THE DESIGN OF INDIE GAMES, A DIFFERENT PARADIGM

by

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Dedicated to

Koala

and

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SUMMARY

This dissertation explores thoroughly the design of the so-called indie games. It portrays in detail the design activities undertaken by indie designers and the design context in which indie games are devised. With this knowledge, a comparison with game design as it has been formulated by academics and game industry veterans is undertaken. This with the purpose of finding out if the design of indie games represents a different paradigm in regard to game design.

This work takes the reader through a series of chapters providing the epistemological context to analyze comparatively the design of indie games and game design. The indie games movement is defined and contextualized within indie cultures and put in perspective in relation with mainstream games. The historical and theoretical foundations of game design are also covered. And to get an understanding around what designing implies, theories from the disciplines of design, engineering, architecture and product design are explained.

Thirty award-winning designers of indie games at *Indiecade* and the *Independent Games Festivals* of the *Game Developers Conference* participated in this research providing accounts on their repertoire of design activities. These accounts were analyzed using design theoretical standpoints and then composed as a case of study to be compared with game design.

This dissertation is not only of interest for those readers who want to expand their knowledge about game design and identify the similarities and divergences between the design of indie games and game design. This work appeals to all those who want to understand exactly how the design of games in general happens; a perspective that has not yet been provided in game studies.

ACKNOWLEDGEMENTS

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CHAPTER 1: INTRODUCTION

What is the design of indie games like? Around what does the design of indie games revolve? How does the design of indie games differ from game design? I will answer these questions with this dissertation. However, these interrogations did not origin this research, other questions did. Concerns that have existed within game studies and that had not been targeted. And even though the dissertation evolved and ended up focusing on the aforementioned questions, the very initial concerns that led this research still find an answer through the pages of this work.

Katherine Neil's (2012) claim on evaluating game design in practical contexts was one of ideas inspiring this dissertation. Especially, Neil's (2012) observations on the limited evidence showing that game design contributions support designers in their practice and on the lack of abstract tools designers have to undertake their work. The other idea that kick started this effort was a comment from a student at a game development course. He claimed that it was clear what the different elements of games were about, the definitions to the different game ingredients, the theory. But the question that lingered for him was: how to make a game?

Initially, the student's question was somewhat confusing. He had just made clear the theory had been comprehended. Why was it not clear to him how to make games? Then, it struck me. I have been making and reinventing games all my life and I have also been for many years immersed and influenced by the discourses of the game studies community. So, for me how to make games has always been logical, or something I have done intuitively. But this is not the case for other people. Some people come to game design courses stating they have grown up estranged from games and feel intimidated by the thought of having to make a game.

Within game studies, several people have elicited this lack of guidance on how to design games. On the one hand, Aki Järvinen[1] (Järvinen, 2008) pointed a decade ago that despite all the efforts and contributions in game design literature, designers have to turn to their intuition to find out how to composite game elements and come up with a game. As well, in a talk at the *Game Developers Conference*, Stone Librande[2] (2015) argued that discourses on the design of games revolve around the "game", the "game" and more "game"; about the elements constituting a game, instead on how designers can do design. Even though it has been a while since Järvinen's and Librande's claims surfaced, the panorama within game studies around the design of games has not changed. There have not been theoretical standpoints for an understanding on how design is undertaken so that this can be applied for the design of games.

This way, this dissertation kicked off. One the one hand, inspired on Neil's (2012) view, to try to find out what were the design methods that designers of games actually applied in their practice, while actually designing. And on the other hand, driven by the question posed by the

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[1] Järvinen's response was to propose the *GameGame* (2005), a card game with which players structure games by arranging game components. However, this effort does not provide the epistemological knowledge on how design is undertaken.

[2] It could seem Librande's (2015) argument is not that relevant in this case, since he is not an academic but a game industry person. However, it should be considered that many of the game design contributions conforming the body of knowledge for the design of games within game studies come from the game industry. This can be corroborated in Orita Almeida's and Correa da Silva's (2013) compilation and classification of game design contributions.

student on how to make games; with the intention of unveiling how people in practical design situations make their games.

The so-called indie games scene seemed to be a pertinent context to undertake this study on design methods and on how to make games. As Paolo Ruffino mentions (2013), the dynamics of the game industry have changed allowing people from outside to get in the spotlight with their games and with their practice. These newcomers are entrepreneurs, artists, hackers, modders, vintage game revivalists, interface explorers or activists (Wilson, 2005). Thus, the fact that these game practitioners have diverse backgrounds implied the possibility of studying the design of games among people who have not been immersed in the routines and logics of the game industry. This entailed finding out how people made their games on their own terms, how people made games that already questioned some conventionalities and principles of mainstream games for not featuring the same common elements, such as a goal (Rose, 2013), e.g. *Proteus* (Key, et al., 2013).

However, it was through the elaboration of this dissertation and through the undertaking of the interviews with indie designers that new and unexpected "doors" opened. First, the topics of design methods and how to design games pointed to the logical requirement of digging into theories of design as a discipline, so that it was clear what a design method is and what designing implies. This because in game studies, the term design method is used indistinctly to refer all the existing game design contributions (Perez D, 2018). And also because despite the vast literature and efforts conforming game design, the epistemological knowledge on how design happens and is undertaken as human activity is extremely limited within game studies (see chapter 3 and 4).

Second, the conducting, analyzing and discussion of the interview answers pointed to a new specific direction for the dissertation based on what was being discovered. The dissertation did not have to revolve around showing how to make games or around finding out if indie designers apply or not design methods or follow game design contributions. The dissertation represented the opportunity to reach a theoretical understanding on the design of indie games in regard the design represented by game design. And by trying to reach such an understanding, it became clearer through the analysis of data that the design of indie games needed to be understood as a phenomenon more akin to an artistic practice than to a commercial design practice.

Is the design of indie games different from the design of indie games? The dissertation mainly revolves around this question; but through its pages also provides answers to other crucial concerns pertaining not only to indie games but to the design of games in general: what is that the designer of games deals with? How is the design of a game as an activity configured? What defines a design problem? What are constraints and how do the designers of games work with constraints? What role do constraints have in the design of a game? What are the activities people undertake for designing games? How does designing a game happen?

Before formally presenting the research question and clarifying the context in which it operates, I would like to address some comments I have heard while presenting this project to other people. While explaining I study the design undertaken by indie designers with focus on the activities for designing the game, I have heard: "ok, but game design is not the same as game development". To this and similar comments I can only reply by saying that both game design and game development are constructs that originate in the game industry (see chapter 3). So, it should not be expected that people that make games outside of the industry have the same conception of these terms or of the processes and pipelines for making games.

Moreover, this dissertation deals with the designing of games from the theoretical perspective of design as a human activity, not as an industry routine.

I have also been told I only interviewed the most successful indie designers, instead of turning to those unknown designers who make games "from the trenches". Upon this I can mention, I did interview wonderful designers who have gained recognition with their games. However, this recognition cannot be equated to financial success, which is very relative and depends on many other factors than just design. Some of these indie designers still have their full-time nongame jobs to be able to design the games they like in their spare time. So, the designers I interviewed definitely make games "in the trenches" and represent some of the many realities that the indie game scene contains (see chapter 2).

This is an invitation to the reader to leave behind many concepts that are popular within game studies; because the upcoming pages will question or even counter-argue several of these ideas, such as what is game design (chapter 3), to consider indie games as similar to mainstream games or the practice of indie designers not as professional as industrial practices (chapter 2), and even to envision design as *reflection-in-action* (Schön, 1983). The dissertation touches upon notions and perspectives that have never been explored in game studies. Therefore, new visions around game design, the design of games and the indie game scene will appear.

RESEARCH QUESTION AND HYPOTHESIS

The research question with which this dissertation deals with is the following: **based on the design undertaken by the designers of the so-called indie games, does the design of indie games constitute a different paradigm compared to game design?**

The hypothesis is the following: the design of the so-called indie games and game design represent different paradigms of design. The former questions the most underlying assumptions upon which game design is based, such as designing under determinant constraints, designing with the player as main focus, and following formalized design structures and procedures. The design of indie games does not comply with such traditions and principles so characteristic in game design. The design of indie games revolves more about personal interests and freedom while designing. And even though the design of indie games departs so much from the foundations of game design, it fulfills all the characteristics to be formally considered design.

The word paradigm as used in the research question and the hypothesis refers to the connotation that Ian Hacking (Kuhn, 2012) uses to explain paradigms in science as posed by Thomas S. Kuhn in *The Structure of Scientific Revolutions: 50th Anniversary Edition* (2012). Hacking explains that the word paradigm commonly refers to an exemplar, a model to imitate. However, Kuhn's term paradigm refers to a series of analogical arguments in dispute; a concept Kuhn applies to explain how sciences evolve into more fitting conceptualizations of the world and leave behind less adequate constructs to explain contemporary phenomena.

From Kuhn's view (2012), in the hegemony of a specific tradition of science exist a series of methods, practices, laws and instruments. Scientific traditions deal with a set of puzzles and problems as the focuses of a scientific community. Suddenly, serious anomalies appear within a scientific tradition showing that the methods previously followed do not live up to answering or solving contemporary puzzles or problems. This leads to a crisis favoring the rise of a new tradition representing a different and stronger paradigm in science. Eventually, the new

paradigm will become the predominant scientific tradition dealing with forthcoming puzzles and problems. Kuhn exemplifies paradigm change by referring to heat, magnetism and electricity, and pointing out how each of these discoveries led to the other one by reaching its limits of application (Kuhn, 2012).

Ian Hacking (Kuhn, 2012) explains that paradigms are contemporary to each other; a paradigm of a science can exist alongside its succeeding paradigm. Even more, both paradigms can use the same terminology but yet refer to different concepts and meanings. Hence, only within the corresponding paradigm proper interpretations to phenomena can be posed. Moreover, each paradigm can be represented by a different scientific community or school of thought. Eventually, one paradigm propagates and wipes away its predecessor paradigm becoming the strongest predominant scientific tradition.

In the same line of thought of Hacking and Kuhn (Kuhn, 2012), this dissertations aims at finding out if the design of indie games revolves around different principles, ideals and methods compared to game design. If the design of indie games has different concerns and focuses than the ones game design has. For instance, within game design the player is paramount (Fullerton, 2008), is it the same within the design of indie games? Does the player have the same relevance? Are the problems, interrogations and puzzles that the design of indie games deals with different to those that game design deals with? The dissertation turns to theoretical standpoints of the disciplines of design, engineering, architecture and product design for the epistemological views game studies lacks in order to answer the research question.

METHODOLOGY

The dissertation treats game design and the design of indie games as cases and undertakes a *comparative case analysis* with them (Berg, 2001) (Bryman, 2012)(George, et al., 2004) (Ragin, 1987). Game design is formed as a *case* or unit of study by putting together an extensive body of principles and formulations for the design of games from game studies as part of a theoretical framework, which represents chapter 3.

The design of indie games is formed as a *case* or unit of study by conducting *key-informant interviews* (Tremblay, 2009) with designers of indie games and coding and analyzing the answers to the interviews following a *constructivist grounded theory* strategy (Glaser, et al., 1967) (Charmaz, 2000). The designers of indie games that participated in the research are winners of the festivals *Indiecade* and the *Independent Games Festival* of the *Game Developers Conference* for any category between the years 2006 to 2016. These indie designers are: **Daniel Benmergui, AP Thomson (Hexecutable), Alina Constantin (Tiny Red Camel), Jim McGinley (Big Pants), Auriea (Tales of Tales), Jason Roberts, Patrick Smith (Vectorpark), Terry Cavanagh, Logan Olson (Hard Light Labs), Brendon Chung (Blendo Games), Ditto, Andy Schatz (Pocketwatch Games), Erik Svedang, Ed Key (Twisted Tree Games), Nathalie Lawhead (Alienmelon), Nina Freeman (Star Maid Games), Lucas Pope, Justin Ma (Subset Games), Douglas Wilson (Die Gute Fabrik and Copenhagen Game Collective), Ezra White Hanson (XRA), Matt Meyer and Brent Calhoun (Super Chop Games), Tom Sennett, Richard Boeser (Sparpweed), Eddy Boxerman (Hemisphere Games), Anders Gustafsson (Cockroach Inc.), James Earl Cox III (Seemingly Pointless), Danny Day (QCF), David Kanaga, Felix Bohtasch (Broken Rules) and Alistair Aitchenson.**

The analysis of interview data is carried out having as guides several theoretical standpoints on design theory, including such notions as design problems, constraints (Lawson, 2005) (Dorst, 2015) (Dorst, 2004) (Dorst, et al., 2001), projects without determinant constraints (Hatchuel,

2002) , *problem-solving* (Simon, et al., 1972) (Simon, 1996) and *framing* (Dorst, 2015), *C-K theory* (Hatchuel, et al., 2003), design style (Lawson, 2005) (Chan, 2000) and design methods. All these notions on design theory or design research are comprised in chapter 3.

With the knowledge generated on the design of indie games (chapter 6), a *comparative case analysis* (Bryman, 2012) (Berg, 2001) (Ragin, 1987) (Esser, et al., 2017) between game design and the design of indie games is undertaken (chapter 7). This *comparative case analysis* is also driven around the same theoretical standpoints from design theory used for the analysis of interview transcripts, but with special focus on Bryan Lawson's (2005) theoretical standpoint on the similarities and discrepancies between design and art practices.

Further details on the research methods, methodological approaches and strategies of the research are found in chapter 5. Figure 1 presents an overview on the general methodological approach of the dissertation.
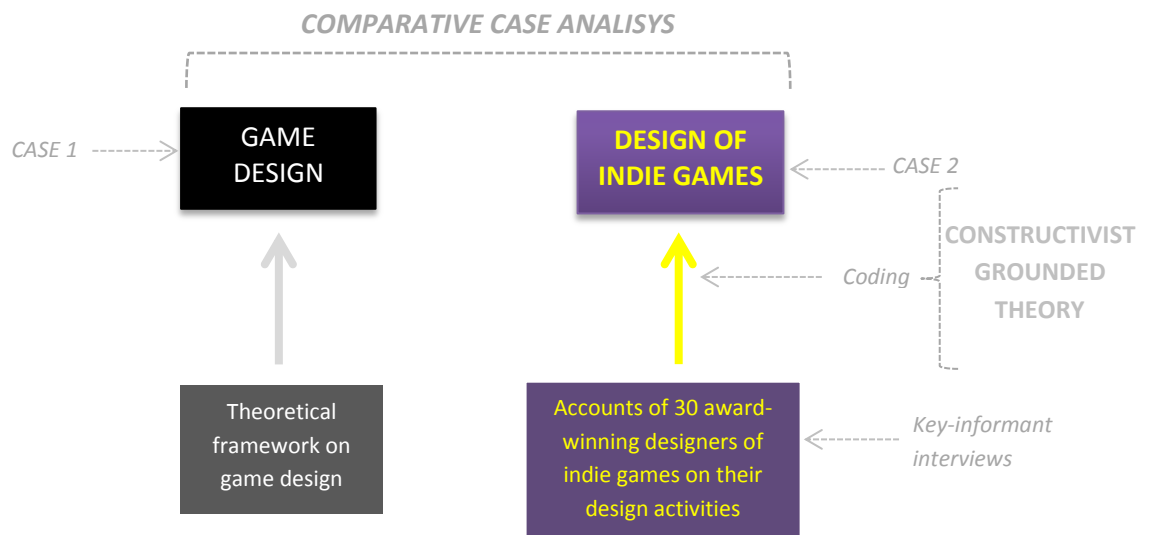
Figure 1. Overview of the methodological approach of the dissertation
At the right, the case 1, consisting of the unity of study on game design, which was shaped up as a theoretical framework. At the left, case 2, the design of indie games, consisting of theoretical standpoints generated following a *constructivist grounded theory* strategy through the analysis of the answers of *key-informant interviews* with designers of indie games.

PREVIOUS RESEARCH ON INDIE GAMES AND ON DESIGN AS HUMAN ACTIVITY

Within game studies, indie games have been in the spotlight and discussed since they got prominence in the mid and late 2000s, with the aim of reaching an understanding around these particular kind of games. One of the first relevant efforts was an issue of *Loading… The Journal of the Canadian Game Studies Association* titled *Indie Eh? Some kind of Game Studies* (Simon, 2013), which spawned several articles analyzing the phenomenon of indie games from different perspectives. Many other papers trying to define indie games have arose ever since (see chapter 2), including Maria Garda's and Pawel Grabarczyk's (Garda, et al., 2016) effort, which provides an overview of previous contributions as well as an explicative model for the different traits characterizing the games produced within the indie game scene.

An effort slightly related with this dissertation is the research undertaken by Orlando Guevara-Villalobos (2011) (2015). He explored cultures of production within indie games. He interviewed indie developers to find out characteristics of their practice from a sociological point of view, including some activities carried out for the production of the games. The output of this and other existing efforts on indie games can be found as part of the discussion around the indie games movement in the next chapter. Nevertheless, none of these works has focused on the design undertaken by participants of the indie game scene.

In regard with research on design within game studies, many works exist. However, despite the large body of theoretical work that game design represents, it does not provide the necessary theoretical standpoints to explain what designing entails, as it will be argued in chapter 3. In fact, just a handful of efforts have intended to turn to theories from design as field of inquiry for the study of the design of games. Annakaisa Kultima, Kati Alha and Timo Nummenmaa (2016) studied design constraints in the setting of the Global Game Jam but in a special event with experience game developers. Jussi, Kuittinen and Jussi Holopainen (2009) compared Bryan Lawson's (2005) model on design activities with several texts on game design. And more recently, the book *Game Design Research. An Introduction to Theory and Practice* (Lankoski, et al., 2017) has been edited. The text intends to approach game design from a perspective alike the school of thought of design research and presents design as *reflection-in-action* (Schön, 1983).

CONTRIBUTION OF THIS DISSERTATION

This dissertation will provide an understanding around the design of indie games. It will unveil the main characteristics of what designing games in the indie game scenes entails. This includes depicting characteristics of the design activities and processes undertaken by the designers of indie games for the creation of the games. It is also identifying the elements these designers work with to create the games, finding out how rigid or flexible their practice is, as well as recognizing the meddling or influence of the player in the design process, among other elements.

This research effort will also provide an understanding from a theoretical design perspective on what designing games entails. The design of games will be addressed by turning to theories from design as a field of inquiry and other disciplines such as engineering, architecture and product design. The design of indie games and game design will be studied regarding what is that designers deal with while designing, how are constraints determining the design activity, what are exactly the activities or actions designers do while designing, how do design methods support the design activity, and how do designers do approach the design, by *problem-solving* (Simon, 1996) and *framing* (Dorst, 2015). All of these being notions that have been unattended or not fully explored within game studies.

OUTLINE OF THE DISSERTATION

This dissertation consists of seven chapters. Chapter 2 deals with the indie games movement. It aims at reaching an understanding about indie games and what makes these games and their makers stand out among mainstream games. The chapter presents several discourses about indie games from the perspectives of game journalists, academics and game practitioners. It also digs into the roots of the term indie and the background of indie cultures and glimpses at the indie phenomenon from the perspective of several theoretical standpoints

from media studies. The text also discusses several traits of indie games in contrast to mainstream games and how from some perspectives these two types of games constitute an opposition.

