kind of understanding of Agile by all participants prepares the research that they will provide a rather homogenous set of answers regarding the insights about the second research question.

#### 7.1.1. Human factor

All interviewees confirm the notion that overworking is a very common phenomenon in the video game industry. It is of especial interest that all of the interviewees are managers, because their answers shed light to how the administration in video game companies treat their employees. They express confirmation to the belief that overworking is a staple to the industry and something that is to be expected from all employees at some point during development. Their responses further support the assumption that overworking in that industry is staring to get normalized. That's a concept that is supported also by Sturges (2013, p.345), who highlights how crunching has become a normal state in the video game industry. More specifically, they acknowledge iteration as being connected to that phenomenon, a fact which further reinforces the negative position that this thesis has against iteration. Iteration

causes retesting and constant repetition of the development cycles. In combination with deadlines that are not given any extension, overworking is demanded often as the only way to reach the management's goals. This remark seems to confirm the claims of Peticca-Harris et al. (2015, pp.573-574), who verifies that the deadlines in video game industry always count to employees working extra hours.

Also, interviewees 2 and 3 confirmed the negative aspects that crunch has to the quality of their staff's life due to physical and mental strains, as well as a negative effect to their personal lives and relationships. These responses correlate with the affirmations of Neirotti (2018, pp.1-2) who claims that overworking can cause angst and fatigue. The interviewees have received reports from their employees complaining for these conditions and they have experienced these effects by witnessing employees changing companies or even industries, in order to achieve a better balance between work and personal life.

#### 7.1.2. Company's resources

All interviewees have identified namely iteration as a cause for exceeding or using a large sum of the total resources of a company. This is a conclusion that also Burgess (2015) has reached in an indirect manner. More specifically, Burgess (2015) claims that the amount of time that is dedicated to iteration cannot be estimated during development. Iteration demands the achievement of a certain level of perfection for the game and often this is an unrealistic goal to achieve, since iteration disregards established plans for development and requires development to begin from the scratch without a plan.

Often, bad management, overambition and vague goals have been identified as the contributing factors which lead the companies to get over the budget, but the reality is that these are symptoms of a common cause, which is identified indirectly by the interviewees as iteration. Indeed, Interviewee 2 has suggested that if the costs of iteration are estimated from the beginning of development, then the risk of going overbudget can be contained to a certain extent. His idea of controlling the cost, is founded on the logic of creating a prediction of a minimum and a maximum array of costs. However, this estimation doesn't help to trim the costs or reduce or stabilize the consumption of a company's resources, rather than help the company to conduct better logistics with their finance before starting development of a game and no unexpected twists happen during development. The same notions about iteration being the factor for going overbudget are supported by Keil (1995, pp.420-422), who states that the lack of proper understanding of the prospects of the project (condition for initiating iteration) can lead to project failure by consuming the resources of a company.

#### 7.1.3. Project's artistic integrity

Every interviewee has highlighted the importance of teamwork and synergy of different departments, as well as the collective goal of delivering a good product in the end. They have also highlighted that the staff is mentally prepared for continuous retests as a normal part of their job. In that sense, they don't feel that changes or questioning of their creative choices is a compromise to their creative vision.

These statements contradict Hodgson & Brand (2013, p.322), who directly blame iteration for compromising the initial creative intent of a game during development. However, it should be noted that the interviewees are project managers and thus maybe they don't possess the understanding of meaning over terms like artistic integrity and artistic compromise. Indeed, the interviewees have explained that synergy and synchronization among the various artistic departments are the sign of creativity, a statement which showcases their lack of understanding over what creativity is supposed to mean.

## 7.2. Secondary data

### 7.2.1. Human factor

Employees in video game industry seem to make an association that the phenomenon of crunch is connected to iteration (Tozour, 2015). They describe the nature of the job they conduct during crunch periods as a process of redoing tasks and retesting their games or implementing new content and material and in general replacing content in the initial game. The same reasoning is also supported by Peticca-Harris et al. (2015, pp.573-574), since polishing a game and reaching it to a state of perfection is the reason for iteration.

According to the collected data, there are many incidents which indicate that crunch is a common phenomenon in the video gaming industry (Schreier, 2016). It is actually considered one of the characteristic features of the video gaming industry and many developers warn potential new employees to think if they can handle the pressure before deciding to work in that industry. Similar conclusions are shared also by Fleming & Sturdy (2009, pp.571-572) and Sturdy et al (2009, p.115), who estimate that this normalization of crunching is a state of submission.

Something else that has been recorded, is that crunch is equated as overworking and working overtime in general, and not only for brief periods of time before reaching a deadline (Schreier, 2016). Some companies like EA or Rockstar consider crunch as a permanent condition when developing games and not as something that might come along the way when development might prove to be demanding (Schreier, 2018). Also, it is quite expected that all employees will work overtime, in other words crunching is considered mandatory and not voluntarily. Another trait of crunching, is that often it goes unpaid and considered as a natural part of the working hours of employees, based not only from the secondary data but additionally on information that the literature review and theoretical framework sections provided. Fleming & Sturdy (2009,p.570) in particular go a step further and claim that employees themselves volunteer to work extra hours unpaid due to loyalty in the success of the project.

There are many negative effects associated with crunch/overworking. There have been several reports describing the mental and physical strains to the employees because of this situation, a notion that is supported by Neirrotti (2018, pp.1-2). Not only that, but also the personal lives of employees are affected negatively by these conditions and the same negative effects are applicable to the quality of relationships that employees in that industry can build over time (LiveJournal, 2004).

Lastly, as noted already, this condition is not considered the exception rather than the rule. Normalization of crunching has been noted by many associates found in the video game industry and demonstrations of these conditions are often not shared with the administration of the developer companies (LiveJournal, 2004). Both Indie studios and big companies are affected similarly by the negative effects of iteration (Macgregor, 2018).

#### 7.2.2. Company's resources

Iteration can restrain the resources and revenue of a company. Storz et al., 2015 (pp.124-125) claims that the same problems found in the IT industry in general, can be found as well in the video game industry specifically and one of these problems include iteration. The case of Square Enix is characteristic (Yin-Poole, 2011). The company has admitted that their current business model and policy are not efficient and are looking for other alternatives. They look, more specifically, towards the policies of other game franchises, in which new games are published every year. In order to achieve that result, they have to settle to specific mechanics and other staples to achieve a limitation of the iteration process (Yin-Poole, 2011).

The case of Duke Nukem Forever serves as a warning of what extreme iteration can cause to a company (Thompson, 2009). Ultimately, a company has to publish its games in order to sustain itself. Iteration is connected to overambition and not clear defined goals of how the final game should look like. These parameters were proved to be dangerous for the management of the company's resources. According to Keil (1995, pp.420-422), psychological reasons, which can include overambition, can lead to project's resources escalation and thus project failure.

#### 7.2.3. Iteration

There are some methods that can be considered when trying to limit iteration. One of them is having a clear vision of how the product should look like, what goals it should achieve and what gameplay mechanics it should showcase.

1) Interaction of studios and their customers can achieve that effect with positive results. For instance, with Kickstarters, customers fund projects they want to play (Orland, 2012). That is an indicator for developers that their ideas and their vision will be accepted and profitable and thus there is no need to make any changes or deviate in any way from the initial plan. In a way, that constitutes a live development, in which customers are always aware and informed of the development of the game and can provide useful feedback of whether they like the direction of the game before it is too late (Orland, 2012). That contradicts the current norm in video game development, in which the game ideas are evaluated during the reproduction phase and only among the stakeholders in the video game industry (Kaitila, 2013).