In chapter 2 I also argue that indie games can represent a radical other to mainstream games, an opposite view to the prevailing standpoint within game studies (Jahn-Sudmann, 2008) (Parker, 2013) (Martin, et al., 2009). The chapter also discusses about the intricate relations that members of the indie game community have established with the commercial game industry. The chapter closes by presenting indie games as a phenomenon encompassing not only digital games, but also other playful forms, which can even be partly physical or performative, and that are made for the sake of expression and creativity.

Chapter 3 focuses on game design. This chapter covers the principles and theories within game studies revolving around the design of games. I start by presenting a consolidated definition of the term game design and an explanation of the game design process according to the most well-known literature. I also give an overview of the history of game design and its impact within game studies by shaping up different views. The chapter also introduces one by one the most prominent game design contributions and discusses their practical use. This to envision how accessible and implementable this knowledge is for people designing games, such as the designers who participated in this research.

Chapter 3 also presents an overview of the existing visions on the design of indie games from the perspective of game design, in order to find out if the literature prescribes something special or particular for the design of this kind of games. I close chapter number 3 by redefining game design and envisioning it as a construct originated and mostly revolving around the game industry, following the industry's conventionalities and logics. With this vision about game design, I prepare the "ground", the foundations, to compare this term against the results of this dissertation, the design undertaken by the designers of indie games.

Chapter 4 is totally focused on theories about design. The chapter constitutes the theoretical standpoints for the analysis of the design undertaken by the interviewees of this dissertation and for the comparison between the design of indie games and game design. These theories do not come from game studies but from other disciplines. These disciplines are engineering, architecture, product design and design as field of study, and more specifically the schools of thought of design research and design theory.

The chapter defines design and gives and overview of design as a field of inquiry. The text also introduces *problem-solving* (Simon, 1996) (Simon, et al., 1972) (Simon, 1973) and *reflection-in-action* (Schön, 1983). Paradigms that have influenced the views of some design research theorists and that have strongly defined the vision on design within game studies. However, in this chapter I argue that both paradigms are extremely similar and that *reflection-in-action* (Schön, 1983) is not an appropriate theoretical standpoint for the explaining of design.

Chapter 4 also introduces the characteristics of the context in which designers undertake their design practice: design problems, design solutions and constraints are defined. As well, the text presents and exemplifies the approaches for the undertaking of design: *problem-solving* (Simon, 1996) and *framing* (Dorst, 2015). I also introduce *C-K theory* (Hatchuel, et al., 2003), a framework to understand and analyze design as a series of transformations of concepts and knowledge, an innovative theoretical point for the study of the design of games. The text closes by setting some boundaries between design and art. This with the purpose of understanding in later chapters, if the design of indie games shares more in common with artistic practices than with commercial design practices.

Chapter 5 explains the methodology of the research, which has been already shortly introduced. Chapter 6 presents through visualizations and discusses the results of the research. It introduces all the participants of the research and their games. It presents and discusses about whether the design of indie games and game design revolve around design problems or design projects as well as several other defining elements that designing games from both perspectives imply. The text also presents and explains the design processes for the design of indie games and game design, the contexts in which the designs origin, as well as the design methods applied by indie designers in their practice and the outlooks that influence their design activities.

Chapter 7 answers the research question of the dissertation and proves correct the hypothesis. The chapter offers a thorough discussion on how the design of indie games and game design feature similarities and divergences. The chapter especially focuses on portraying the design of indie games as more alike to an artistic practice and game design as more alike to a design practice. The chapter presents a very robust visualization on this phenomenon. The text also traces future leads for the study of design within game studies and stresses on notions and theoretical standpoints that the dissertation contributes with.

TERM DISAMBIGUATION

It is important to clarify the connotations to the most common terms used in this dissertation. While writing this dissertation, it was found that game design consists of a construct within game studies revolving around a series of principles and conventionalities from the game industry with limited epistemological insights about what designing implies (see chapter 3). For this reason, the term **game design** refers only to this construct from game studies, while **design of games** refers to the activity of designing or devising games as a human activity in general. Thus**, design of indie games** or **indie design of games** refers to the **design of games** from an indie perspective or within an indie cultures context.

Because of the same reason, I refrained myself from using the term game designer to refer to people making games. I felt this term implied this person designs games following the logics of the game industry. Similarly, the term indie game designer sounded as someone who followed the principles from game studies revolving around the game industry but as an indie creator. Thus, I preferred to refer to people making games in general as **designers**, **designers of games** or **game practitioners.** And in case of those affiliated or empathizing with the indie games movement such as the participants of this research, as **indie designers of games** or **designers of indie games**. The term **game designer** is only used a few times in chapter 3, to make reference to the way in which the game design literature refers to the designers of games.

Other frequent words referring to the creation of a game are **producing** or **production**, and **development**. **Production** or **producing** refers to the work on the game towards its completion, once that the design has already been finished. It is all those additional activities that the creation of the game involves excluding the actual design of the game, such as managing the work and communicating with team members or polishing the game without changing its essence. **Development** or **developing** connotes the whole process of game creation, both the design and the additional work for its completion, its production. **Production** and **development** in this dissertation do not make reference to other popular constructs in game studies such as game production or game development.

One of the most common terms in this dissertation is the term **design**. **Design** can refer to a discipline (chapter 4); it can also refer to the activity or process of devising an object, including a game. **Design** also can refer to the result or product of the design activity, e.g. the designer finished a design. And the term **designing** refers to the activity of undertaking design.

CHAPTER 2: THE INDIE GAMES MOVEMENT

This chapter will discuss about the indie games movement. Some of the questions that will be addressed are as follows: What are the so-called indie games? What makes them different from games referred as mainstream games? What are the traits of the cultures existing around indie games? What are the dynamics between indie games and mainstream games and between indie game developers and industry people?

This chapter attempts to shed light around the indie games movement, its characteristics and nuances, from a different perspective than as previously done in game studies. The chapter builds upon existing academic views and pursues leads representing in some cases new directions in the study of the so-called indie games. The indie games movement will be discussed in relation to the games industry and how intricate relationships have been established between the two concepts that strongly challenge several core indie values. The indie games movement will also be discussed as a context where people can create games or playful forms that differ greatly from products considered "standards" within gaming cultures shaped by the industry; a scenario where games can be partly digital, physical, performative, or include many other forms of artistic expression. The goal of this text is to reach a better understanding around the phenomenon of indie games in order to ground the main topic of this dissertation.

The structure of this chapter is as follows. First, I will present a few examples of indie games and the discourses around the indie games movement with the purpose of explaining what this phenomenon is about. Second, I will explore the roots of the term indie and indie cultures and will turn to the theory of alternative media to get a better understanding of the social phenomena labeled as indie. Then, I will present different traits of indie games in contrast to mainstream games and will show how in some cases these two kinds of games represent an opposition. Next, I will present a series of discourses shaping the intricate relationship between the members of the indie games movement and the industry. And finally, I will discuss the indie games movement not as an opposition to the industry, but as a context for expression and creativity.

As I will explain hereafter, by referring to different theoretical approaches, indie movements and indie cultures have thrived through different circumstances and have got multiple shapes and forms through their history. Indie movements and indie cultures evolve and transform with time, they present multiple faces as they develop. Due to the wide array of visions and interpretations within the indie games movement, the present research offers a particular point of view that may differ from or present overlaps with other texts and analyses on the matter.

INDIE GAMES

Imagine a world with no women left, and suddenly, you find a baby girl. To protect her from the depraved men that coexist with you in the world, you raise her secretly in the basement of your van house. But one day she disappears. For this reason, you go on a quest trying to find her following trails of blood. On your journey you meet very peculiar persons, and even have to fight some of these people. This is *Lisa* (Dingaling Productions, 2014), a turn-based 2D RPG indie game taking the player through different emotional states. It portrays a very bizarre post-

apocalyptic world full of strange characters, situations and puns, such as a character farting you while you sleep or muscular men in drag. *Lisa* was developed by Austin Jorgensen. It was funded through a *Kickstarter* campaign (Kickstarter, 2017) and is currently sold digitally on *Steam*, the most popular digital distribution platform for games.

Picture yourself walking in a garden crowded with cats and picking each of them to give them a pleasant lick. This is *Cat Licker* (Cox, et al., 2012); a 2D game in which the player scores points per cat licked. In the game there is no enemies or obstacles; the player does not die nor is challenged or punished for any actions while playing. The game was made in four days by Joe and James Cox as part of the game jam event *Ludum Dare 25* (Cox, 2017). The game is part of James Cox's project about making one hundred games in five years. *Cat Licker* is available for free on the game platform *GameJolt*.

There are many *Tetris* (Pajitnov, 1984) clones and imitations in the market. Borrowing inspiration from such a popular game, the tower-building party puzzle 2D game *Tricky Towers* (WeirdBeard, 2016) asks players to juggle with tetromino bricks. The addition in this game is real-world physics and a multiplayer gameplay style as well as particular rules, objectives and attractive power ups. In one of the modes of this game, for instance, the purpose is to be the first player whose tower of blocs is tall enough to reach the finish line, something quite opposite to traditional *Tetris.* In *Tricky Towers* players also have magical powers that allow them, for example, casting lightning strikes to impede the growth of the competitor's tetromino tower or tossing pitched-roof houses or pianos upon the opponents' towers to disrupt the piling of the blocs. The game is available for sale on digital game stores for different operative systems and has also been released for *PlayStation 4* and *Xbox One*. The team behind *Tricky Towers* is *WeirdBeard*, a small-sized Amsterdam-based company that has been readapting the concept of playing with tetromino bricks through different platforms (WeirdBeard, 2017).

The abovementioned games are just a few examples of works produced within the indie games movement. Each of them implies a very particular scenario in terms of what the game consists of, as well as on characteristics of the team that developed such games and the context surrounding their production and distribution. Each game offers a distinct gameplay; each of the games features visual styles and narratives that do not repeat in the other examples provided. Among such diverse facts, what is what makes of these games indie games? Is it at all possible to find common traits amongst games that stem from such individual creative freedom?

Illustration 1 Example of indie games.
To the left *Lisa* (Dingaling Productions, 2014), in the center *Cat Licker* (Cox, et al., 2012) and to the right *Tricky Towers* (WeirdBeard, 2016).

THE MOVEMENT OF INDIE GAMING: DISCOURSES, TRAITS AND BACKGROUND

Discussions aiming at defining or explaining the indie game movement are numerous. In fact, these arguments have evolved through time and have been characterized for overlapping and clashing around specific notions or ideas, depending on the person behind each point of view. Journalist Dennis Kogel (2012) sees indie as a label revolving around four aspects: a business model, a game format, the games themselves and an ethos. Business model implies that the less the game developer resembles a corporation, the more indie it might be. Game format deals with the presentation of the game, implying that most indie games tend to be digital and cheap, in contrast with the nicely "boxed" and pricey mainstream games sold in retail stores. Indie games also tend to present a different aesthetic experience in comparison to popular mainstream games that are often shooters; indie games present other gameplay styles instead, for instance they are hardcore strategy games, interactive fiction or old-school role playing games. Ethos implies that indie developers make games for passion and freely, leaving outside of this definition all developers that are independent but financially driven, such as casual mobile game developers *Rovio* and *Zynga* (Kogel, 2012).

Indie game developer David Rosen (2009) offers in his blog a definition of indie based on how organizations such as the *Independent Games Festival* and *Xbox* deal with indie games. Especially regarding the latter, *Xbox*, Rosen pays attention to how the console has changed the way of presenting games that are independent and quality-proven by *Microsoft*, in contrast to other games that are developed independently but not endorsed by *Microsoft*. Rosen thus endows indie games as having two characteristics: First, they are driven by passion instead of money, and while money is important and necessary, for indie developers it is just part of the logistics but not the ambition behind the game. And second, they are developed in the "trenches", the people behind such games do all the hard work themselves, the programming, the art, the marketing, etc. (Rosen, 2009).

In an article debating claims about games made with love or about an ethereal "indie spirit" as well as other common assumptions and definitions of indie games, indie developer Craig Stern (2012) reaches the conclusion that indie games are such that are developed from beginning to end without the intromission of any publisher or licensor as well as are created by a single developer or a small team. Stern argues that indie developers are those that have full freedom to decide upon their game and maintain the intellectual property of their work. The size of their team also allows the flow of creativity, in contrast to those big companies where people have a limited input with their work in the final result of the game (Stern, 2012).

Besides these views revolving around independence and freedom to create, a group of game practitioners who have subscribed themselves to the indie game movement have also brought a sense of subversion to the discourse. *The Scratchware Manifesto* (Designer X; Designer J1; Designer R, 2000) is a text that includes the views of different designers of games on situations within the game industry that are not optimal. The manifesto deals with several topics, such as the rights designers have over their creations, their games, the exploitation that the industry performs over people and resources in seek of money and power, and even the rejection to negative industry traditions such as working extra hours. Greg Costykan, also known as Designer X, is one of the contributors to the manifesto. He advocates for a game making practice that favors creativity and innovation, breaking away from the controlling ways of the industry. He calls for a revolution of independent developers such as the movement originated by the first fathers of the videogames, such as Chris Crawford, Will Wright or Dani Buten.

Anna Anthropy is an independent designer of games and activist that has made games that question the status quo on sexuality and gender such as her most known game *Dys4ia* (Anthropy, 2006) , a game that portrays her journey with hormone therapy to transition from male to female. Besides her games, Anne Anthropy (2012) advocates for a game making practice open to minorities and unrepresented groups that allows ordinary people express themselves through the design of games, such as decades ago other creative people did through the production of their own self-made zines.

Another important figure of the indie game movement is Paolo Pedercini. With his initiative *Molle Industria* he has made many games presenting strong criticism about pivotal social topics like poverty, gun control, slavery, religion intolerance, among many other themes. As an active voice within the indie movement and in academia, Pedercini sees actors within the indie scene as cultural producers, publishers and makers with creativity and valuable skills with punk roots going through a soft-rebellion against capitalism (Pedercini, 2012). But because capitalism is unavoidable and the market is saturating with a high offer of games, Pedercini suggests indie game makers to conquer new spaces and situations that have not been yet explored by the industry such as games at work, games for seniors or making play out of new and untypical controllers and interfaces (Pedercini, 2017).

From the game studies perspective, some theorists have also offered their view on indie gaming. Jason Wilson sees indie gaming as a multidisciplinary field encompassing media art, activism and entrepreneurship. Wilson considers the makers of indie games as start-up people, politically engaged producers, hackers, modders, vintage game revivalists and as explorers of interface possibilities (Wilson, 2005). Realizing that the concept of indie gaming revolves around a series of conversations among different actors including producers, developers, designers, journalists, and players, Paolo Ruffino defines the indie games movement "as a series of discourses in video game culture that changes the understanding of the values attributed to the production of a video game" (Ruffino, 2013 p. 115).

The values to which Ruffino refers to are mostly those that deal with the distribution, development and financing of games (Ruffino, 2013). He implies that the industry underwent a transformation of structure and ways for working. The industry changed its dynamics but not towards democratization; it transformed into forms propitiating the outsourcing of services and the finding of already-made assets to profit from. The indie game movement arose finding in this context a place where to thrive.

The relation between the indie game movement and the industry is a complicated one. Many times one concept has been contrasted to the other, but clear-cut definitions are hard to provide. The main reason is that mainstream games do not represent a uniform or singular entity (Parker, 2013). This applies as well for indie games. There is no single indie game movement but a plethora of tendencies and discourses as they are described and lived by its participants (Lipkin, 2013). For this reason, the characteristics and views on what indie games are will differ from country to country and from one social circle to another (Lipkin, 2013). Designer and academic Paolo Pedercini (2012) envisions indie gaming not as a Boolean but more as a continuum; a gradient through which indie game developers project themselves and their games depending on the degree of freedom they enjoy or lack of from capitalistic structures (see illustration 2).

Illustration 2 Paolo Pedercini's visualization positioning indie game developers.
With this diagram, Pedercini projects indie game developers within a continuum in relation with mainstream developers based on their degree of independency from capitalistic structures (Pedercini, 2012).

One of the situations that can be observed within the indie game movement is that its actors and participants build strong connections among each other. They behave like part of a community where they support each other. This phenomenon is very visible in the social network Twitter. Independent designers and developers follow each other, retweet each other's tweets, and establish public conversations on this social platform. On Twitter "indies" post sketches and mockups, share their ideas for potential games and give previews on their prototypes and upcoming releases.

Guevara Villalobos (2011) identified this phenomenon within the indie games movement and called it *communities of practice*. Through a study consisting of interviews with game developers at independent companies, Guevara Villalobos depicts these communities of practice as social environments, both physical and virtual, where members share knowledge, expertise, resources and work practices. They also transfer skills and support each other with design and development tasks such as testing each other's games and providing feedback. In these communities people find moral support, build trust and find motivation for their indie endeavors. The common interests around game making keep these social contexts clipped together (Guevara-Villalobos, 2011).

Another explanation to this situation is provided by Pierson Browne (2015). Browne turns to the philosopher Benedict Anderson's (2006) to analyze the indie games movement. Anderson (2006) coined the term "imagined community" to analyze nationalism, explaining that nations are social constructs of individuals who share a set of ideals and interests, identify themselves as part of a certain group or nation, and have an image of a communion, even in cases in which these individuals do not know each other or have a limited interactions among them. Browne (2015) expands this concept and argues that indie developers and the indie game fans share common discourses and that these actors have a common understanding of what indie games are and the kind of position they have in regard to what the mainstream is.

The discourses and narratives so far presented place value on the terms, indie, independent and independence, to the point that the words indie and independent are interchangeably in many cases, i.e. indie game and independent games[3]. Maria Garda and Paweł Grabarczyk

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[3] The terms indie and independent pose different connotations. According to *Dictionary.com*, the word "independent" has its origin between 1610 and 1615 and refers to something or someone that is not controlled regarding opinion or conduct; to someone that is not subject to an authority or jurisdiction and is autonomous or

analyze popular discourses around the two terms in games cultures in order to understand what these two words connote (2016). These researchers explain that "independent" indicates a status of independency of the game in regard to an external factor of financial, creative or publishing kind. This entails that a game can be considered independent in either one or all of these three factors (Garda, et al., 2016). Game developers that invest their own money to produce a game would be financially independent. A designer coming up with the whole concept for a game and taking it further until its release would be creatively independent. And a studio releasing a game without the support of another entity would be publishing the game independently.

A few examples of Garda's and Grabarczyk's applied view would be as follows (Garda, et al., 2016): *Super Meat Boy* (Team Meat, 2010) would be independent financially, creatively and from a publisher, since the game was self-funded and self-published and totally and freely developed by its creators, Edmund McMillen and Tommy Refenes. *Braid* (Blow, 2008) would be financially and creatively independent but would not be independent from a publisher; the game was self-funded and totally freely designed by Jonathan Blow but was published by Microsoft. Self-published and self-financed Rovio's game *Angry Birds Rio* (Rovio Entertainment, 2011) would not be independent creatively as its creation is based on satisfying a specific casual gaming target market. While games of the *Assassin's Creed franchise* (Ubisoft, 2007 - 2017) would not be independent at all, for being projects developed by large studios and funded and published by *Ubisoft* targeting a specific market audience.