The example of Diablo: Immortal showcases what can happen when there is no communication with the customer base (Kuchera, 2018). The game is targeted to the Chinese market and as a retaliation, the north America one reacted in a negative manner that might affect long term the franchise. Those early reviews can be taken into account to prevent any

kind of iteration over the direction of the product gameplay mechanics and demographic that the potential game intended to follow as guiding lines.

The above example highlights the possibilities of active and dynamic relationship between customers and developers. If the developers communicate with their customers their ideas about gameplay, aesthetics and artistic, as well as entertainment values, then they can proceed in the development stage in full confidence that their product has been approved by the public and will bring a guarantee revenue back to them. The developers have also a full picture of the product they want to develop from the beginning of production and the end of the development cycle in sight. According to Table 1 of Morris & Pinto (2007), customer's consultation is one major reason to achieve project success, since it can lead to a good communication and better clarification of the demands of the public. The same notion is maintained by Belout and Gauvreau (cited in Thi & Swierczek, 2010, p.571), who put extra emphasis to the importance of stakeholders, including the perspective of clients.

**2)** Keeping the same successful formula or retaining satisfying mechanics and aesthetics seem to keep the interest of customers without any complains and also prove to be a profitable tactic. Some developers despise the idea of sequels or not being innovative however (Tozour, 2015). They think that in innovation, iteration is a necessity. The importance of innovation is also highlighted by Burns (2013, p.383), who claims that innovation is important to overcome the competition both present and future.

The cases of Spyro the dragon and other game franchises provide evidence that customers do not necessary consider innovation as a selling point for them to buy a product or to remain interested in a franchise (Reiner, 2018). This method also helps developers to materialize their vision, in an effective manner for their companies. For instance, instead of one perfect game that will need five years development, why not a franchise that constitutes of 5 games, each needing one year of development? Additionally, from a developer's perspective, the fifth game can be considered the epitome of the developer's vision and the previous four games as the stepping stones to achieve that vision.

**3)** By adopting this business model of letting customers make their own corrections of the game as they see fit, Bethesda seems to try to diminish iteration and accelerate at least the last stages of development, by publishing the game early and leave the polishing to the fans (case of Fallout 76, The Elder Scrolls) (Kleinman, 2018). Indeed, according to Burgess (2015), the final phase before publishing the game carries an abundance of tasks that revolve around polishing the game and this phase can be potentially too time consuming.

**4)** In the case of Final Fantasy franchise and Telltale games, their method of not creating and publishing at once the game, results in making the development cycles to become smaller, iteration to be limited and risks to be minimized (Parish, 2018 ; Hussain, 2016,b). If the public doesn't like the game, then the developers will abandon it and not spend any more of their resources to it. This business model works as a safety net because, essentially, the developers offer a sample to their customers and observe the sales for the product's appeal. This tactic follows the principles of APM research (2015), which advocates the consultant of clients as a primary reason for project success. Belout and Gauvreau (cited in Thi



&Swierczek, 2010, p.571) reinforce this argument by highlighting the importance of listening to the customer's perspective. Another advantage is that this method is more profitable for the producers. They increase the frequency of their output of games annually, they concentrate on one product and thus by investing on the same established aesthetics and gameplay mechanics of the previous segments, the need of iteration is limited (Totilo, 2018). This business model follows the principles and examples of game expansions and patches of the past, in which supplementary content was implanted in the published game in order to add extra content or fixes. This business model offers benefits to both developers and customers, as the development is accelerated, costs are reduced and at the same time the customer's demand for new product is satisfied.

### 7.3. Intersection

The two different types of this thesis data act supplementary towards each other in some areas that this thesis examines. Both interviewee's and secondary data address the second research question "How Agile development's iteration influences/affects the development of a game?", as they provide heavy info about how iteration affects several layers of the development of a video game during its development.

Regarding the overworking, both all interviewees and secondary data confirm the same claims that crunch exists in video game industry and that it is considered a normal practice (Tozour, 2015). Both sources confirm the implications that employees are not working extra hours voluntarily but out of obligation to their company, because it is expected and demanded to overwork. What's more, is that this extra work is often not paid and doesn't provide reward of any kind. Both sources also confirm the negative aspects that overworking has to several parts of an employee's life, such as health and personal relationships. Lastly, directly or indirectly there has been an association between Agile's iteration and the phenomenon of overworking (Interviewee 3).

Regarding the company's resources, again both interviewees and secondary data confirm each other claims, albeit in a different manner. Both sources acknowledge the importance of iteration as a parameter in the company's resources. Interviewees showcase this importance by stating that either their whole budget estimations take into consideration how iteration might affect the development process or by how iteration can create managerial issues, vague goals and extended deadlines with devastating results to the company's resources. Secondary data repeats the same assertions by providing practical examples of both project failures and project successes (Thompson, 2009). In the first case, the devastating effects of iteration are described in detail and iteration is identified as the main reason for the failure, whereas in the second case the project success is credited to the successful attempt of limiting the impact of iteration during development (Reiner, 2018). Additionally, it should be noted that only the secondary data provides direct information about how iteration can be dealt with, be limited or even in some cases eliminated entirely (Yin-Poole, 2011). All interviewees are not concerned with confronting the problem of iteration. However, this behavior can be interpreted as a sign of normalizing the iteration phenomenon in the video game industry. Indeed, this is something that is confirmed and repeated in the secondary data (Tozour, 2015). The notion that iteration is a standard practice in the video game industry is repeated many

times and in general is an established belief in many companies. That is why it hasn't occurred to all interviewees that iteration is not necessary a static or permanent feature of video game development. On the other hand, only the interview's data offers some insight about the relationship of artistic integrity and iteration. The lack of information in the secondary data can be attributed as a validation for the assessment made by the interviewees. Since the artistic integrity is not repressed by iteration and instead is reinforced by it, then there is nothing to report in the journalistic magazines.

## 8. Discussion

In this section, the findings of this research are discussed. More particularly, the two fundamental research questions of 1) How to limit the amount of iteration during video gaming development? and 2) How Agile development's iteration influences/affects the development of a game? are answered thoroughly and discussed in a detailed manner.

The concepts discussed in the literature review, along with detailed information found in the theoretical framework will be employed during the finding's discussion. This section has been organized by reviewing the findings in regards to the two research questions.

### 8.1. How to limit the amount of iteration during video gaming development?

The information collected to answer this research question stems mainly by the secondary data. This data includes reports and interviews from respected journalistic magazines, like Kotaku, and websites. Iteration was mentioned and tackled in a subtly manner by them and that behavior can be considered expected, since iteration is normalized in the video game industry. Sturges (2013, p.345) also supports that steadily the mentality of overworking in the video game industry is becoming a staple. Alas, there were many video game developers who nevertheless, without condemning iteration or identifying it as a problem, proposed effective solutions, like Kitase for FF7 Remake (Hussain, 2016a).

These solutions are not mere assumptions or hopeful thinking, they are based on actual facts and have been put to practice and proved to be successful in limiting or eliminating iteration in rather unique ways.

These methods, depending the situation, demand the reliance of developers either to already established franchises or to successful mechanics and aesthetics found in previous, unrelated video games (Doster, 2018). For instance, sequels of the games can just build upon the previous titles mechanics and expand on them (Reiner, 2018). Another solution is that a good enough game can be published and then the sequels can use the exact same mechanics and design choices until the last one reaches the fullest potential that was initially envisioned for the first title (Reiner, 2018). These solutions accelerate greatly the development and publishing pace and allow the companies to put in the market more products of a good quality in a faster pace.

Furthermore, another alternative solution is to increase the interaction of developers and customers to such an extent that developers will seek constantly how customers react and respond to choices about the game during the development. The concept of alliance with the customers may seem paradoxical at first, since it is not a practice that the majority of companies do, but this new practice offers many advantages as can be seen in Table 1 (Morris & Pinto, 2007). More importantly, constant interactivity with the customers can provide feedback that will prevent the need of retesting or trying to guess the tastes of the audience, thus limiting the need of iteration.