On the other hand, for Garda and Grabarczyk (2016) the term indie in current popular discourses makes reference to the denomination of a group of independent games and to the period in game development history in which these independent games have arisen and gained momentum: the mid-2000's. The researchers identify in these independent games and time period a series of variable "markers" that refer to intrinsic properties of the games or to characteristics of the games' surroundings or development. Some of these markers or indicators are the following: the 2D visual style of the games, the development of the games by small-sized teams, the small-file-game sizes in comparison to non-indie or mainstream games, the use of middleware and open-source tools for the development of the games, the development of games under a small budget, the low price of games at the market, the exploration of new themes and gameplay, the distribution of the games through digital platforms, the rise the local game scenes and communities, as well as a series of oftentimes opposing or contrasting ideologies around freedom, creativity and professionalism constituting a peculiar kind of indie mindset.

The markers Garda and Grabarczyk (2016) provide are not, however, subsuming all the possible features of indie games. Garda and Grabarczyk see these markers as highly influenced by economic, social and technological circumstances as well as functional just in certain contexts, prone to constant variation and subject to counterexamples or exceptions. This due to frequent changes in the environments in which indie games are immersed; for instance, from time to time a new distribution platform gets popular, a developing tool becomes more accessible to the use of more people, or a visual or narrative or design style becomes trendy (Garda, et al., 2016). When such events take place the understanding, dynamics and the especially the markers of indie games start to vary.

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free of thinking and action. It also refers to someone or something not influenced by others, to being not dependent or contingent on others, as well as rejecting or refusing obligations from others (Dictionary.com, 2017). Indie, on the other hand, is supposed to have arisen around 1940 and 1945 having as its original source the term "independent". The term refers to an independent or private business, work or professional practice but especially to those belonging to the creative industry, film, music or games. It is also a genre making reference to independence in its production (Dictionary.com, 2017) .

With the following model, Garda and Grabarczyk (2016) aim at conveying the dynamics and interrelations of the connotations of the two terms, independent and indie. The core of the model is constituted by the three types of potential independence the researchers posit: financial independence, creative independence and an independence from a publisher. As well, and represented with satellite orbits around the three types of independence, the researchers present a few of the markers for the term indie, implying that these concepts are variable due to changes in game development spheres.
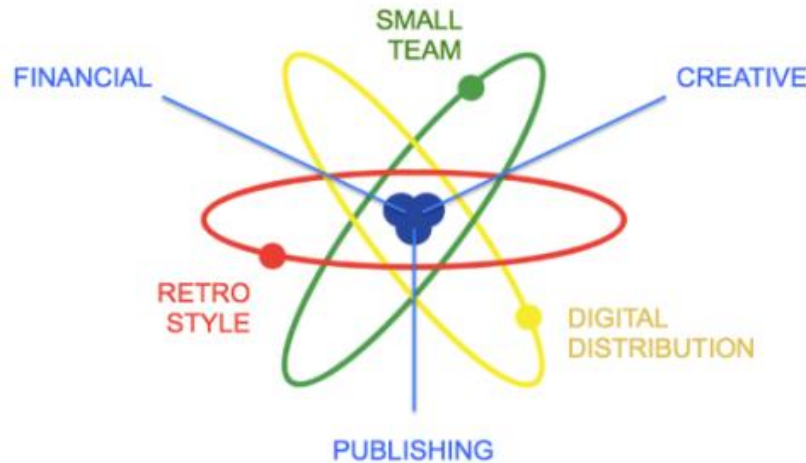
Illustration 2.3. Interrelations of the connotations of the terms indie and independent by Garda and Gabarczyk (2016).

A counter example or exception to the markers presented by Garda and Grabarczyk is *No Man's Sky* (2015). For the development of this indie game £1.25 million were pledged on the crowd-funding site *Kickstarter*, and had behind its creation a team of about 250 people. The game offers through its procedural generated content practically infinite explorative gameplay and is available for the price of about 60 euros on digital platforms as well as on *Microsoft's Xbox* and *Sony's PlayStation* (Diver, 2016). The case of *No Man's Sky's* is a very special one, to the point that it resembles more a mainstream game than an indie game. The circumstances around the development of this game as well as how it is marketed make of this game an example going beyond the borderlines of what indie games constitute from the perspective of the theorists previously presented.

The background or history of the indie games movement is a particular one and it depends on the lenses through which it is analyzed; this because the first videogames ever created happened outside of an existing industry. Once an established and prolific industry appeared the distinctions between independency and dependency from it became a relevant topic. It was early in game development history when the first efforts claiming for freedom to create and for the granting of rights upon a creator's work originated. In 1979 designers and programmers David Crane, Alan Miller, Larry Kaplan and Bob Whitehead left *Atari* because their professional needs for appropriate credits over their work and fairer economical retributions were not met. After their departure, these designers and programmers funded *Activision*, which is considered the first independent game company (Flemming, 2007).

In 1991 John Romero and John Cormack left their programming jobs at the software company *Softdisk* to create their own prolific game company *id Sotfware*. With their company, Romero and Cormack spawned such hits as *Doom* (id Software, 1993 - 2016) and *Quake* (id Software, 1996), and opened the door to the creative involvement of fans by making their game engine

available for use for free. (Lowood, 2014). But back in the 1990's the *Quake engine* was not the only engine available and at disposition of people interested in authoring or modding games. Many other means for game development coexisted such as *Klik ´n Play*, *Game Maker* or *XNA*. These engines and tools allowed game connoisseurs coming up with their own creations already before the turn of the millennium (Morley, 2014).

Indie games got in the spotlight halfway through the decade of the 2000's with the release of *Braid* (Blow, 2008). However, already in the early years of the decade of the 2000's, Eric Zimmerman was aware of such games and wrote about them (2002). Back then Zimmerman called for an inclusive understanding around the indie; an understanding that could involve their funding, marketing and distribution, as well as their specific properties and features, and also other aspects such as their spirit and culture (Zimmerman, 2002).

Years later, as indie games got prominence, game theorists started to touch upon all the topics suggested by Zimmerman when analyzing the indie game movement. But just as Garda and Grabarczyk (2016) and Lipkin (2013) note, there is not a single history or background of the indie games movement, nor a current single and uniform indie games movement. There are many games movements that can be talked about, per country, per game genre, per game trend, etc.

The next section presents a brief introduction to one of the approaches game theorists have undertaken to analyze indie games, by drawing parallelisms and comparisons between the relationships of indie media and mainstream media and indie games and mainstream games. This is followed by an overview of the background of indie cultures and using some examples to argue that drawing parallelisms from indie and mainstream media is not the best approach for the study of indie games, since each medium has a different background and works under different logics and circumstances. Thereafter, the theory on alternative media, a series of theoretical perspectives suitable for the understanding of indie cultures and by implication also of indie games, is introduced.

UNDERSTANDING THE INDIE CONCEPT

With the aim of understanding the concept of indie within game cultures, some theorists have compared and drawn parallelisms between the domains of indie and mainstream media and indie and mainstream games. These researchers mention recognizing an opposition between indie music and mainstream music and between indie cinema and mainstream cinema, but not between indie games and mainstream games (Jahn-Sudmann, 2008) (Martin, et al., 2009) (Lipkin, 2013). Trying to understand indie games through other indie media is a useful approach; however, this stance entails pitfalls. First, indie applies not only to media but also to other forms of cultural expression and production, and its interpretations have changed through time as it has got co-opted by and broken free from capitalistic structures that will be further explained (Oakes, 2009). And second, within media is possible to find actors within indie movements somehow going against the values indie stands for, such as freedom or independence. The examples presented hereafter are an elaboration of the arguments just postulated.

Indie is more than indie music, indie cinema and indie games. Indie includes more than just a phenomenon existing in reference to or in relation with an established commercial media. There are many other forms of indie. In fact, by checking related topics and tags to indie games in Wikipedia (Wikipedia contributors, 2017), it is possible to see how the indie movement spans through different forms of expression and cultural production. There has not only been

indie music, indie cinema, indie games or indie wrestling (branded as "indy wrestling") as apparent logical counter discourses. There have also been indie writing, indie video, indie press, indie software, indie art and indie design. Indie has had the forms of comics, fanzines, open source software, self-curated art exhibitions and freeware, among many other examples of cultural production.

In *Slanted and Enchanted: The evolution of Indie Culture* (2009) Kara Oakes presents passages of her experience around the indie; specifically what she lived growing up in Oakland and Berkeley immersed in the creative subcultures of independent artists, musicians, cartoonists, writers and thinkers. Oakes' scenarios span through different decades. These passages start in the 1950's and the 1960's with artists that laid the foundations for indie cultures through such actions as making art outside of the conventional, networking, valuing creativity over profit and working at grassroots levels. Examples of those years are poet Allen Ginsberg, dancing and chanting homoerotic and politically charged poetry at "happenings"; *The Diggers*, an anarchist and activist oriented "guerrilla" theater group, and the underground *comix*[4] *Zap 1* by Robert Crumb.

The 1980's passages by Oakes show a new version of indie propagating through a plethora of forms, such as zines like *Flipside, Slash*, *Cometbus, Absolutely Zippo* and *Maximumrocknroll (MRR),* comics, flyer art, skating and tape trading as well as the rise of the punk underground for the sake of self-expression, including the appearance of the punk music venue *Gilman* at 924 Gilman, in Berkeley, California. In the 1990's the "riot grrrl" movement arose revolving around several situations like the all-female headlined event *Love Rock Revolution Girl Style Now* at the *International Pop Underground Convention*, the female rock band *Bikini Kill,* the *Bikini Kill* zine and the feminist ideological compendium *Riot Grrrl Manifesto* by *Bikini Kill* 's leader Kathleen Hanna. But in the 1990's, the thriving indie cultures saw their schemes shaken to the roots and found themselves questioned in their identity when Nirvana reached mainstream success and other indie acts also opted for or were caught in a commercial crossover. From the latter days, the 2000's, Oakes passages show also a different side of indie, such as the itinerary *Renegade Craft Fair*, a do-it-yourself and ideologically "rebellious"-driven crafts market focusing on quality and uniqueness of works; a place for t-shirts, knitted bags, jewelry, recycled artifacts, velcro-skirts, etc.

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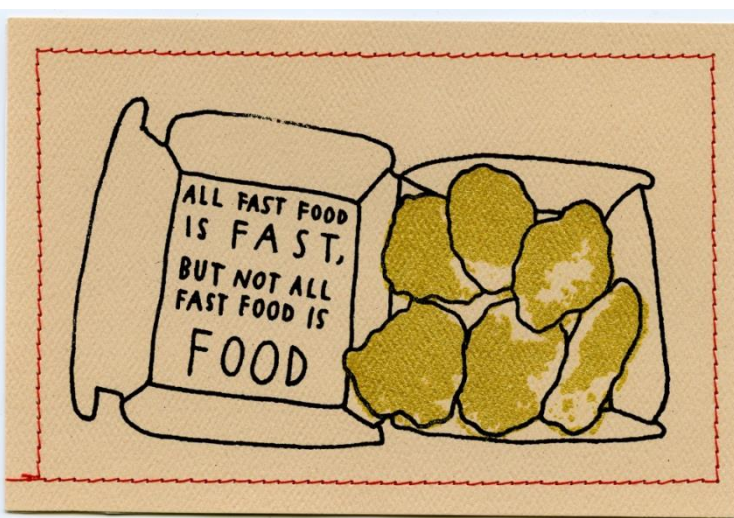
[4] The term "comix" refers to an "alternative" version of comics. These are comics made independently by people that went against established moral codes for making comics from the 1960's. These comics went against censorship of any kind and oftentimes depicted sex, drug-use and violence in their pages (Oakes, 2009).

The indie depicted by Oakes (2009) is a series of alternative forms of expression existing both outside and without the need of a reference to commercial and established power structures. In fact, some of Oakes' examples do not need a mainstream counterpart to exist, for instance poetry or self-published manifestos. Such indie forms represent contexts for experimenting and developing radical ways of seeing, thinking and being (Duncombe, 1997). The cultures these forms of expression represent are spaces for creation without a lead and out of the terms of the status quo (Duncombe, 1997). Nevertheless, some indie cultures have also been prey of commercial interests and been used as flagship to allure individuals whose tastes lie outside of the conventional.

According to Oakes (2009), punk and other indie subcultures were in the past oftentimes rebranded and repackaged aesthetically by corporations. But such a phenomenon was not as intense as in the last years of the decade of the 2000's, when defining indie became difficult due to multiple corporate ties around indie-related situations. iPods were indie because they featured indie artists in their TV commercials; the pricey clothing retailer *American Apparel* was indie for advocating fair wages for their workers and for presenting hipster looking girls in their advertisements; Toyota Scions cars were indie for being marketed for D.I.Y.-oriented people due to customization possibilities; and even music outfits formerly signed to indie labels with indie looks, indie sound and indie speeches, were signed to major labels and played stadium gigs (Oakes, 2009).

Similarly to these examples of the indie being reinterpreted by corporations, several media theorists have portrayed cases where the indie has had intricate relationships with the mainstream. Within music, Hesmondhalghm (1999) studies the case of the indie music labels *One Little Indian* and *Creation* and the strategies they followed to thrive. The former, with very strong punk roots, was partly sold in attempt to stay financially afloat and later on even established links with major companies like *PolyGram*, but kept its ethos of privileging artists and promoting anarchistic ideals with its releases. The case of *One Little Indian* represents the "professionalization" of "punk", in Hesmondhalghm's opinion. The latter label, *Creation*, was taken over by *Sony* and focused on markets labeled as indie rock, indie pop and Britpop. This move helped the label reach internationalization with acts like *Oasis* (Hesmondhalghm, 1999).

On the other hand and within film theory, Yannis Tzioumakis (2012) talks about a very popular kind of indie cinema from the USA lacking kinship with European films, something indie films used to always have. Instead, these indie films consist of an amalgamation of mainstream and indie elements. An example is *Pulp Fiction* (Tarantino, 1994), a multimillion-grossing indie film partly made in association with *Miramax,* an indie film production house, but starred by Hollywood stars (Tzioumakis, 2012). This is what Tzioumakis defines as "indiewood", term to refer to a later phase of cinema where the lines between indie and commercial films have become blurry.

The situations that Hesmondhalghm (1999) and Tzioumakis (2012) explore indicate that multiple shapes of indie exist within media, as well as various levels of co-option and dependency. Hesmondhalghm (1999) and Tzioumakis (2012) do not present examples of an opposition, but rather of a symbiosis. Indie in music and in cinema have got different forms

through time. For this reason drawing parallelisms between indie media and indie games is challenging, because there has not being a singular indie music or indie cinema, but many forms of them.

A suitable theoretical approach to understand the indie not as a counter media but as the broad concept encompassing self-expression, networking and cultural production as Oakes (2009) exemplifies, is the theory of *alternative media*. For Chris Atton (2002), alternative media are not a resistance to mainstream media, but rather new cultural forms pushing the limits of pluralism in political and artistic ways. Alternative media are not counter media and include forms and shapes that imply no opposition to established media traditions, for instance zines and hybrid forms of electronic media. These media give voice to counter and alternative publics and favor autodidacts working through collective experimentation. Moreover, alternative media do not intend to become a legitimate culture, instead, stay middle and lowbrow, in a space open for the expression of people (Atton, 2002).

Olga Guedes Bailey, Bart Cammaerts and Nico Carpentier (2007) envision alternative media on one side as a phenomenon existing in relation to the mainstream, as a hybrid form of independent media challenging established powers, authorities and structures. But Bailey, Cammaerts and Carpentier also find alternative media as a phenomenon not necessarily counter-hegemonic, but yet representing the means for giving voice and representation to communities and for connecting people and their concerns locally and globally (Guedes, et al., 2007). Bailey, Cammaerts and Carpentier (2007) profile alternative media under four different defining approaches:

- Serving the community: this approach refers to a community independently of its local or global scope and the possibility of such community to grant access and participation to its members to media content and to produce media. As well, it refers to the spaces propitiating public debates and self-representation of the community and its members. An example of these media is a radio program in a local radio station working as an open microphone granting community members the possibility to discuss on the radio and through the radio the problems of the community.

- Alternative media as an alternative to mainstream media: this definition identifies alternative media as the means for societal groups to produce non-conformist and counterhegemonic representations and discourses in relation to a mainstream media that naturalize a prevailing form of common sense. However, this approach also includes the contingency of alternative media; alternative media as something running in parallel to a mainstream media without representing a counter-form but still providing content that varies from the mainstream in ideological, representative and discursive way while allowing experimentation. An example of these media is alternative journalism in countries dealing with war and armed conflicts in the form of blogs reporting events mainstream media does not attend.

- Linking alternative media to civil society: this approach refers to seeing alternative media as an ordinary voice of civil society, as tools or means for democratization. Examples of these media are self-created, self-organized and self-run mailing list and forums of the civic society to talk about their issues and politics.

- Alternative media as rhizome: this approach envisions alternative media in reference to the metaphor of a rhizome: non-linear, anarchic and nomadic. It considerers alternative media as movements of the civil society presenting such traits as

connectivity, heterogeneity, multiplicity, rupture and mapping. This means that under specific circumstances like a catastrophe or an emergency, alternative media can connect with each other or even with governments and the markets in order to reach a common good. As well, it entails that alternative media appear and disappear; once they have become strong their presence can suddenly delude or after disappearing a new form of them arises. Examples of these media are civic-run radio frequencies or stations that appear after an earthquake to gather supplies and that tend to disappear as the needs for help decrease.

Christian Fuchs (2010) expands the concept of alternative media provided by Bailey, Cammaerts and Carpentier (2007) and coins the term *critical media*. Conversely to the previous theoretical views, Fuchs focuses only on that alternative media that challenges the dominancy of mass media in terms of media structures, content, distribution, production and reception. This challenging alternative media is what Fuchs sees as critical media, in the sense that these media afford criticality within the public sphere to which they address. These are media of the society potentially stimulating public debate (Fuchs, 2010).

For Fuchs (2010), the capital mass media are produced by the elite, hierarchically structured, ideological in form and content, distributed through marketing and public relations and aiming at causing a manipulative reception. In contrast, the critical media are produced by citizens, critical in form and content, rooted in community organizations, distributed through alternative channels and aiming at accomplishing a critical reception. Moreover, Fuchs identifies in critical media several qualities in their form and content (Fuchs, 2010):

- the content of these media revolves around a better-to-be society through the strengthening of co-operation and participation;

- these media appeals for new and better possibilities of social development to be imagined;

- these media is in itself contradictory; as it entails rupture, change, dynamics, the unexpected and non-identity; and,

- these media tries to raise the awareness on equality in society and takes the stance of the oppressed and exploited.

Alternative media	Examples
Alternative press, critical art	Mother Jones, Oz, Bay Guardian, The Nation, Le Monde Diplomatique, New Statesman, Fifth Estate, Class War; Duane Hanson, Joseph Beuys
Free radio, independent radio, community radio, pirate radio	Pacifica Radio Network (KPFA Berkeley, KPFK Los Angeles, KPFT Houston, WBAI New York, WPFW Washington DC, National Federation of Community Broadcasters, Grassroots Radio Coalition
Radical singing, protest singing	'Oh, freedom' (abolitionist), 'We Shall Overcome',
Alternative music concerts, protest song concerts	See alternative music, recorded protest songs
Alternative music, recorded protest songs	Mogwai, Godspeed You! Black Emperor, Billy Bragg, Robert Wyatt, 'The Preacher and the Slave' (Joe Hill, socialist), 'Bombtrack' (Rage against the Machine, social justice), 'Sound of Da Police' (KRS One, Anti-Racism), 'Kill the Poor' (Dead Kennedys)
Critical theatre	Youth International Theatre (guerilla theatre), Brecht's epic theatre
Independent cinema, underground film, avant-garde film, amateur videos	Crash (Paul Haggis, 2004), films by Jean-Luc Godard, Rainer Werner Fassbinder, Andy Warhol
Public access television	Manhattan Neighborhood Network
Alternative online media	Indymedia, Alternet

Illustration 2.5 Examples of alternative media as critical media presented by Fuchs (2010 p. 187).