There other types of interactions with customers or in other words allying with them. For instance, customers don't have to interfere during the development of the game, a method

that will alleviate the frustration of some developers who might feel that their work is compromised. Instead, customers can have the opportunity to receive the game in such a state that they can construct it to their own image, with the features they want to see. Thus, without the need of polishing the game, the developing company doesn't have to conduct the time consuming qualitative iteration in the last stages of development (Burgess, 2015). Such is the case of Bethesda, which has pushed the boundaries of interacting with the customers even further, as the company publishes games with clear problems and deficiencies (and at the same time rich in context and gameplay value) and leaves their corrections to the customers themselves by enabling the customers to do modifications to the games (Kleinman, 2018). Alternatively, a game can be published in fractures or episodes until gradually all the episodes will constitute a full game (Donaldson, 2018 ; Hussain, 2016b). In that way, the production pace of products is accelerated and the developers spend less resources for a small size product. In that regards, a small size product demands less iteration to be materialized. The developers can also evaluate the commercial reception of that small size product before they proceed to develop the other episodes or in other words before they dedicate the resources to formulate a fully-fledged game.

## 8.2. How Agile development's iteration influences/affects the development of a game?

This data stems from both the conducted interviews and also the collected secondary data. Through the intermediate theory, these different types of data act supplementary to each other.

It is important to note, the level of understanding of Agile methodology by the video game industry's associates. One important finding is that the Agile methodology is widely used by many developers in the video gaming industry (Bates, 2004, p.225). Interviewees 2 and 3 support that notion and the secondary data also provides confirmation towards that conclusion. The Figure 5, found in the theoretical framework, provides data as well confirming that Agile methodology is the favorite methodology of managers in video game industry (West & Grant, 2010, p.2). Agile is viewed by managers as ideal to develop video games and it turns into a staple in the industry. What becomes also staple in the industry are the characteristic features of Agile like the examined iteration in this thesis (Dybå & Dingsøyr, 2008, p835). In that sense, it becomes clear that the extensive adoption of Agile methodology results in the extensive adoption of iteration as well. This observation supports the significance and validity of that research question, by proving that the Agile methodology is becoming mainstream. The effects of Agile can be seen frequently and will be seen more often, the more developers decide to adopt it (Strode et al. 2012, p.12).

This research question has been examined in several layers of video game development. Namely, the maintenance of artistic integrity, the employee's quality of life and lastly, the company's resources.

For starters, a finding, according to both the data collected by all interviews and secondary data, is that crunch is connected to iteration (Tozour, 2015). And considering the negative effects that crunch is causing to the employees, that serves as another proof against iteration.

The notion that crunch is the result of bad management is supported by both interviewees and the secondary data. This also supported by Fleming & Sturdy (2009, pp.571-572). Developers believe that overworking is a standard practice in the industry, a mentality that leads to normalize the practice of crunch. That normalization makes any attempt of opposition against overworking very difficult, as employees believe that they have no right to oppose it (Deuze et al., 2007, p.349 ; Dyer-Witthford & De Peuter, 2006, pp.607-610).

Crunch has been often associated as an essential element to publish a well-developed game and has been considered an integral reason for the huge financial success of many AAA titles. As a domino effect, crunching in AAA studios projects a supposedly successful business model prototype for indie studios to follow (Macgregor, 2018). In that way, all the video gaming industry is affected by this policy, no matter the size and scope of the company (Schreier, 2016). In that regard, Agile development (and thus iteration) is not necessary the best management methodology as it is widely considered. Crunch has negative effects to the staff's quality of life, to personal relationships, mental and physical health and in the productivity level that employees can generate (Bates, 2004,p.230).