As shown in this section, indie as a series of discourses varies from one cultural form to another and from actors to actors. One the one hand, and based on Oakes' (2009), Hesmondhalghm's (1999) and Tzioumakis' (2012) examples as well on the theory of alternative media, the roles of the indie in reference to the mainstream can be depicted in the forms of antagonism, parallelism, co-operation or even as a new paradigm soon-to-become or soon-to-supersede the current mainstream. On the other hand, indie can be cultures existing outside the mainstream and with no much reference to it. How can the indie game movement be interpreted from these two stances? What is like an indie game movement in reference to a mainstream industry? What is like an indie game movement with no reference to mainstream games? Hereafter I will explore both perspectives.

INDIE GAMES AS THE "RADICAL" OTHER

A few game theorists have talked about finding an opposition between indie music and mainstream music and between indie cinema and mainstream cinema, but not between indie games regarding mainstream games (Jahn-Sudmann, 2008) (Martin, et al., 2009) (Lipkin, 2013). Almost a decade ago Jahn-Sudmann (2008) compared indie games and indie cinema to find out if indie games represented an opposition to mainstream games as he considered indie films to be in regard to mainstream cinema, a "radical" other. Jahn-Sudmann concluded that

indie games offered innovation but did not represent an opposition or a "radical" other. This vision on indie games regarding mainstream games ended up echoing in the papers of many game theorists (Martin, et al., 2009) (Parker, 2013).

In his analysis, Jahn-Sudmann (2008) pays attention to three main variables as main characteristics of independent films: the position of the film or filmmaker regarding the industry, the kind of formal and aesthetic approach indie films feature, and the relationship of these films towards a wider social, cultural, political and ideological outlook. Regarding the first variable, Jahn-Sudmann argued that while indie films dispose of efficient distribution channels to run in parallel to the Hollywood industry, within games movements major enterprises like EA, Sony or Microsoft were very dominant in the market and relegated indie games to low-budget productions and with limited means of distributions, which at the same time impeded indie games' success.

Regarding their formal and aesthetic approach and their relation towards a broad social, cultural, political and ideological landscape, Jahn-Sudmann (2008) stated that indie games are visually different from mainstream games due to production scale, for their low budget costs. Yet, he does not find an aesthetic counter-discourse or resistance in indie games regarding the mainstream as indie films by the acclaimed film directors Harmony Korine, David Lynch or John Waters feature. Moreover, Jahn-Sudmann (2008) thinks that the aesthetics of mainstream games are not developed enough to be strongly challenge, reason why instead of offering a critique to mainstream games' aesthetics indie games opt to be aesthetically subversive but not an opposing phenomenon.

Since Jahn-Sudmann wrote his paper, many things have changed with indie cinema as well as with indie games that may question the instrumental elements of his analysis. In the last ten years new distribution channels like *Youtube* or *Netflix* have appeared and become popular, new funding platforms exist like *Kickstarter* and *Patreon,* and the production of films and games has changed due to digitalization and the development of technology. And within the indie games movement, events, circumstances and discourses challenging Jahn-Sudmann's understanding of indie games have also emerged, allowing envisioning some indie games as the "radical other" of mainstream games.

Indie games and the indie games movement have presented an evolution for the last two decades in which they have gained momentum. For this reason, the views about them and their interpretation by writers, critics and academics may be challenged or seem unfitting in present times due to recent events or facts questioning past theories or assumptions. Moreover, there is not a single or uniform version of an indie games movement or a single and uniform version of the game industry. Thus, to draw categorical and time-lasting judgments and contrasts between the two concepts is impossible.

However, taking in consideration the complexities that contrasting indie and mainstream games represent, I argue that indie games can represent an opposition to mainstream games to a certain extent from several perspectives. Indie games represent in some scenarios a "radical" other to mainstream games if taking a broad perspective; when considering game aesthetics (Niedenthal, 2009) not only as visuals but also as many other aspects constituting a game experience such as the gameplay, how much money the game costs or how the game is presented to the public.

First of all, the indie game movement can represent a "radical other" to mainstream games because indie games offer a variety in gameplay that mainstreams games do not. By paying a

visit to an electronics or a retail game store, we can find a limited number of gameplay styles: sports, adventure, fantasy and mostly shooters; in other words, the franchises of *Fifa* (EA Sports, 1993 - 2017), *Super Mario* (Nintendo, 1985 - 2017), *Grand Theft Auto* (Rockstar Games, 2001 - 2013) , *Call of Duty* (Activision, 2003 - present), among others. And it is also possible to spot a few indie games, such as the very popular *Minecraft* (Persson, 2011) or *Fez* (Fish, 2012), as well as more recent releases such as *Overcooked* (Ghost Town Games, 2016) or *Cuphead* (Entertainment, 2017).

Illustration 2.6. Examples of commercially-successful indie games.
On the right *Cuphead* (Entertainment, 2017), on the left *Overcooked* (Ghost Town Games, 2016)

But indie games, and especially those distributed digitally, are the ones offering a larger diversity in gameplay. A few examples of more diverse gameplay styles are multi-award winning indie games *Crypt of the NecroDancer* (Brace Yourself Games, 2015) and *DERU - The Art of Cooperation* (Ink Kit Studios, 2017). The former is a rogue-like dungeon exploration game where the movements of the characters are influenced by the beat of the music, affording the possibility of playing either with a normal controller or even dance pad. The latter game is a co-op puzzle with abstract but stylish and attractive visuals in which the players have to overcome challenges based on light contrasts.

Illustration 2.7. Examples of indie games with particular gameplay styles.
On the right, *Crypt of the NecroDancer* (Brace Yourself Games, 2015), on the left *DERU - The Art of Cooperation* (Ink Kit Studios, 2017).

Moreover, taking a deeper look, it is possible to see how some indie games have made similar or comparable impression among critics as those indie films by directors Harmony Korine, David Lynch, or John Waters, the directors mentioned by Jahn-Sudmann (2008). In an article from 2012, journalist Taylor Clark considers *Braid* (Blow, 2008) an authorship work similar to a film director's work because it aims at hinting Jonathan Blow's very personal view on human

condition and deals with the pursuit of something transcendental (Clark, 2012). Additionally, *Kotaku's* Deputy Manager Stephen Totilo points out that *Braid* (Blow, 2008) represents a commentary on game design because several elements such as coin-earning, death and time-reversing have a very peculiar meaning (Totilo, 2007). From Blow's perspective, and as quoted by Clark (2012), *Braid* equals in cinema to the making of *Citizen Kane* (Wells, 1941), while other mainstream games are so "of the same" equaling films like *Bad Boys 2* with Will Smith (Bay, 2003).

Within the indie games movement it is also possible to find games that represent an aesthetic counter-discourse or resistance to the mainstream besides *Braid* (Blow, 2008). With the puzzle-based *The Witness* (2016), Jonathan Blow explores non-verbal communication and invites players to foster their awareness, to being more mindful, something that opposes common mainstream games. With the upcoming puzzle-platformer *Miegakure* (2010) Marc Ten Bosch expands the possibilities of games by presenting a game in which the player interacts in 4 dimensions, instead of the 2 or 3 dimensions always afforded by the medium. And with the indie label *Blendo Games*, Brandon Chu aims at creating hand-crafted games, taking distance from mass-produced game forms.

Some indie games have also got the attention of the industry for the uniqueness of their design. Years ago at the *Games Developers Conference, Ubisoft's* creative director Clint Hocking referred to the indie game *Passage* (Roher, 2007) as follows: "Why can't we make a game that . . . means something?… a game that matters." (Bearman, 2013). A good answer to Hocking's question is indie designer Jenova Chen's comment about the use of technology in the industry and gameplay styles: "the blockbuster games use it for the same thing over and over again. What we tried to innovate was the emotional content" (Bearman, 2013).

Another kind of opposition identifiable within the indie games movement regarding the mainstream is lucre. Even though some indie game developers make a living through the profits of their games, it is very common to find indie games that are completely free (Ruffino, 2013). For instance, *GameJolt* showcases a handful of indie games that are for free, or that are accessible on a donation base without a fixed amount of money. Conversely, mainstream games focus on profitability and popularity over creativity and artistry (Lipkin, 2013).

Indie games oftentimes present a peculiar visual style, a style Jesper Juul has identified and found in such games as *VVVVVV* (Cavanagh, 2010), *Crayon Physics Deluxe* (Purho, 2009) or *And yet it moves* (Broken Rules, 2009). These works look retro, nostalgic or hand-made alike, but in some cases and depending on the game only feasible by the use of contemporary technology. Juul identifies a trend for emulating low-tech and cheap looks without being necessarily a sign of a low budget, but rather a deliberately design associated with a particular ethos of the movement (Juul, 2014). Mainstream games, on the other hand, do not present such a particular visual phenomenon.

Even though the previous examples show how indie games can represent a "radical" other to mainstream games, this does not mean all indie games are opposing forms to the games produced by the industry. Among indie games it is possible to find examples of games that mimic the looks and discourses of mainstream games. In contexts where people find means to develop their own game through the use of a game engines and the downloading of content from a game asset store, it is logical people might also want to make their own versions of the games they are fans of, which at the end can yield games that are very similar to mainstream games, but in customized versions.

The indie games movement has launched the career of some indie developers and put them in the spotlight, such as Jonathan Blow, Derek Yu, Nicklas Nygren, Marc Ten Bosch or Jason Roher, among others. These "indies" can be compared to what indie film directors as Harmony Korine, David Lynch, John Waters represent in cinema. Yet, there is within indie movements many more indie game developers and indie film makers that do not stand as an opposing force against the mainstream or that simply have not got big attention to be considered in any way in reference to the medium where they develop their work.

Moreover, when drawing further contrasts between indie games and indie films more conflicts arise. In one hand, the opposition "indie films-mainstream films" that Jahn-Sudmann (2008) pays attention to is based on Hollywood cinema. US cinema as a hegemonic international structure does not include local and regional markets. European cinema is seen as art cinema (Tzioumakis, 2012) and other regional trends of cinema have no representation within US cinema or simply do not compete with it, reason why these kinds of cinema are out Jahn-Sudmann's view (2008).

On the contrary, the indie games movement resembles more than indie cinema to McLuhan's concept of global village (1962), a series of distant economic structures interconnected through the use technology. The indie games movement is more inclusive than cinema in the sense that a small team of developers in Indonesia, an indie designer in South Africa and a hobbyist developer in Alaska can all find their way to reach international markets with their games and compete within the worldwide game market. Within this competition, their games will be judged and positioned in relation to the rest of the indie games and in reference to industry games.

The indie cinema that Jahn-Sudmann (2008) analyzes leaves many local productions out of its view. Thus, the cinema made in small countries or by students will be totally ignored and not judged as an opposition or similar to the mainstream cinema. While in the indie games movement games made in small countries or by students have won important festivals and obtained worldwide recognition. In other words, the accessibility and ease to produce and distribute makes a huge difference when comparing indie games and indie films. Since indie games can have relatively more representation or presence when compared to an industry than indie films have with the mainstream cinema portrayed by Jahn-Sudmann (2008), it is possible to generalize and say indie games do not represent a "radical other" to the mainstream, while the fact is that in some cases and to certain extent they do represent an opposition.

INTRICATE DISCOURSES AND TENSIONS BETWEEN THE INDIE GAMES MOVEMENT AND THE INDUSTRY

While advocating for activism through game making, indie designers Anna Anthropy (2012) and Paolo Pedercini (2012) find the current "availability" of game tools as a big achievement and a big opportunity for people to reclaim their right to express and be creative. But even if many game engines are "free" for use and many contexts for independently making games have appeared such as self-organized meet-up's and workshops, there is a co-opted side to these situations reformulating the terms of independence and freedom upon which the indie games movement revolves around.

When Nicholas Francis, Joachim Ante and David Helgason started developing the game engine *Unity* years ago in Denmark, their intention was to provide a tool that could be affordable for non-industry developers (Haas, 2014). Nowadays, *Unity* is for "free" for non-commercial purposes; game developers using the tool for commercial purposes have to pay an amount of money based on the deployment they produce and size of their team. As well, *Unity* has evangelists promoting the use of the engine within independent local scenes and communities (Vogel, 2017). At *Gamescom 2017*, the *Indiebooth* had *Unity* as main sponsor. And at the business pavilion, where companies sell their services to other companies, *Unity* had at its booth groups of indie developers showcasing their games. At the end, indie game developers support the growth of *Unity* not only as an engine but as a company through their own games. Indie developers foster the sales of the engines.

This strategy by game engine companies has even influenced a change in paradigm in game development. Years ago, in-house developed engines where used at game companies (Morley, 2014) (Pedersen, 2003). Nowadays, *Unity* is not only very popular among indie developers, but has also become a mainstream tool. As well, game design and game development books have also been influenced by this change in paradigm; to the point that some of the texts explicitly focus on how to use *Unity* or at least present the engine to students as a feasible way to start making games (Gubson, 2015).

The discourses about a "free" and "accessible" game making can be seen as a propagandistic effort supported by game engine companies. Members of the indie game community find this rhetoric appealing and empowering and start seeing it as part of their own ethos, even if this represents a paradox within what the term indie actually stands for. In fact, the possibilities and tools for making games and becoming an independent game developer existed before the discourse on free game tools appeared. As presented in a previous section of this chapter, there were already engines available for the public during the period of consolidation of the game industry, even if they were not easy-to-use or accessible to people without programming skills (Lowood, 2014) (Morley, 2014).

The tools for game making are embedded within the capitalistic logic of the gaming industry (Kerr, 2010) as well as the means and platforms to make games accessible to a large public. Indie developers have to comply with the terms, conditions and quotas that these platforms estipulate. As developer Tom Grochowiak (2016) expresses on one of his blog posts: "we're no longer independent developers, we're Steam developers" (Consalvo, et al., 2017 p. 7).

Nevertheless, members of the indie game communities are not complete victims in this situation. Indie developers also find benefits in this symbiosis. They get to exhibit their games to new audiences and at big venues by being sponsored by a corporation, something that otherwise would not be possible to them. As *Kill-Screen's* chief Jamin Warren (2014) narrates in his article about his experience at *E3 (Electronic Entertainment Expo)*, "indies" at the event had "no less than three different counter-E3 events". Warren uses the quotes to imply in a sarcastic way that indie developers did not represent any kind of counter discourse to the mainstream at the fair at all, reason why he asks for giving indie a different name.

The intromission of capitalistic forces within the indie games movement is not something recent; in fact, this has happened in video game history several times. For example, the *Games Developers' Conference* (*GDC)* in its origins was organized by Chris Crawford in the form of an informal living-room meeting with other designers as a safe context outside of the industry (Rouse III, 2001). Nowadays *GDC* is far from what it was in its origins; in its 30th edition in 2016, *GDC* had the participation of 26,000 industry members (UBM, 2017). *GDC* is currently an event

organized by UBG Network, a big conglomerate of services and solutions for technology, marketing and security. UBG Network not only owns the *GDC* brand, but also the internet portal *Gamasutra* (UBM, 2017), the main platform of information and knowledge-sharing for industry and indie developers.

The *Independent Games Festival* taking place at *GDC* is by consequence also part of a commercial apparatus. The *IGF*, as the festival is also known, is one of the main stages for indie gaming in the world. It was established to encourage innovation in game development and recognize independent developers, similar to what the *Sundance Film Festival* represents in cinema but for game developers (UBM, 2017). But even if the event is dedicated to indie games and indie developers, and includes opinions, views and reviews from a wide variety of people, and welcomes the votes from gamers to give away some of the awards, *IGF* is embedded within a big commercial fair and is thrown by a large corporation.

The indie game movement represents a field of opportunities for large companies, similar as outstanding works of indie cinema has directed Hollywood's attention towards a new territory to exploit (Tzioumakis, 2012). Therefore, it is not a surprise to find large game companies such as *Ubisoft* owning their own tiny studios and creative subsidiaries, as well as to find indie games developed by small teams with the investment from outsiders. These situations, despite the apparent paradox they represent within the ethos of indie movements, are common incidents in indie cultures. Oakes (2009) sees this phenomenon as regular when indie and crafting get bigger; once an opportunity to profit is evident, other commercial parties will come around trying to participate from the financial benefits. Yet, Oakes argues indie forms and indie cultures will continue finding new alternative ways of expression away from the mainstream (Oakes, 2009).

In a previous section of this text, the term "indiewood" coined by Yannis Tzioumakis (Tzioumakis, 2012) was introduced referring to films that are partly indie and partly mainstream. Based on the intricate relationships indie games have with the industry, it is a matter of time to see new adaptations of this term for indie games: "Meanstr-indie" for mainstream productions with indie looks or targeting indie fans, and "indie-ustry games" for those games of indie ethos, even made by independent studios, that due to the growth that their developers have achieved can compete equally with mainstream games at least in certain ways. Ultimately, it is the intention of many indie game developers to achieve commercial success with their productions (Guevara-Villalobos, 2015), which implies the growth and expansion of some indie studios can eventually transform "indies" into studios fitting more the forms and characteristics of mainstream developers.

In a study on the US music industry revolving around actions and strategies of large record labels influencing the creative practices of musicians, Keith Negus (1998) reflects upon the way entertainment corporations produce a culture by setting up structures of organization and working practices that define products and properties. Elaborating upon this view and applying it to games, Chase Bowen Martin and Mark Deuze (2009) argue that the game industry sets parameters within which the discourses revolving around game production and meaning-making evolve. Martin and Deuze claim that actors within the industry also contribute to defining concepts and ideas inherent to game cultures such as what is indie, what is corporate or what is mainstream. This perspective Martin and Deuze present allows understanding and seeing the indie game movement as immersed in the logics imposed by the industry.

As consequence of this imposed logic, the games from the indie games movement oftentimes are prone to be judged from a mainstream games' perspective. For instance, Ed Key's multi-awarded game *Proteus* (Key, et al., 2013), which is mostly about exploring without goals, penalties or enemies, became the center of a debate because people started discussing if it is was or not a game (Rose, 2013). A similar case happened recently to Nathalie Lawhead, creator of the award winning game *Everything is going to be OK* (Lawhead, 2017). She presented her game at *Day of the Devs*, and visitors, specifically gamers, made rude comments and looked down at her work. Lawhead mentions that especially streamers and Youtubers made negative comments: "What the fuck is this, what the hell, weird ass game, lol acid, haha who the hell would make this…" (Lawhead, 2017).

Illustration 2.8. Indie games that stand out for being different to mainstream game standards.
On the left *Proteus* (Key, et al., 2013) and on the right *Everything is going to be OK* (Lawhead, 2017).