Iteration has been found to be connected to the management of the resources of a company (Interviewees 2 and 3). Simply enough, the longer the iteration, the larger the costs and consumption of a company's resources. Iteration can affect the sales of a company in another perspective, as the case of Square Enix has shown (Yin-Poole, 2011). More specifically, it can affect the selling power of a company, since by not providing to the market enough products, the revenue in return is going to be smaller (Yin-Poole, 2011). It should be noted that project failure is not necessary a result of managerial incompetence but it's due to the nature of iteration. Agile's iteration commands and proclaims essentially that employees should never settle to staples and commonalities and demands constant experimentation to achieve uniqueness. This mentality goes against the best interest of any company to make profits (Thompson, 2009).

According to all interviewees, iteration is not affecting the quality of creativity. The decision making in that area is mostly a collective process that takes into account both creative sensibilities and also practical issues found often in the video game industry, like whether some choices have an appeal to customers or that the creative vision is not static and constantly evolving and changing in accordance to the development of the video game. This is an important finding in this thesis, as artistic integrity constitutes the only layer of development that is not only unaffected by iteration but in return is enhanced by it. It seems to be widely accepted by developers, that constant retesting and the benefit of more time adds value to the artistic vision and more chances to realizes itself. This finding contradicts the findings of other researches which claim that artists resists the principles of Agile due to concerns over restricting their creativity (Hodgson & Brand, 2013, p.322).

## 9. Conclusion

### 9.1. Summary of the findings

This thesis is associated with the relationship between Agile development and the companies (along with their employees) of video game industry. Agile development is widely used in IT companies, so it is no wonder that it is also a favorite methodology of managers in the video game industry as well. The most prominent feature of Agile that has been examined throughout the thesis, is iteration. What has been examined more particularly, are the effects of iteration in several layers of the video game industry and whether Agile's iteration can be replaced.

Namely, these layers are how iteration affects the quality life of employees, how it affects the company resources and whether it interferes with the creative powers and vision of the project.

The quality of life of the employees is influenced by the existence of iteration, as it often demands from them working overtime unpaid. The stresses of such a lifestyle can affect them physically, mentally and in a personal level.

Company resources are not spared from the iterative process and there are often consumed by mismanagement and behaviors found more frequently in the Agile methodology, rather than other management techniques.

Artistic integrity is not only unaffected by iteration but it can actually be enhanced by it, since constant retesting can clarify the creative vision and strengthen the bonds among the collaborative departments of a video game studio. In general, artistic integrity is not foreign to the collaborative nature of video game development in general.

As a countermeasure to iteration, there are some methods suggested in this thesis to try and repress the iterative process. Encouragement for developers to abstain from confidentiality and secrecy, can lead to dynamic interactions with customers and developers throughout all stages of a game's development. Customer's feedback can act in such a way, that the risk of crucial decisions during development being not effective and relevant to the product is minimized. In certain cases, customers interference can reach such an extent that customers can involve themselves directly to developing the game with no cost repercussion for the developers.

Furthermore, investing more to establish a franchise rather than stand-alone titles can limit iteration. By reusing successful mechanics and aesthetics, there is no need for experimentation.

Publishing games in an episodic format can reduce the costs and at the same time provide feedback to the developers from the customer's base. If a full developed game would cost X amount, then developing and publishing one fifth of that game would cost  $X/5$  of the total amount and the sales and feedback from the customers would be an indicator if it is worth to develop the rest of the game. By keeping the scope of the game small, then iteration is also limited, since there is not enough content and the development is easier to control.

In conclusion, one of the biggest challenges of a project manager in the video game industry is how to eliminate, limit or/and control the iteration process and accelerate the pace of the project.

As far as this thesis purpose goes, the thesis provided many valid reasons to create a case against Agile's iteration as mentioned above. Also, as can be seen in the chapter 9.2 and 9.6 the thesis's purpose, of investigating a unique topic and of endorsing further research in the video gaming industry by highlighting possible future topics for researchers, has been fulfilled.