The logic of the industry has also influenced the way the indie games movement is also judged for quality in its design practices[5]. Specifically, playing videogames is considered as an important factor to reach an understanding about game making and as a way towards professionalization (McCrea, 2013) (Ito, 2007) (Vogel, 2017).To play mainstream games can teach about game design; reason why many game design books suggest it as didactic strategy (Fullerton, 2008) (Rogers, 2010) (Salen, et al., 2004). As well, studies have shown that game design students can learn game making by playing (Salen, 2007). And certainly, gamers can get a good overview of game elements and acquire experience to replicate their favorite games by having considerable interaction with games (McCrea, 2013) (Ito, 2007). However, to envision game making in function of being in contact and interacting with industry games reduces the ability of people to make and deliver high quality games to the meeting and fulfilling of industry-based standards and conventionalities.

To play is a cultural universal, an activity or pattern common to all human cultures (Brown, 1991). People play throughout their life and especially in their childhood (Sutton-Smith, 1998), and this playing also forms people as game makers in the same logic as game studies texts rely on learning through playing video games. Donald Schön argues with his theory of *the reflective*

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[5] The knowledge about game making should not be understood either in regard to the existence of the industry. Games have been around for millennia. Discoveries in Egypt and Iran of the games *Senet* and the *Royal Game of Ur* indicate people were into games and their making already 3.000 and 2,400 B.C. (Flanagan, 2006). With the rise of the industry games remained intact in their essence, they were only facilitated through different means by becoming digital. In other words, the elements constituting games are the same as before they had a digital form. There is not a divide in game history between analog and physical in terms of games constituents such as goal, rules, procedures, etc. For this reason, game design texts invite students to practice and design board games (Fullerton, 2008) (Salen, et al., 2004) (Brathwaite, et al., 2009).

practitioner that a practitioner accumulates knowledge through experience that later can be applied to perform different tasks (Schön, 1983). Based on this theoretical stance, it can be inferred that people can use their background playing and gaming outside formal industrial and commercial logics and structures to also make high quality games. In other words, quality is not a synonym for professionalization. And professionalism implies meeting the industry's standards and following its conventionalities.

Furthermore, the contact or immersion in the industry does not guarantee people the knowledge and skills to make games. Guevara Villalobos (2015) points out in his study about indie game communities that some indie developers quit their previous job in the industry to pursue creative freedom. The structure of a large company only affords employees to do a few small specialized things, which means these people do not become experts in all what the design and development of a game implies. The outcome or impact of the work of this people is likely more limited production-wise than if they were in an indie context (Guevara-Villalobos, 2015) (Martin, et al., 2009).

Legitimation is defined as the "process by which cultural accounts from a larger social framework, in which a social entity is nested, are construed to explain and support the existence of that social entity, whether that entity be a group, a structure of inequality, a position of authority, or a social practice" (Berger, et al., 1998 p. 380). The indie games movement not only is an occasional "radical other" to mainstream games, or an oftentimes opposition, but also an entity that helps reinforcing and legitimizing the powers of the industry. Even in cases when indie game actors plead to break apart from the hierarchical powers of the capitalistic mainstream companies, the indie games movement is oftentimes much embedded into the systems and logics from which it tries to go against.

INDIE GAMES BEYOND OR OUTSIDE AN OPPOSING INDUSTRY

The series of discourses so far presented and discussed focus on a rhetoric of co-dependence between the mainstream and the indie alternatives, as if the indie only existed in relation to the mainstream. This view, however, even if fitting the scenarios discussed beforehand, does not consider the impulse of people to express themselves creatively through different cultural forms, which is another characteristic of indie cultures as the examples presented by Oakes (2009). In Oakes' accounts, people do such things as writing and reciting poetry, crafting accessories and designing artistic post cards; those creations do not have a direct counterpart in the mainstream and exist for the sake of expressiveness and creativity.

Oakes (2009) sees the creators engaged within indie cultures as people that have embraced the values of networking and cooperation; as individuals cultivating credibility, freedom, self-reliance and open-mindedness, controlling their own work and how this work is promoted. This situation is oftentimes referred as the D.I.Y. movement[6] (Do It Yourself); where creative practitioners run independently community-based alternatives to popular hierarchical power structures, without having wholly commercial purposes and out of an aesthetic necessity (Lowndes, 2016).

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[6] For Oakes (2009) indie is not D.I.Y. For Oakes D.I.Y. is just one of the many central topics within indie cultures. For Oakes indie is about serving the community and self-actualization through creativity and empowerment, all of which are an outcome of D.I.Y. On the other hand, for Ducombe (1997) D.I.Y: is something different than indie; because D.I.Y. imposes structures for creation, while indie is in essence always free and without leads.

The theory of alternative media (Atton, 2002) (Guedes, et al., 2007) presented early in this chapter, allows envisioning that people can foster their personal interest to make games in their own terms and with their own forms, according to their own interpretation and views. People feeling expressive can come up with any kind of creation they may call a game, even if such a game does not comply with the logics of the industry.

Within this broader stance, the understanding of the indie game movement is broadened in scope to more than just digital games, as most discourses trying to explain indie gaming revolve around. The indie game movement from a D.I.Y. and alternative media perspectives can encompass also game creators making games just for the sake of being creative, even if their work is not digital or conventional. Like people who make games improvising rules at parties and social events and wood crafters making wooded toys and wooded games and selling such creations in fairs and town markets.

The indie games movement can also include street games or other kinds of playful forms by game collectives and artists, such as William Zack Wood, whose games consist in some cases of following routines, impersonating animals, playing with props or doing improvisations on public spaces (Wood, 2017). The indie game movement can include as well developers that make digital games that are too idiosyncratic or that simply do not match the patterns and expectations of traditional gaming cultures. Games or playful forms existing in a limbo outside the understanding of the mainstream, even afar from what is produced by "regular" indie designers (Ryerson, 2016). For instance the "countergames", which are artistic digital game forms exploring new ways of interacting (Galloway, 2006).

Illustration 2.9. Non digital indie games and "countergames".
On the left, *Keep Smiling* (Siebenstein-Spiele) a wooden game sold at fair markets and on the internet and crafted by *Siebenstein-Spiele* (2004-2018) where the player has to align faces in a similar fashion to a *Rubik cube* (Rubik, 1974). In the middle, a picture of *Body Play Jam*, a physical game jam event at which artist William Zack Wood presented one of his games (Wood, 2017). On the right, a screenshot of *Adam Killer* (1999-2001) by Brody Condon, a Doom-mod art work in which the player encounters infinite replications of one character that either project infinitely through space.

From this stance it is also possible to frame a more logical existence of such popular venues for indie games as *Indiecade* and *AMAZE,* festivals featuring a great openness towards atypical game forms that would not normally fit in other mainstream scenarios or that in some cases are not digital. Examples of these other kinds of games are, just to mention a couple, *The Incredible Playable Show* (2016) by Alistair Aitcheson and *Ordnungswissenschaft* (2011) by Till Wittwer, Marek Plichta and Jakob Penca. The former is an interactive video game comedy show where players have to compete by performing different funny tasks and stunts. The latter is a physical game in which players move and stack boxes following a set of rules instructing sequentially what to do in the game.

Illustration 2.10. Performative and physical indie games.
On the left, a picture of *The Incredible Playable Show* (Aitcheson, 2016); on the right
Ordnungswissenschaft (Wittwer, et al., 2011).

CONCLUSION

This chapter discussed the indie games movement and presented several characteristics of such phenomenon. It was shown through examples that indie games arise among distinct circumstances; being some of these games made by a person, while other by a larger team of people. As for their plot, narrative, visuals and gameplay style, indie games vary considerably, which makes hard to associate or point a specific game genre or type of game as predominant within the indie games movement. However, game theorists and game-interested people have acknowledged the fact that most times indie games are made with constrained budgets, which has as impact on the features of these games. For instance, indie games tend to be 2D instead of 3D because 2D is cheaper and simpler to produce and 3D is expensive and laborious. Indie games are shorter in terms of playtime than mainstream games. As well as indie games present very personal or idiosyncratic themes that can be related to their author.

The indie as social phenomena does not only exist in reference or in relation to an established power structure, but also as a series of contexts where people engage in the crafting of different cultural forms for the sake of expressiveness, cooperation and creativity. In the last decades, indie cultures have produced magazines, poetry, music, theatre plays, comics, crafts, films, and many other products of cultural expression. Nevertheless, independently of all its forms, indie has got co-opted and reinterpreted by corporations continuously, although it has also found its way out from capitalistic ties.

Within games, the indie movement has been presented as a body of multiple discourses built, shared and communicated by the participants experiencing such a phenomenon. Game journalists, designers, players, publishers and members of the game industry construct a series of identities whose traits are spread and commented upon through different communication platforms, such as blogs, articles and social media posts. These identities and discourses revolve around different values, such as freedom to create, independence from external interference, as well as self-expression.

Among the aforementioned discourses, the words indie and "independent" are used interchangeably; however, each word has a different connotation within game cultures. Independent refers to designers and developers who create their games without intromissions from external entities. This implies freedom to develop the concept to work on, not depending

financially on an external party or releasing and publishing the game without the interference of another company. On the other hand, indie refers to a phenomenon of the last years, where independent games and independent game development and their related discourses gained momentum.

Examples of how actors and situations within indie music and indie cinema question indie values have been presented to argue that drawing parallelism and analogies from other media for the analysis of the indie games movement poses big challenges. Yet, I have argued that the indie games movement can be explored by looking at it as both existing in relation to and or in reference to the game industry as well as existing outside or beyond it.

In relation to the industry, the indie games movement can to certain extent constitute a radical other or an opposition to the mainstream; if analyzed not only by its visuals, but also for its gameplay styles, its costs and for what these games represent as a broad aesthetic experience. Even then, the indie games movement has an intricate relationship with the industry. Many discourses within indie game communities are strongly influenced by or even established by the industry, such as the ideals around free tools or the logics to understand games and judge (indie) games.

Nevertheless, the indie games movement can also be interpreted as a context in which game makers can express themselves and come up with any game form they want, even if such games do not fit the logics established by popular game cultures. Moreover, these façade of indie games can also encompass games that are not digital; it can be broadened to physical games or games that lie between the digital and the physical or games that borrow elements from other cultural forms of expression, such as theatre and performance.

Even though indie games and the indie games movement have been the subject of the study of several academics over the last years, there is still leads to expand the study around this social phenomenon within game cultures. As the indie games movement gets reinterpreted by corporations and keeps breaking free from them, new situations worth analyzing appear. The vision this text has presented around indie games and the indie games movement is just one of the many that can exist around this phenomenon.

CHAPTER 3: HISTORICAL AND THEORETICAL PERSPECTIVES ON GAME DESIGN

This chapter focuses on game design. On the following pages, I will explore the principles and theories within game studies for the design of games in order to establish the definition and foundations of game design[7]. I will also address the issue of the practical application of game design as depicted by game studies. Since this dissertation studies how the design of games is undertaken by a specific group of designers, it is important to grasp how the models and theories from game studies can be applied by the designers of games. Last but not least, I will discuss how literature addresses the design of games when undertaken outside of the mainstream industry, the so-called independent design of games.

Game design has been surveyed numerous times in game studies[8]. Within the literature several frequently-cited efforts compile the most prominent game design contributions (Kreimeier, 2003) (Dormans, 2012) (Neil, 2012) (Orita Almeida, et al., 2013) (Kultima, 2015) (Dormans, et al., 2017). To avoid repeating the work done by the above efforts and still provide a substantial perspective on what game studies prescribes for the design of games, this chapter will be developed from a very particular stance. This is, the exploration of game design and its exposition in reference to the concepts and aspects that relate to the theories of design research around which the analysis part of this dissertation revolves. This approach offers a distinct view about game design, making it easy to comprehend how the analysis and comparisons between the game studies' game design and the design performed by the so-called indie designers is undertaken, and hence, answering the dissertation's main research question.

The structure of this chapter is the following: first, I will present a definition of game design, the principles upon which game design is based and its scope within the process of game creation. The history of game design, the historical antecedents and current trends for the study of the design of games in game studies will follow. The third section is an introduction to the most prominent contributions in game studies for the design of games. Finally, the chapter focuses on the ways game studies literature addresses the independent design of games.

The chapter closes by presenting a series of notes about the nature of game design. These remarks position game design as a construct originated and mostly revolving around the game industry; as a phenomenon determined by industry conventionalities and logics. As well, these remarks pinpoint that, beyond following business and industry procedures or routines, game design as a focus of game studies, offers limited epistemological foundations on what designing a game entails. With this concluding remarks and the knowledge gained through the writing of this chapter, the contribution of this dissertation and its results within game studies is formulated.

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[7] As stated at the beginning of this dissertation, the term game design is used to refer to the focus or construct within game studies that describes and prescribes the design of games. To refer to the practice of designing a game, the term design of a game is used instead.

[8] Game studies is a field dedicated to the study of all forms of games and play. It started as an effort to study computer games and the fundamental unique aspects that differentiated them from other kinds of media in the late 1990's and early 2000's (Deterding, 2016). Game studies is a multidisciplinary field; it gathers researchers that use methods and theories from other academic fields to expand the understanding around games (Egentfelt-Nielsen, et al., 2009).

GAME DESIGN: DEFINITIONS AND FOUNDATIONS

Texts dealing with and defining game design are numerous[9]. Conciliating diverse points of view from academics and industry veterans on the subject, this research presents the following consolidated definitions:

- Game design is the process undertaken by a *game designer*[10] for the creation of an experience for a player collated and shaped by rules, goals, structures, themes and ideas (Rogers, 2010)(Salen, et al., 2004) (Brathwaite, et al., 2009) (Perry, et al., 2009) in the form of a well-organized, structured, balanced and choices-affording (Fullerton, 2008) (Rouse, 2001) game (Oaxland, 2004) (Rollins, et al., 2004) (Sylvester, 2013), from which meaningful play (Salen, et al., 2004)(Sylvester, 2013) arises.

- Game design consists of designing games by working with principles and components of games (Järvinen, 2008), especially rules (Schell, 2008)(Salen, et al., 2004) (Oaxland, 2004) (Rogers, 2010) (Rouse, 2001) and goals (Brathwaite, et al., 2009), as well as metaphors (Järvinen, 2008); while communicating those ideas to the other members of the development team (Rollins, et al., 2004).

- Game design spans from the beginning of the development or production of the game; and continues thereafter in the form of supervision and verification (Fullerton, 2008) (Pedersen, 2003) (Rouse, 2001) (Bates, 2004) (Rollins, et al., 2004) (Schell, 2008); it implies such activities as conceptualizing, prototyping (physical and digital) playtesting, design documenting, as well as working on the functionality, balance, completeness, fun and accessibility of the game (Fullerton, 2008) (Pedersen, 2003) (Oaxland, 2004) (Bates, 2004) (Rollins, et al., 2004) (Schell, 2008) (Salen, et al., 2004) (Rogers, 2010).

These definitions will now be structured according to the main concepts from design research around which the theories of this dissertation revolve[11]: the design, the designer, for whom the design is for, or the user, the client, the activities the designer undertakes, and within which frame of the development process[12] the design is performed. The following is a table presenting the definition of game design in columns. At the foremost left, it is possible to read the concepts from design research applying to each block of the definition. At the right, I attempt to present in a logical and eloquent way the diversity of ideas revolving around the term according to several authors. The definition is as follows:

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[9] It is important to consider the origin and characteristics of game design texts within game studies. Texts explaining thoroughly game design are not academic texts; they are mostly books written by industry veterans. A few exceptions are works by academics such as *Game Design Workshop* (Fullerton, 2008) or Rules of Play (Salen, et al., 2004). All of these texts, both by industry people and academics, are considered essential within game studies for the dissemination of game design knowledge and the understanding of game making. However, most academic papers dealing with game design do not focus on explaining this concept, but rather present a contribution or application of it, such as some of the contributions discussed in this chapter. This kind of distinction between academic and non-academic texts is crucial to grasp that game design as a focus within game studies has nurtured from knowledge gained without the following of scientific methods.

[10] The term game designer is used here as it is presented by game design literature.

[11] These concepts are explained thoroughly in chapter 4.

[12] Design and development are not treated as the same concept. Design is seen as an event of "expanded rationality", where something not previously conceptualized becomes part of human knowledge expanding the reality (Hatchuel, 2002). Development or production refers to the manufacturing of the design. Further explanations about this and other design research concepts are presented in the next chapter.

Concepts from design	Definition of the term consolidating the views from diverse authors	
(DESIGN)	**Game design is**	the process of creation of an experience collated and shaped by rules, goals, structures, themes and ideas (Rogers, 2010)(Salen, et al., 2004) (Brathwaite, et al., 2009) (Perry, et al., 2009) in the form of a well-organized, structured, balanced and choices-affording (Fullerton, 2008) (Rouse, 2001) game (Oaxland, 2004) (Rollins, et al., 2004) (Sylvester, 2013), from which meaningful play (Salen, et al., 2004)(Sylvester, 2013) arises;
(DESIGNER)	**undertaken by**	the *game designer*[13] (Fullerton, 2008) (Pedersen, 2003) (Oaxland, 2004) (Bates, 2004) (Rollins, et al., 2004) (Schell, 2008) (Salen, et al., 2004) (Brathwaite, et al., 2009) (Rogers, 2010);
(USER)	**for**	the player / players (Salen, et al., 2004) (Rouse, 2001)(Sylvester, 2013) (Fullerton, 2008) (Järvinen, 2008) (Järvinen, 2008) (Rogers, 2010) (Bates, 2004) (Brathwaite, et al., 2009);
(FRAME OF ACTION)	**within the scope**	of the creative effort at the beginning of the development or production of the game; and continuing thereafter in the form of supervision and verification (Fullerton, 2008) (Pedersen, 2003) (Rouse, 2001) (Bates, 2004) (Rollins, et al., 2004) (Schell, 2008);
(HOW)	**revolving around**	working with principles and components of games (Järvinen, 2008), especially rules (Schell, 2008)(Salen, et al., 2004) (Oaxland, 2004) (Rogers, 2010) (Rouse, 2001) and goals (Brathwaite, et al., 2009), as well as metaphors (Järvinen, 2008); while communicating those ideas to the other members of the development team (Rollins, et al., 2004);
	implying such tasks as	conceptualizing, prototyping (physical and digital) playtesting, design documenting, as well as working on the functionality, balance, completeness, fun and accessibility of the game (Fullerton, 2008) (Pedersen, 2003) (Oaxland, 2004) (Bates, 2004) (Rollins, et al., 2004) (Schell, 2008) (Salen, et al., 2004) (Rogers, 2010).
(CLIENT)	**and commissioned by**	a producer / publisher.

Table 3.1. Analysis of the definition of game design based on concepts from the discipline of design

I will now expand this formulation on game design and present a broader perspective on what each of these components entails:

1. **Design.** What is that the designer of games designs? Most authors agree that gameplay. Gameplay is defined as the interactive experience (Fullerton, 2008) (Rouse, 2001) enabled

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[13] Literature uses the term game designer to refer to the creator of the game, reason why it is also used in this definition. However, this dissertation refers to this practitioner as the designer of games, as explained in chapter 1.

by the game[14] (Schell, 2008), where a relationship is established between the player and the game system and the choices and actions of the former have a response from the latter (Salen, et al., 2004). This experience is not the same as the game (Schell, 2008). The designer configures directly the different elements of the game, she has total control on defining rules, goals, procedures and any other game components. Once these elements are enacted by the player, they provide a specific experience. This experience however, is indirectly designed, since what the player experiences is result of the dynamics and emergence of the different game elements turned into action (Salen, et al., 2004).

2. ***Game designer*[15].** Game design literature pictures the designer of games as the person responsible for the overall play experience (Fullerton, 2008) (Schell, 2008) (Rouse, 2001); as the one who has to make sure gameplay works at all levels (Fullerton, 2008). The designer is the creative within the development of a game; and even though some skills and knowledge in art and programming are quite convenient within the practice, the designer is not responsible for such duties. Instead, the designer needs to convey the vision revolving around the game experience to the people taking care for these and other responsibilities within the production of the game (Schell, 2008) (Rouse, 2001) (Rogers, 2010). The designer needs a flair for games and play, and foremost, at any decision taken, the designer must advocate for the player (Fullerton, 2008) (Bates, 2004) (Brathwaite, et al., 2009). Designers must place themselves in the shoes of the player and devise, propose and discover how to provide the player with an appealing, attractive and worth playing experience.

3. **Player.** The player is seen as the specific audience for which the game is especially created. To identify this audience, the literature recommends turning into demographics and psycho demographics (Schell, 2008) as well as market research (Oaxland, 2004) and to the specifications established by the financing or funding entities of the game (Rollins, et al., 2004). Furthermore, a few authors stress on an approach towards game design that they call *play-centric*, which implies that the player is considered through each of the design decisions undertaken as part of the creation of the game, especially through invited feedback, in order to engage an audience (Fullerton, 2008)(Brathwaite, et al., 2009). Yet, this figure of a player in literature consists more of a theoretical figure representing a collection of needs and capabilities guiding the design process rather than a specific player group (Sotamaa, 2007).

4. **Client.** In other fields of design, a client asks the designer to design something for a specific user or audience that is not the client itself. For instance, a medicine doctor may call a designer to design a website for the patients. Similarly, game design literature presents the figure of a client that is in most cases a publisher. The publisher is portrayed as an external organization that either requests the game or to which the game idea is presented for funding and commercialization. Due to the financial participation in the project and their intention to profit, the publisher might have a strong opinion on the creation of the game, from setting the objectives and constraints of the game to even defining the whole direction of the design work (Fullerton, 2008) (Schell, 2008) (Bates, 2004) (Rogers, 2010).

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[14] Except for *Rules of Play* by Salen and Zimmerman (2004), game design literature refers to games as digital or physical assets (board games). Hence, these views exclude games that are intangible and are played by following logical instructions, like *Tag*, *Hide and Seek* or mind games; playful mental activities in which people engage with for leisure while being idle. This observation is important, because it shows that the majority of game design literature focuses on the construction of an object, rather than on the design of play and playful or freeform activities.
[15] The term is used as such because it is how the literature refers to the designers of games.

5. **How to design**. A designer designs games by compositing the different elements that integrate games: rules, goals, procedures, choices, mechanics, dynamics, story, characters, enemies, etc. (Fullerton, 2008) (Brathwaite, et al., 2009) (Järvinen, 2008) (Oaxland, 2004). These elements vary from author to author. Authors also advice designers to observe multiple factors that are crucial for the player and need to be included in the game or play experience, such as rewards, quests, feedback, conflict, as well as elements and features of specific game genres (Crawford, 1982) (Bates, 2004) (Oaxland, 2004). Additionally, numerous aids, methods vocabularies and models have been proposed with the intention of facilitating game design work (Bukhart, 2005)(Bura, 2006) (Dormans, 2012) (Koster, 2005) (Hunicke, et al., 2004) (Despain, 2013) (Kreimeier, 2003).

6. **The scope of design**. The stages in which the designer works have been synthetized as an iterative cycle consisting of conceptualizing, prototyping, playtesting (Salen, et al., 2004) (Schell, 2008) (Sylvester, 2013) (Bates, 2004) and evaluating (Fullerton, 2008). Some game design authors also add documenting to this cycle (Fullerton, 2008). The different stages are also seen embedded in the game development process, specifically as a creative and design-oriented stage taking place preceding the production of the game; prior to the phase in which programmers and artists work on the assembling of the game (Fullerton, 2008). This implies that game design comprises the initial steps in which the game is created; it is when the idea is generated, structured, tried out and evaluated, and once all these actions are done the development continues further on until the completion of the game (Fullerton, 2008). Once the stage for the design of the game ends, the production phases start; then the role of the designer of games shifts from creating and designing to supervising and documenting the development process (Pedersen, 2003) (Bates, 2004) (Fullerton, 2008) (Oxland, 2004). The four phases of the design cycle of games are as follows:

1. **Conceptualization.** The moment in which the idea for the game is created, when the whole player experience including all its layers of interaction gets formulated (Fullerton, 2008). Game ideas can come from the designer or from the developing team; game ideas can emerge as remediation of existing games (Hagen, 2009), or be based on a story, on a specific mechanic for the player to perform, or be developed based on a feature or affordance of a specific kind of technology, i.e games that are designed based on features of virtual reality technology (Rouse, 2001). Game ideas can arise with or without specifications around them, what is called "blue-sky", or from a given theme or setting, called "slow boil", or even be dependent on a copyrighted concept such as a movie theme (Brathwaite, et al., 2009). The methods mentioned for the generation of game ideas vary, from inspiration to the undertaking of leisure activities, as also especially brainstorming techniques (Rogers, 2010) (Bates, 2004) (Fullerton, 2008).

   Game design authors coincide on seeing conceptualization as the stage in which design goals are set and constraints surface. This entails that the direction of the design is grounded, the problem is stated. An example is how to make a videogame recounting the story of Hansel and Gretel (Schell, 2008). Specifications and limitations to the design work appear based on the idea to be developed, and they can be based or depend on budget, time-frames, target audience, genre, compulsory features, platform, technical and market restrictions, among others (Brathwaite, et al., 2009) (Fullerton, 2008). When the idea is defined, its feasibility is also explored, especially technically (Rollins, et al., 2004), as well as research related to the topic or the development of the game can be undertaken (Pedersen, 2003).

2. **Prototyping.** The creation of a working model or a playable form of the game idea. Its purpose is to test and explore through different design concerns (Fullerton, 2008). Prototypes are developed around design questions that are tried to be answered or explored; examples of these questions can be: does this mechanic work? Is this feature attractive for the player? (Schell, 2008). Prototypes in literature are prescribed to be developed first as physical forms of the games, as board games, and then to be developed digitally, with the intention of saving development costs in case of finding out the idea is not worth pursuing after playing with a physical form (Fullerton, 2008). Likewise, prototypes should be developed in the quickest and most economical way, with low quality artwork and sound features (Fullerton, 2008).

3. **Playtesting.** It is more than the playing and discussing of the game or a prototype with potential players or with fellow professionals; and it is definitely not bug fixing or usability testing (Fullerton, 2008). Playtesting is the task of gaining insight on whether the game so far designed achieves its proposed goals or not (Fullerton, 2008). This is the moment in which the designer has to find out if the game is what it is intended to be (Schell, 2008), it is an evaluation point (Rouse, 2001) to identify strengths and weaknesses of the game design (Brathwaite, et al., 2009). As a car is tuned, a game is also tuned (Oxland, 2004), however, as the development of the game advances, the possibilities to make changes or fixes decrease because production constraints demand that the game approaches its delivery date; and bigger changes would push that date forward or are simply very expensive to do (Fullerton, 2008).

   Playtesting has several general focuses. One focus is on functionality, which is discovering if the game is so understandable that a person could play it without any additional information or aid (Fullerton, 2008). Another focus is completeness, which entails, among other things, verifying there are no loopholes, dead ends, missing elements or features that do not work as intended while running the game (Fullerton, 2008). One more focus is balance, which implies studying the game as an ecosystem and adjusting all its minimal details such as level of difficulty, economies, complexity, and rewards, among other elements and features, until reaching an optimal equilibrium (Schell, 2008) (Oxland, 2004) (Rollins, et al., 2004). When testing for balance, it is investigated if the game is too easy or too difficult so that the game can be adjusted to a desired level of challenge. As well, testing is conducted to find out if the game retains the attention and interest of the players as well as to discover if it is appealing to them, what authors refer to fun (Fullerton, 2008).

4. **Documenting.** It consists on capturing the details and specification of the design; it should compress the whole vision of the project (Fullerton, 2008). Its purpose is to keep track of the work and especially to facilitate communication among all the people involved in the creation of the game (Schell, 2008). Moreover, some game design authors see documenting as a useful aid to externalize and sharpen ideas, as a manner of reflecting on the design work (Crawford, 1982) (Rouse III, 2001). The number of documents elaborated by the designer and referred to in the game design literature is vast and differentiated by the kind of professionals involved in the use of the documentation and the stage of the design of the game. For instance, in the early beginning of the design, and to convey the idea to a publisher, a short and concise document is recommended for pitching the most attractive characteristics of the game. While for the whole design process and to communicate with the main game development team the so-called design document is prescribed, which is a very detailed and exhaustive text on each and every detail of the game that has to be constantly updated until the shipping of the game (Fullerton, 2008)(Schell, 2008)(Rogers, 2010) (Bates, 2004).

The names used in the literature for the design documentation are very varied. Some of these documents are: the high concept document, the one-pager, the five-pager, beat chats and post-mortems (Rogers, 2010) (Bates, 2004). Even though some authors picture the role of the designer as mostly getting the idea at the beginning of the development process and then just focusing on evangelizing the team on the game by working just on documentation (Pedersen, 2003), research has shown that documenting is not a regular practice within the industry (Nevelsteen, et al., 2009) (Neil, 2012).
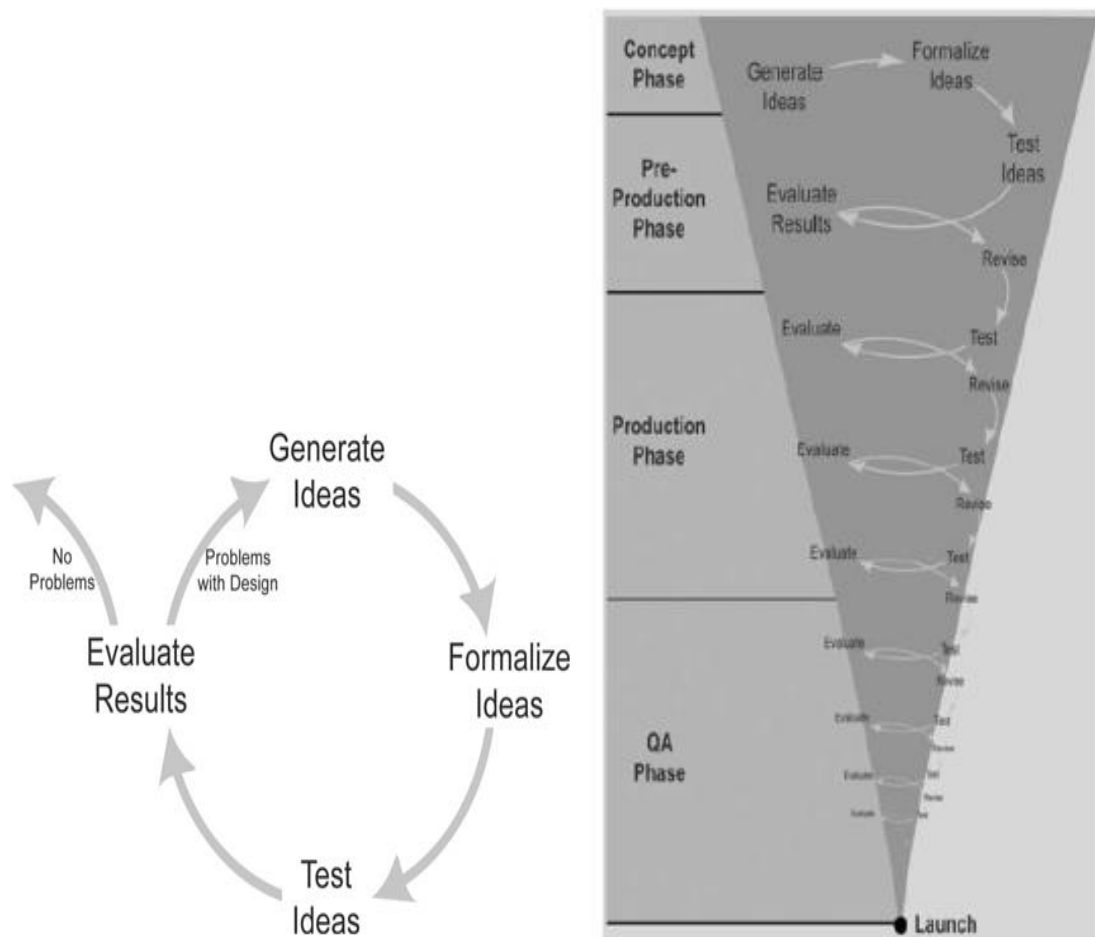
Illustration 3.2. The game design cycle and the pipeline for the development of a game.
At the left, a diagram of the design cycle of a game presented by Tracy Fullerton (2008 p. 15). This cycle is iterative and starts with the generation of ideas and continues with the formalization, testing and evaluation of them. If problems are encountered during the cycle, a new iteration begins; if not, the design cycle finishes and production starts. At the right, a diagram of the development process in which the designing cycle is immersed as a spiral narrowing scope as the development of the game progresses. The design cycle is fully undertaken at the concept phase of development and extends briefly into the pre-production phase. Once the design cycle encounters no problems and concepts and ideas are set, the production phase kicks off and the design cycle turns into a cycle for supervision characterized by the testing and evaluation of the game. No further idea generation or design takes place in these latter stages. The game is developed then by programmers and artists and tested by quality assurance staff. At this stage the designer overviews the production of the game and documents the process. At the end of the production phase and after intensive quality testing and assurance, the game is eventually released (Fullerton, 2008 p. 249) .

BRIEF HISTORY AND CURRENT TRENDS IN GAME DESIGN

Game design has evolved with time. Not only games have become more sophisticated over the years. The understanding of games and play has sharpened as the contexts for the study, teaching and undertaking of the design of games have appeared, blossomed and consolidated. The evolution of game design is strongly related to the history of digital games and to the evolution of game studies.

For Gundolf S. Freyermuth (2015) game design history consists of four phases: the years of the appearance of the first video games, the boom of arcade games and entertainment electronics, the establishment and consolidation of the game industry, and the turn of the industry into the "democratization of tools"[16] through indie games. The first phase dates back to the decades of the 1950s and the 1960s and took place within an academic hacking culture. It was around this time that *Spacewar!* (Russell, 1962) was created at M.I.T. Freyermuth considers the production of *Spacewar!* as handcraft manufacturing, for being produced by an individual. As a scientific project, the game was free of cost and available to people for expansion; the game was an open-source development. Due to these characteristics, Freyermuth (2015) finds this game as not differing from other software innovations of the time.

The second phase of game design history according to Freyermuth (2015) starts around the decade of the 1970s with the boom of analog entertainment electronics and the arcade games industry. For Freyermuth the development of these entertainment commodities was still handcrafting because the developers and programmers were still individuals or small teams. This design characterized by following rational and agile principles for the designing of analog objects as well as for the following of processes of a nascent software design.

During this phase a precursory game design text appeared, *Gaming: The Future's Language* by Richard Duke (1974). Duke did not see games as products, but rather as "happenings", and his understanding of games was based on models of communication, gaming as a communication form. Duke saw game design as a combination of mimicry of existing game formats and styles, as an art with design principles.

Moreover, Duke depicted the game design process as three phases: design, construction and use; where design consisted of generating a conceptual map, of the gestalt composed of many different ideas to convey in an ambiguous, thorough and understandable way the message for techniques for game creation. He does not dig into most elements that compose his models, though. However, these models are so extensive and descriptive even if developed in the 1970's (see illustrations 3.3 and 3.4).

According to Freyermuth (2015), a third phase of game design history started three decades ago, when a game industry consolidated and the design of narratives and audiovisuals for digital games matured and became complex. During this phase handcrafting disappeared and was replaced by an industrial tradition with its own divisions of labor and areas of specializations focusing on the technological, artistic, organizational and economical facets of

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[16] Chapter 2 presented Paolo Ruffino's (2013) point of view about the democratization of tools, and how he conceives this event not as a more pluralistic accessibility to the tools to make games, but rather as the new structuring of the industry to avail on new types of labour represented by the so-called indie designers of games. Additionally, I presented arguments showing that the discourse around "free tools" to make games is fostered by the companies and accepted by independent designers as part of their ideology.