## 9.2. Theoretical contribution

The research of this thesis adopted the rather unique approach of intermediate theory, which combines two different types of collected data. Since this theory is considered appropriate to use in managerial research, hopefully this thesis will encourage other researchers to adopt a similar methodology. Intermediate theory and inductive research were especially helpful in this thesis, as they allowed two types of data to be collected, be compared with each other and be intersected during their analysis. This is especially significant, since the sample of interviewees was rather small it could be reinforced by the collected secondary data and together provide enough backup for the arguments developed in the thesis.

This thesis examined the video game industry, an industry that is not so well researched in the academic world, as it is relatively young to the market in comparison to other industries. Another reason that this industry is not researched, is because it has been considered as a part of the IT industry and not as independent. That is why very often researchers ignore it and instead approach it in a more generic scope. Furthermore, more specifically, this thesis is examining the importance of Agile development in the video in video game industry. So far, Agile has been analyzed as a methodology used in the IT industry in general and not based on the special circumstances found in the video game industry in particular. The present thesis differentiates by examining the dynamic relationship of Agile in that industry, how it affects it and whether it can be replaced or be improved.

## 9.3. Managerial contribution

This thesis offers an alternative perspective on the perception of Agile development. So far, Agile development has been reviewed for its alleged advantages it offers in the development of products not only in the video game industry but in the IT industry as well in general. What should be noted is that Agile has been hailed not for its own merits but instead, because it has been favored in comparison with other management technics. However, there are reasons to believe that Agile (especially one of its characteristic features, iteration) creates some important obstacles and constrains during the development of a video game. These reasons include overworking of the staff and fast consumption of the company's resources.

There are not many published works that are associated with Agile development and its significance in the video game industry. What published work exists, concentrates more on the effects of Agile development's iteration, like the phenomenon of crunching or the project failures in some cases due to mismanagement of the company's resources.



For these reasons, this thesis takes a stand against Agile's main feature, iteration. Indeed, the thesis provides reports and facts that strengthen that position and highlights the problems caused by iteration. A direct association between crunching, the management of company's resources, the product's artistic integrity and iteration is established. More importantly, the thesis doesn't stop there, it also advocates viable and reasonable arguments to alternative solutions which can be taken into consideration in order to confront the problem.

#### 9.4. Societal implication

The results of this thesis showcase that Agile's iteration affects in a negative way the personal lives, the quality of human relationships and health of the employees in the video game industry. These implications raise serious concerns about the employee's welfare in that industry. Assumptions can be made that this relatively young industry do not possess the appropriate legal framework to ensure humane conditions for its employees and the means to protect their rights against overworking, demanding bosses and unpaid work.

Another serious concern is that there is no acknowledgement that Agile's iteration is connected to these conditions. Instead, these symptoms are treated as causes and as a result there cannot possibly be established an effective solution against these serious issues.

Lastly, it seems that overworking in the video game industry is considered as something normal and to be expected. The interviewees, managers themselves, describe these conditions as a normal day in the industry and further suggest that only a special breed of employees can endure these conditions and overworking, or crunching in other words.

#### 9.5. Limitations

The scope of this research has been limited by the time constraints it had been given to be written. Another limit is the small sample of interviews that has been collected. As the total number of interviews was only 3, the sample cannot be considered enough to provide safe assumptions and conclusions. The use of secondary data, stemming from journalistic magazines and interviews from other sources, helped to compensate for this defect.

This research has been concentrating on one particular feature of Agile development, that of iteration. However, for a full and complete examination of the Agile methodology there are more aspects of it that should be examined and explored.

Lastly, the usual limitations of qualitative research have been encountered in this thesis as well. As mentioned already, the number of samples was relatively small and that jeopardizes to a degree the effectiveness of the qualitative methodology. Not only that, but the subjectivity of the interviewees need to be taken into consideration when evaluating the validity of their claims. As a counterpoint, the claims of every interviewee seem to validate each other.