digital game production. The industry structured itself in the form of development studios and publishers and ran following its economical practices (Freyermuth, 2015).
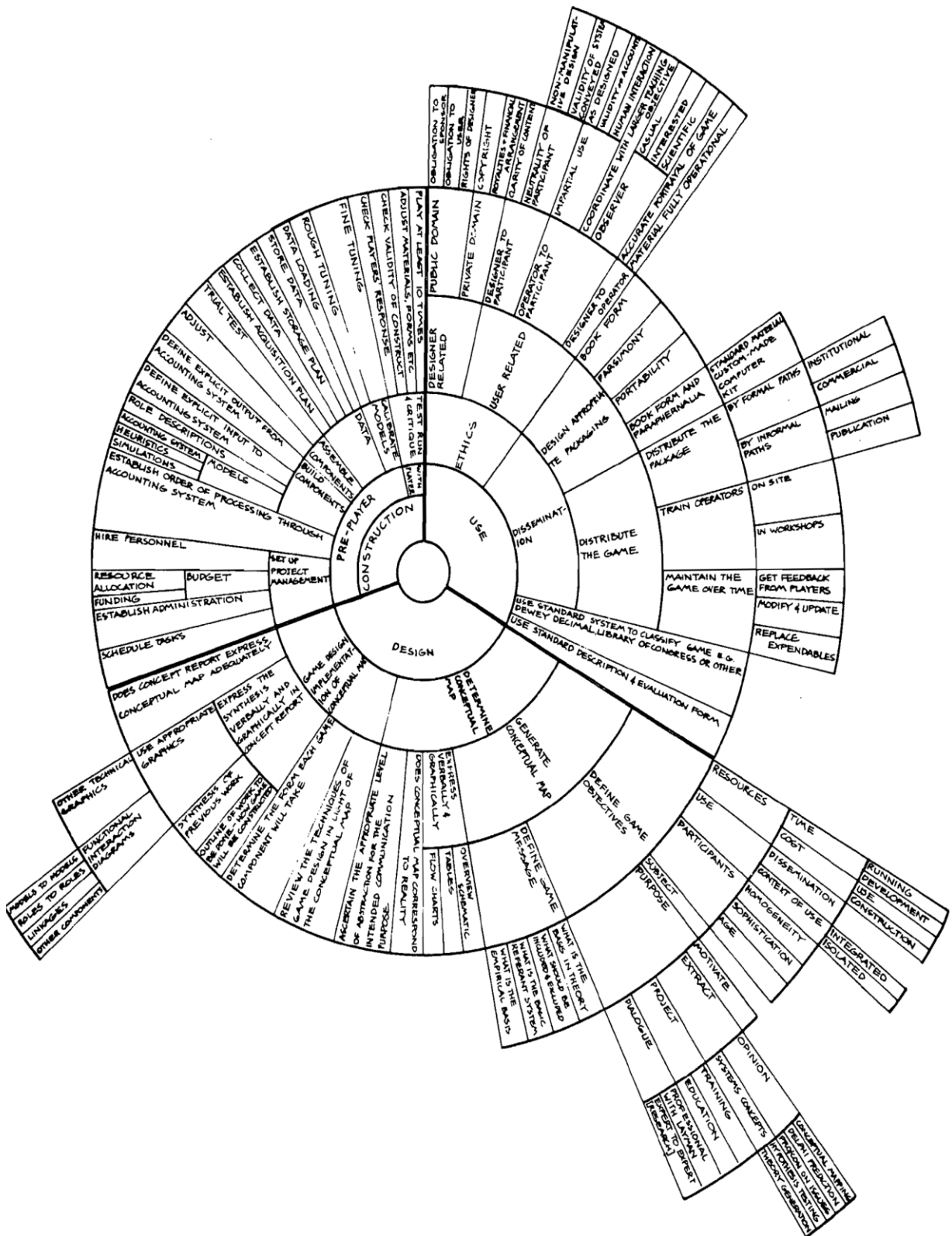
Illustration 3.3. The game design process as presented by Duke (1974 p. 74).
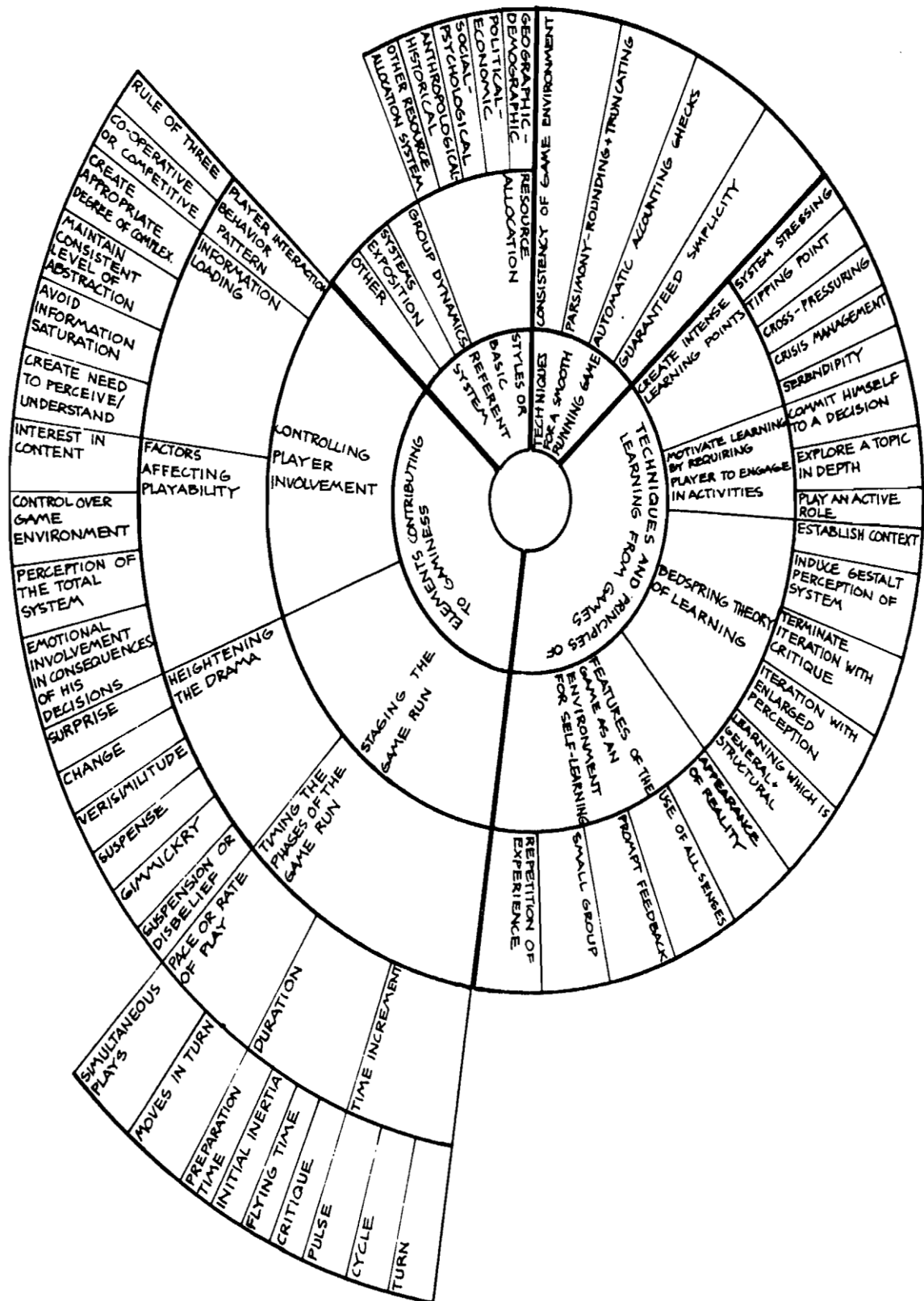
Illustration 3.4. Repertoire of techniques for the design of games according to Duke (1974 p. 134).

This is the phase of the formalization of game design and the proliferation of game design books and contributions with the objective of aiding the design of games. First, Chris Crawford presented *The Art of Computer Games* (1982), where he shares his vision on what the designer of games does. Crawford creates a complex network of paths to show players all possible facets of a single truth with the purpose of educating or entertaining. Years later, Doug Church (1999) presented what he called the "formal abstract design tools". And, besides calling members of the game community to come up with a terminology for games, he mentions that the design is the game, the experience the game represents. Church says that design is the least understood aspect of games, and it includes the vision, the art, the code, the levels, the sound, and putting all these together as part of an experience.

The first years of the decade of the 2000's ushered a larger discussion about games and game design, with some texts that have become classics within game design and game studies. Richard Rouse III (2001) in his robust *Game Design. Theory and Practice* explains that game design is about determining the gameplay, specifying the choices for the player, defining win and lose criteria, how the user will control the game and what information will be communicated to the player through the game. Moreover, Rouse provided a broad view on how the game industry worked back in his time, by explaining the design and development process, talking about documentation used in the industry, level design, as well as presenting interviews with industry veterans.

Afterwards, Greg Costikian (2002) presented his popularly *referred I have no words I must design: Toward a critical vocabulary for Games* where he tried to orient readers on how from his perspective games should be done and tried to differentiate games from other media. Chris Crawford in *On Game Design* (2003) elaborated on Costikyan's view of games also differentiating game design from other activities related to games by pointing out that game design was not the same as programming, and that designers of games focus on challenges and guidelines for a game.

The decade of the 2000's spawned many game design textbooks by designers of games who had worked several years in the industry, but also books that have strongly influenced the undertaking of game design and its teaching: *Rules of Play* (Salen, et al., 2004) and *Game Design Workshop* (Fullerton, 2008). In *Rules of Play*, Katie Salen and Eric Zimmerman (2004) envision game design as the creation of meaningful play, implying that the player has to make relevant choices; that for each discerned action the player takes, the game provides an output. Moreover, game design for Salen and Zimmerman is more than the design of a system, for them gameplay design is the design of play, the design of experiences that can be social, narrative, ludic, pleasurable and that imply participation, observation, a mental state, bodily sensations, something that has to be lived.

On the other hand, in *Game Design Workshop* Tracy Fullerton (2008) lays in game design the responsibility of creating the experience of the game for the player even beyond the first stages of creation of the game. For Fullerton the designer is responsible of the game until the very end of its production. Fullerton's vision of game design is what she calls the *playcentric approach*, where the player is the main factor as part of the design of the game. Moreover, from Fullerton's perspective, game design can also include working on the narrative of the game, level design, documenting, prototyping, reviewing and supervising tasks, etc.

The fourth and last phase within the history of game design according to Freyermuth's (2015) took off with indie games. For Freyermuth this period originated with the democratization of means for production, the globalization of product distribution and a crisis in the AAA industry. Additionally, Freyermuth sees the design practices of indie game developers as pre-industrial,

as a craftwork revolving around the use of open-source tools that could benefit by emulating the game design of big studios. This last phase has also spawned a few important game design books, such as *A Game Design Vocabulary* by Anna Anthropy and Naomi Clark (2014), where these designers identify elements of games and present only indie games to exemplify their concepts.

1960s First computer games → **1970s** Arcade games and playful electronics → **1980s and 1990s** Game industry's era / game design literature → **The 2000s** **Indie games**
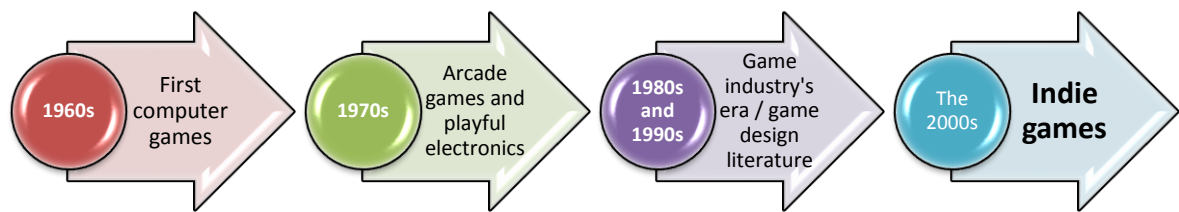
Figure 3.5. Representation of Freyermuth's (2015) four phases of the history of game design

The history of game design can also be tracked within the establishment and maturity of game studies. In *An Introduction to Game Studies. Games in Culture*, Frans Mäyrä (2008) mentions a few episodes that can be considered precursory in the study of the design of games. Mäyrä accounts of writings from the 18th century in Germany where the game Chess was used as a tool to teach about tactics and strategy of war to pageboys. These texts consisted of the analysis of the creation of such learning experiences on the rules of military art for some of the servants working under the ruling of the Duke of Brunswick.

Mäyrä (2008) also talks about the East Coast War Games Council, a group of American war gamers that discussed war games and published proceedings of their meetings in the 1960's. These group later on changed its denomination to National Gaming Council (NASAGA) with a focus on learning through simulation. This organization also paved the way to similar initiatives studying play and related aspects of games, such as The Association for the Study of Play, also known as TASP in the 1970's. The TASP in turn favored the appearance in the 1980's and 1990's of other publications, like the *Play and culture Journal*, the *Journal of Play Theory and Research* and *Play and Culture Studies*.

Moreover, before Espen Aarseth's statement declaring 2001 as the year one of computer game studies as discipline, there had been already a change in paradigm in the discourse around technology. According to Mäyrä (2008), technology experts had started to talk about the *design of experiences* instead of applications and features. Years later, once game studies gained momentum, the design of games became one of the many routes this discipline focused on. And an important note in this regard, is the trend within game studies of forming its own scholarly approach, of building a discipline explaining the phenomena of games with its

own means and methodology (Mäyrä, 2008). This implies that game design has been constructed, explained and developed under the own terms of the members and contributors of the game studies schools and traditions.

In recent years, game design has become a relevant focus within game studies. As Sebastian Deterding (2016) explains, game studies has responded to the demands of the market through game design programs; through the formation of designers. As well, Deterding finds game design as an adequate direction for game studies to thrive. Besides the nowadays popular programs and degrees in game design, which can be platforms for the discussion and for the dissemination of theories of the discipline, Deterding considers the research within game design a promising field gaining relevance due to the development of new technological applications and the political and economic shifts that technology drives.

From an academic standpoint, a new trend for game design has appeared; an effort to lead the study of game design to a more design-oriented perspective. This trend is referred to as game design research in reference to design research, the discipline for the scientific study of design from the field of design[17]. For instance, Annakasia Kultima (2015) in her paper *Game Design Research* reviews all the collaborations and theories within game studies with implications in design and points out that there has been a lack of conversation between game studies and design research. As well, Kultima (2015) analyzes how the constraints given to the participants at the Global Game Jam 2012 are treated either as an inspiration or as a constraint, and how this matches the design paradigms of *problem solving* (Simon, 1996) and *reflection-in-action* (Schön, 1983).

Jussi Kuittinen and Jussi Holopainen (2009) also aim at bridging design research and game studies, by presenting Lawson's design model (2005) and drawing parallelism between this model's elements and the content of some of the most popular game design texts. And more recently, the book *Game design Research* (Lankoski, et al., 2017) was published. In this text, contributors talk about different design ontologies and frameworks existing within game studies (Dormans, et al., 2017) (Chiapello, 2017), research though practice (Coulton, et al., 2017) and experimenting with game design (Waern, et al., 2017), among others.

Even though current efforts within game studies try to bridge the discipline with design theory or design research, the study of design for game design has still a long way to go. There is a lack of works within game studies dealing with the undertaking of design and what doing design implies. There is not a complete interpretation of the views on *problem solving* (Simon, 1996) and *reflection-in-action* (Schön, 1983) when it comes to study the design of games. As well, there is not much knowledge on how designers undertake design and deal with challenges in their practice (Neil, 2012), and many of the prominent game design contributions are just popular among academics but unknown and without applicability in work contexts of game practitioners.

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[17] More about design research, its definition and applicability for the study of game design is presented in the next chapter.

PROMINENT GAME DESIGN CONTRIBUTIONS AND THEIR PRACTICAL APPLICATION

In 2003, in a *Gamasutra* article Bern Kreimeier surveyed the state of game design as discipline to identify game design methods (Kreimeier, 2003). He expanded on a previous *GDC* talk from 1999 by Doug Church addressing the need of "formal abstract design tools" (FADT) for game design. Kreimeier intended to identify the equivalent in game design to storyboards and scripts in film production and see if these elements could also be applicable in games. In the article, Kreimeier listed the game design document, anecdotes of industry veterans, the notions proposed by Church known as the "FADT" (1999), the 400 rules project (Barwood, et al., 2006), vocabularies and terminology developed by other contributors, as well as patterns inspired by Alexander's architecture (Kreimeier, 2003).

Years later, as part of his dissertation, Aki Järvinen (2008) mentioned that from his experience game design literature is inspirational and relies in the ability of the reader to find methods and practices to transform the information to concrete results, to turn the knowledge into games. In 2012, also as part of his dissertation, Joris Dormans (2012) surveyed once more the state of game design as discipline and pointed out that there is not much of a distinction between analytical and design methods and tools, since the terms are used interchangeable in the literature.

With a focus on tools for design, Katherine Neil (2012) argued in her dissertation that designers fall short on formal and abstract tools for their work, and that even though some standard practices do exist like the game design document or prototyping, the applicability and implementation of these elements differ greatly from project to project and have not been effectively surveyed. Later on, Orita Almeida and Correa de Silva (2013) analyzed and systematized all the prominent game design contributions within game studies and came up with the mapping of all the existing proposals (see illustration 3.6). As part of the outcome of this work, Orita Almeida and Correa de Silva (2013) concluded that there is a lack of tools for a game design practice.

In a video of a talk at *the Game Developers Conference*, Stone Librande (2015) argued that game design discussions are oftentimes about "game", "game" and more "game", referring that most contributions tend to revolve around game elements without really breaking into design, into the designing of games. As part of his argument, Librande addressed the audience advocating for the creation of their own design models and hinting on how some design methods embed within a model. Librande mentioned sketching, modeling and prototyping and how these design methods have aided the design of very popular objects and software in other disciplines.

Later texts surveying the state of game design (Dormans, et al., 2017) allocate prominent contributions within the same box; as elements ideally aiding practitioners in their designing activities but without differentiating their practical applicability and level of abstraction. This lack of differentiation has caused skepticism about the practical applicability of game design proposals (Dormans, et al., 2017) as well as has inhibited the propagation of theoretical game design knowledge among practitioners.
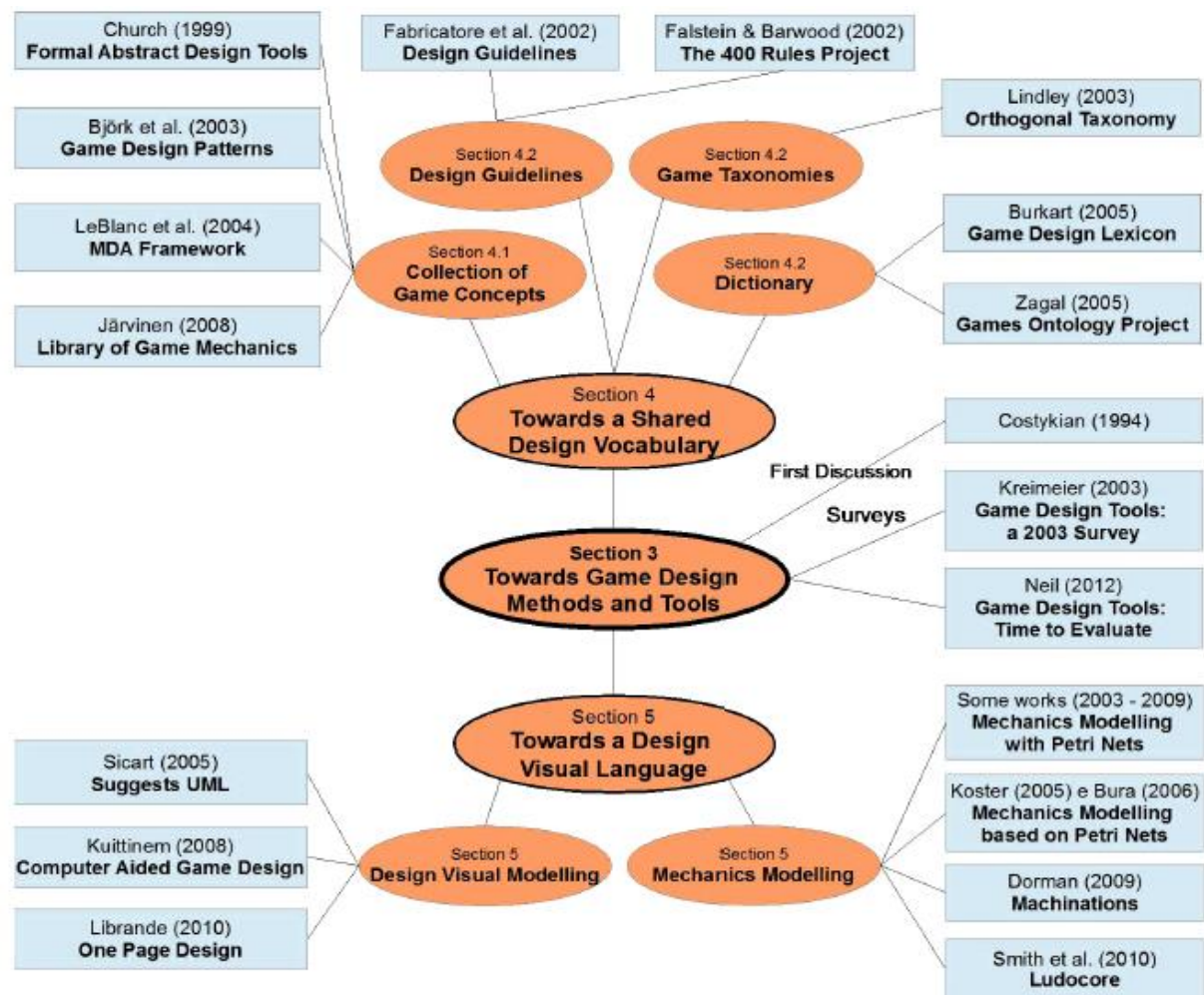
Illustration 3.6. Methods and tools in game design by Orita Almeida and Correa de Silva (2013 p. 20)

The previous paragraphs have presented an overview of the problem game design contributions face regarding their practical applicability. A problem several academics and industry veterans have noted. I have presented arguments about this issue at the beginning of this section in order to contextualize the current state of game design for guiding and supporting the actual and practical design of games.