Furthermore, another limitation was due to the hectic schedule of the interviewees. A compromise was made, that the interviewees will answer the questions in their own capacity via emails. The benefits of that action include thorough and prepared answers to the questions. On the other hand, the disadvantages are that in case the answer is avoided or

deviates from the initial asked question, the interviewer has not the chance to ask for clarifications. Luckily for this thesis, the interviewees provided focused, coherent and to the point answers.

#### 9.6. Suggestions for future studies

Hopefully, the results and conclusions of this thesis will encourage other researches to conduct more direct and thorough investigations into the Agile development's implications to the development of video games. Alternatively, this thesis might encourage others to adopt a more critical view against the Agile development principles.

The relationship of Agile methodologies with the video game industry is influenced by several parameters that are worth to be investigated in the future by other studies. For instance, the same topic that this thesis has examined, can be researched via other methodologies, like quantitative research or even qualitative research of a larger caliber than the one conducted by this thesis in order to produce more effective results.

Also, this topic was examined by a managerial angle. Maybe other perspectives, like a financial approach, can shed more light into the effectiveness of Agile.

In conclusion, this thesis attempted to put in the spotlight the video game industry. Academic research is rather reserved when trying to investigate this industry, which is understandable because it is still young and doesn't offer a lot of data to be studied. This thesis closing lines express the sincere wish that it managed to offer clarity over some specifics of that industry and sowed the seeds for further researches revolving around video gaming.

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## Appendix 1, Interview's guide

Dear Sir/Madam

My name is Ioannis Stylianos Archontakis and I am currently a university student in the Umea university. The reason I approach you is for the benefit of my dissertation with the topic of Agile development in video game industry and more particularly how its iteration affects the development of a game.

My methodology of choice to research this topic is qualitative and that's why I am looking for employees, preferable managers like you, in the video game industry to conduct interviews with them and offer me analytical insights for the subject.

The way to conduct the interview is flexible and will adjust to your own schedule for your comfort. We can conduct the interview via email, Skype, Facebook communication, Viber, What's app or with your Chinese app We chat, it's a matter of your convenience.

Let me reassure you that it is the policy and legislation of my university to maintain the anonymity of the interviewees even in the case of publication.

I sincerely thank you for your time and hopefully we will collaborate in the future. Please feel free to ask me for any clarifications.

Sincerely yours,

Ioannis Stylianos Archontakis

## Appendix 2, Introduction letter to respondents, Questions for interview

Hello,

thank you very much for your participation in the completion of my thesis. At your request, the interview will be conducted via email communication. Furthermore, let me declare and clarify that your interview will be used solely for the purposes of my thesis and might be published as an academic paper in the Umea university network. Your anonymity, as well as the anonymity of your company, will be maintained in any case.

The topic of my thesis revolves around the iteration that is often encounter during video game development. When I say ‘iteration’, I mean the tendency of development cycles to repeat themselves until the desirable results are reached, like good gameplay mechanics, functional multiplayer mode, good graphics, immersive aesthetics etc.

*Agile development:*

- 1) -How easy is agile development methodologies to be understood by managers?
- 2) -How does agile development compare with other methodologies like waterfall model etc.?

*Iteration and the human factor*

- 3) -What are the sentiments of your artists towards iteration? (Please follow the guidance of the follow supplementary questions before you answer:  
-Do they feel that iteration help them clarify their creative vision?  
-Do they view it alternatively as an obstruction of creative expression?  
-Do the initial creative intentions and vision remain the same in the end of the product or is it transform due to the iterations?  
-How does iteration address the individualism of artists?)
- 4) -Sometimes, the developers of a video game are overworking themselves more hours than required. Do you believe that iteration is connected to this phenomenon?
- 5) -How does iteration help the project, how does it affect your staff's quality life?

*Iteration and company's resources*

- 6) -What is the impact of iterations to the resources of a company? Is it possible to predict and estimate the spectrum of financial resources before the start of development, when iteration is involved?

Thank you for your cooperation.

Sincerely yours,

Ioannis Stylianos Archontakis



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