Since this dissertation revolves around the design of games as undertaken by the so-called indie designers, the aspect of practical applicability in game design is crucial. Because of this, it is necessary to grasp how the game design from game studies can be practically applied by designers while designing games. The intention is to envision to what extent the different game design contributions afford practical applicability. By reaching this understanding, it will be then possible to analyze and compare the two kinds of design for games, the one from game studies and the one undertaken by the so-called indie designers.

Hereafter, this research presents the most prominent contributions within game studies with a focus on the practical applicability afforded to designers for the design of games. The contributions are as follows:

   a) *Formal Abstract Design Tools* by Doug Church (1999). In an article on the website *Gamasutra,* designer Doug Church called out for the creation of a vocabulary that

could help define elements of games. He thought other fields like cinema had a terminology, but games did not. Church's approach consisted in empirically analyzing a few games based on what he considered their strengths. Through this exercise he identified the following concepts: intention, perceivable consequence and story. Church called this exercise "formal abstract design tools" or FADT and intended to show other people how to do such an exercise themselves; it had the intention to be a model for the analysis of games and the subsequent use of the identified vocabulary for the creation of games. As a contribution, Church's work represents an example of how to do the analysis of the elements constituting a game experience. However, Chruch's FADT in game studies has passed as vocabulary or collection of terms rather as an analytical method.

b) *I have no words I must design* by Greg Costikyan (2002). In this text Costikyan presents his vision of what games are by offering definitions of the concepts game and goal. He explains that rules articulate games, that games should be structured around a struggle that is presented to the player, and that the player must achieve a goal. As well, Costikyan appeals to the designer to decide what kind of experience to provide to a player. To do such a thing, he recommends getting inspiration from designer Marc LeBlanc's (2004) taxonomy for aesthetic experiences in games: sensation, fantasy, narrative, challenge, fellowship, discovery, expression, submission, etc. Notwithstanding the guidelines Costikyan offers, there is no further detail or specifications on how a designer can apply such a vision. It is up for the designer to decide whether to provide a game experience featuring fantasy, fellowship or submission, and especially to discover how to deliver successfully such an effect.

c) *Game design methods* by Bernd Kreimeier (2003). This was a survey of game design contributions existing in the first half of the decade of the 2000's. Kreimeier listed the game design document, the anecdotic discourse on game making by Chris Crawford in *The Art of Computer Games* (1982), the 400 rules project (Barwood, et al., 2006), the design patterns (Björk, et al., 2004), as well as Church's "FADT" (1999). The article intended to identify design methods within game studies. However, none of the contributions listed by Kreimeier constitutes a design method[18] or offers practical applicability. They either are anecdotes, visions, recommendations or vocabularies that will be discussed in this section. The only exception is the writing of the game design document, which can guide a designer to externalize design ideas and come up with the elements for her game.

d) *Game taxonomies* by Craig Lindley (2003). This model is a tool for the analysis of games. It consists of pyramids with the variables narrative, ludology and simulation situated at the corners and the dual variables chance and skill, virtual and physical, and fiction and non-fiction interchangeably interpolating by the sides of the pyramids (see illustration 3.7). The aim is to position recently brainstormed game concepts or already exiting games across the faces of the pyramids in order to reach a better perspective of the kind of experience a specific game represents. The pyramidal form of the model allows seeing how game concepts fall between the variables and finding out the predominant traits of the games. For instance, in the following illustration at the left, the game form LARPs is situated right in between simulation and narrative, and on the side of fiction, in opposition to non-fiction. While "adventure sports" is situated between simulation and narrative, but almost reaching the corner for the latter variable. This way, it is conveyed that adventure sports are a combination of both

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[18] The term design method is defined extensively in the next chapter.

elements but are most predominantly narrative and non-fiction. The author of the model also intended this tool to be used as a kind of "design crosshair"; as an input or inspiration for brainstorming activities so that the designer positions ideas across the planes of the pyramids or uses the model's variables as design constraints or design goals.
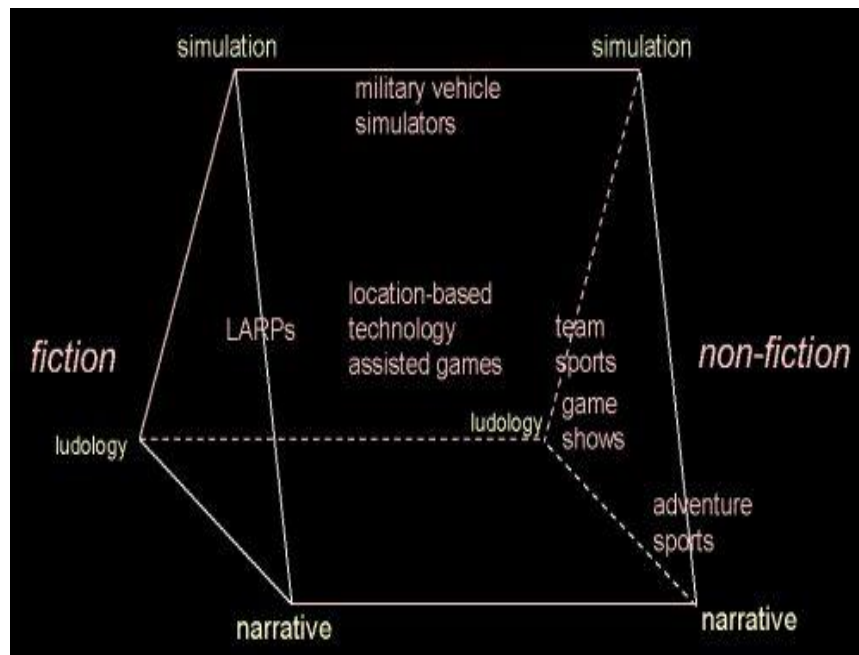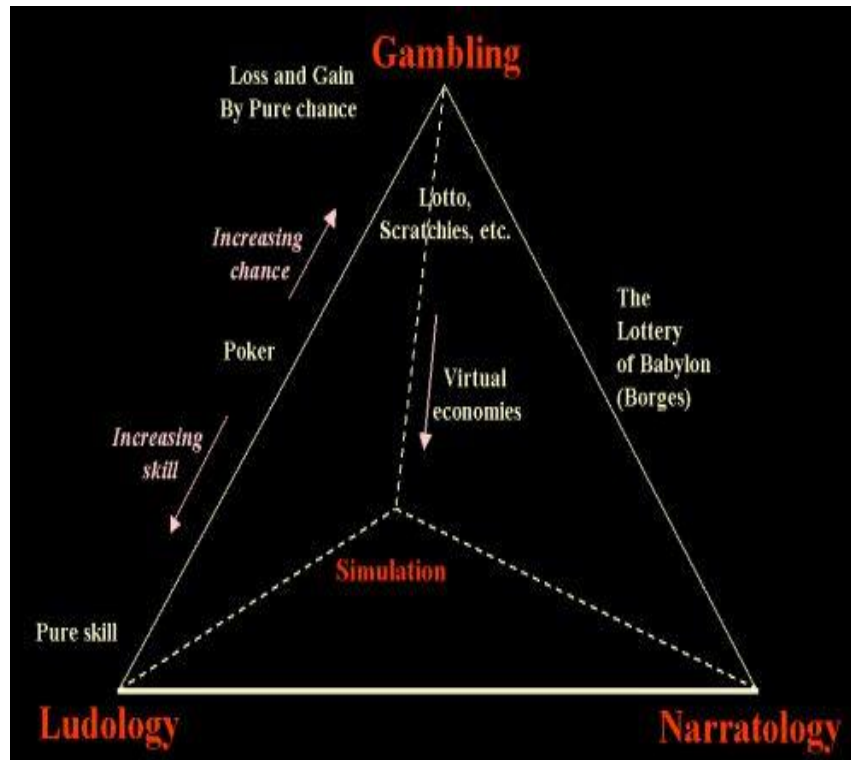
Illustration 3.7. Lindley's *game taxonomies*.
Illustrations game taxonomies model with examples of different games forms and genres positioned through the planes to get a better identification of their characteristics and nature (Lindley, 2003 p. 2).

e) *Game design patterns* by Steffan Björk and Jussi Holopainen (2004). These are descriptions of recurring interactions in games; formalizations of how game components used by a player or by a computer affect different aspects of gameplay. They can constitute goals, rules, actions, evaluation conditions and even objects or interfaces, including dice or controllers. Examples of the patterns identified by Björk and Holopainen are: perceived chance to succeed, analysis paralysis, mutual goal and shared reward, among others (see illustration 3.8). Game design patterns[19] apply to different levels of abstraction: game instances, game sessions and play sessions; which implies they are useful for different hierarchies of implementation. The utility of the game design patters is to be a creative tool for a designer for idea generation, for deciding what game interactions to implement. They can be resources to use when brainstorming a new concept or to work with through other methods for concept generation.

Analysis Paralysis

Description
Analysis Paralysis occurs when a player is confronted with so many possibilities that gaining an overview of what the different consequences will be becomes overwhelming and game play is affected negatively. That many possibilities exist is not sufficient for the pattern to occur; the player has to have a sense that analyzing the situation is possible and will give the player an advantage over other players.
Consequence
Analysis Paralysis forces players to spend time on deciding what to do instead of interacting with the game system. This may led to experiences that the game does not **Allow Game Mastery** and the **Perceived Chance to Win** becomes one of pure luck.For other players Analysis Paralysis mean that the game does not have **Reasonable Waiting Times** but may decrease **Tension** as these players do not have a pressure upon them to do something in the game.
Using the Pattern
Limiting players' possibilities to analyze a game state can remove the consequences of Analysis Paralysis. Having a **Time Limit** sets a fixed limit to the amount of time that can be spend analyzing a situation while **Constant Player Activity** and **Constant Movement** forces a player to continuously weigh the benefits of continuing the analysis with reacting to events in the game. All these approaches do not actually remove the problem of analysis for players but simply enforces that action is taken or the players is negatively affected. Gentler approaches, which do not threaten with punishments, are possible by enforcing a **Limited Foresight** so that the consequences of actions are more difficult to calculate.

Illustration 3.8. Details of one *game design pattern* identified by Björk and Holopainen: analysis paralysis.

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[19] Game design patterns are not the same as game mechanics. These patterns represent game dynamics, the overall system behaviors, rather than the specific actions or mechanics players undertake, which are the mechanics (Järvinen, 2008).

This pattern consists of the game giving so many options to compute that the player ends up overwhelmed by the large amount of information to process. As part of their work, Björk and Holopainen also recommend how to apply the pattern and the consequences it has on the players and in the game (2004 p. 8).

f) *The MDA framework* by Robin Hunicke, Marc LeBlanc and Robert Zubek, (2004) is a model that, according to their authors, is for the understanding, analysis, design and development of games if seen as complex systems. The model is structured within three different but interrelated layers: mechanics, dynamics and aesthetics (see illustration 3.9). Mechanics are the actions, behaviors, controls and mechanisms afforded to the player through rules. Dynamics refer to the run-time behavior of game elements as a whole system driven by player input. And aesthetics are the desirable emotional response of the player while playing the game, which can be, among others, fantasy, challenge, discovery, submission, etc. Through the analysis of the three layers of a game, designers are supposed be able to work their way from the mechanics, through the dynamics and to the aesthetic experience and all the way back to design a game. Furthermore, the authors propose for its implementation a "tuning" work that consists of reviewing and adjusting parameters until accomplishing the desired game experience. Even when proposed at a workshop of the *Game Developers Conference* by industry people, the *MDA* is very popular within game studies. However, it has also been in dispute. There are not many cases documenting its successful practical applicability, as well as some designers such as Daniel Cook (2007) argues that it fails to provide a testable structure to work with. The MDA is one of those cases mentioned by Järvinen (2008), for which designers have to follow their intuition and turn to their skills to know how to create games.
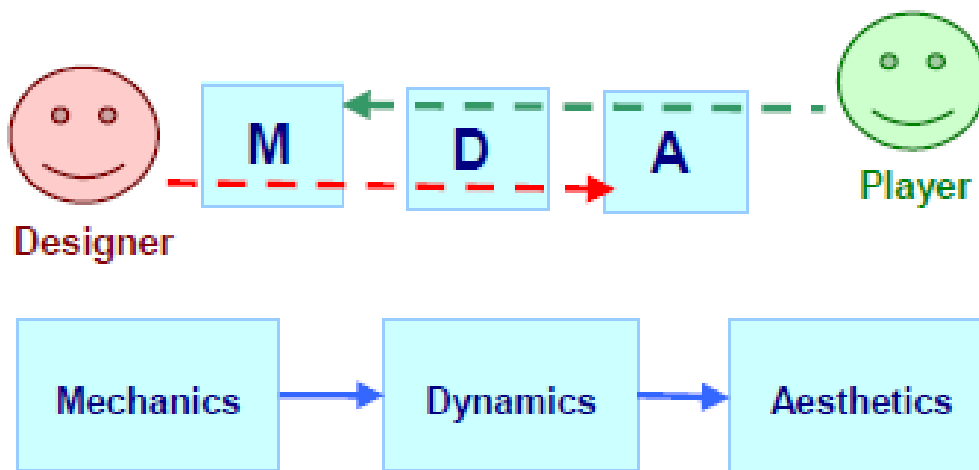
Illustration 3.9. The *MDA framework*.
It depicts the interaction of the designer and the player as two lines finding each other in opposite directions: in one side, the designer designs the game through rules, which in execution afford dynamics and can provide an aesthetic experience to the player of fantasy, submission or discovery. On the other side, the player identifies the aesthetic experience and interacts with the system that is structured by its rules (Hunicke, et al., 2004 p. 2).

g) *Rules of Play*[20] by Eric Zimmerman and Katie Salen (2004). This book has already been introduced previously in this chapter along with its concept of meaningful play. Additionally, Salen and Zimmerman explain their vision around the design of games with what they call schemes, which are: rules, play and culture. The scheme of rules refers to mental and mathematical structures of games; all the elements designers can use to create games, such as a conflict, storytelling, visual aesthetics, social interaction and technology. As for the use or implementation of these elements, Salen and Zimmerman do not specify a way; they just mention there is no magical approach for it. Play as scheme is the experiential part players encounter while playing; this includes the gameplay afforded to the player by the actions she has to undertake while playing, the ludic experience. And the scheme of culture refers to the cultural contexts where the game belongs to and in which it gets meaning; this can be the moment in history where the game appears or even the ideology upon which the release of the game gets sense.

h) *Games Ontology* by José Zagal, Michael Mateas, Clara Fernández-Vara, and other researchers (2005). This is a wiki that provides a common vocabulary for designers of games. With it, its authors intend to offer descriptions for abstract commonalities identified across a wide range of games from a player's perspective, in the form of an interrelated, organized and hierarchical ontology of game elements. The main categories of the ontology are: interface, rules, goals, entities and entity manipulation. Under each of these categories abide many other elements and their respective descriptions and several examples in games. For instance, within goals, the items described are: agent goals, collectables, game goals, goal metrics, optional goals, performance record, required goal, score, side-quest, success level and time. The other categories present a more extensive list of elements. By consulting this ontology, designers can understand the interrelations among game elements and probably get inspired on what elements to include in their creations

i) *Game atoms* by Raph Koster (2005). At a *Game Developers Conference* talk, Koster presented an attempt to having a notation system for game design. Inspired by the scripting systems of music, choreography and poetry, he proposed a grammar based on choice molecules, or "atoms", that could help trace the logical progression, event loops and challenges in games. Koster's proposal was an experiment instead of an already workable solution, though. But opened the door to the generation of other graphical tools for design such as Bura's petri nets (2006) and the *Machinations* (Dormans, 2012).

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[20] The book *Rules of Play* by Eric Zimmerman and Katie Salen (2004) is the only text digging into matters of design by presenting design as *reflection-in-action* (Schön, 1983). This theory is, however, insufficient to explain design. More about this issue will be discussed in the next chapter.
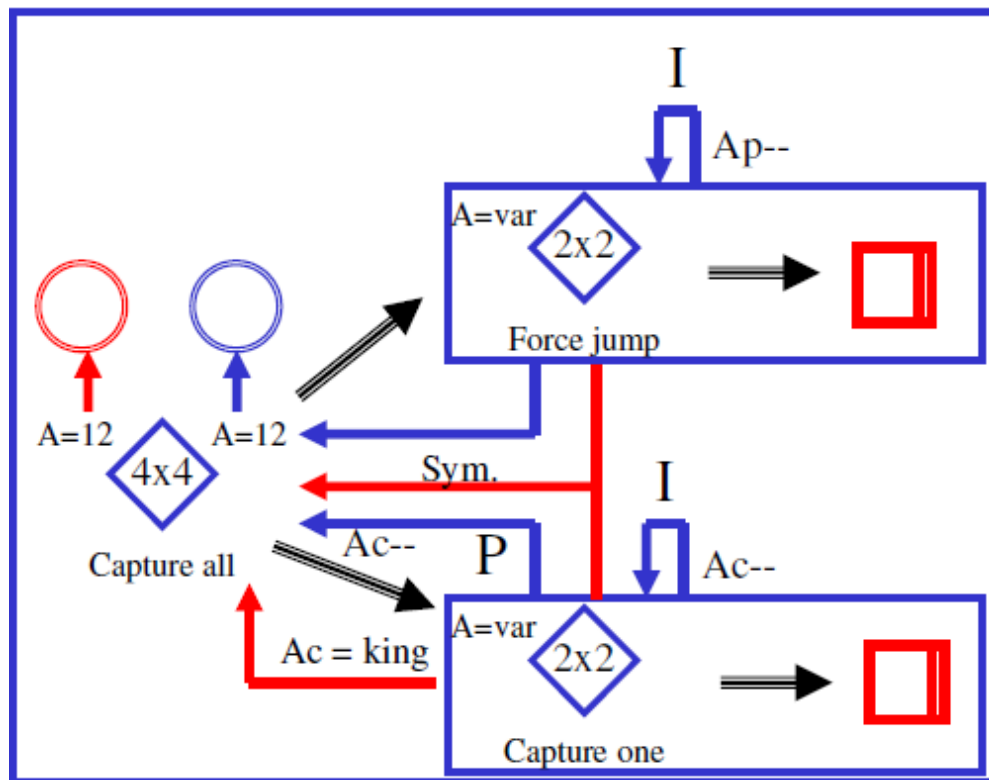
Illustration 3.10. Game atoms by Koster.
Attempt by Koster to trace the logical and feedback loops of the game Checkers with his game atoms (Koster, 2005 p. 108).

j) *Petri nets for game design* by Stephan Bura (2006). This work elaborates on Koster's idea of game atoms (2005) and uses petri nets as graphical tool to represent interactions within games. From Bura's perspective, petri nets allow the visual description of complex game processes, feedback loops and data-flow. Bura argues designers can use petri nets to envision the linking of the different elements constituting a game and by doing that recognize potential winning strategies and play actions. In his paper, Bura presents as example of his argument the loops of alternatives a player has in the game *Checkers*; these alternatives include moving, capturing and sacrificing pawns. The diagram also depicts the logical sequences to be followed by a player to win (see illustration 3.11). As part of his proposal, Bura mentions that petri nets could work out not for visualizing all the structures and elements of a game but just a few of them, and would mostly be useful for visualizing and understanding simple rather than for complex games.
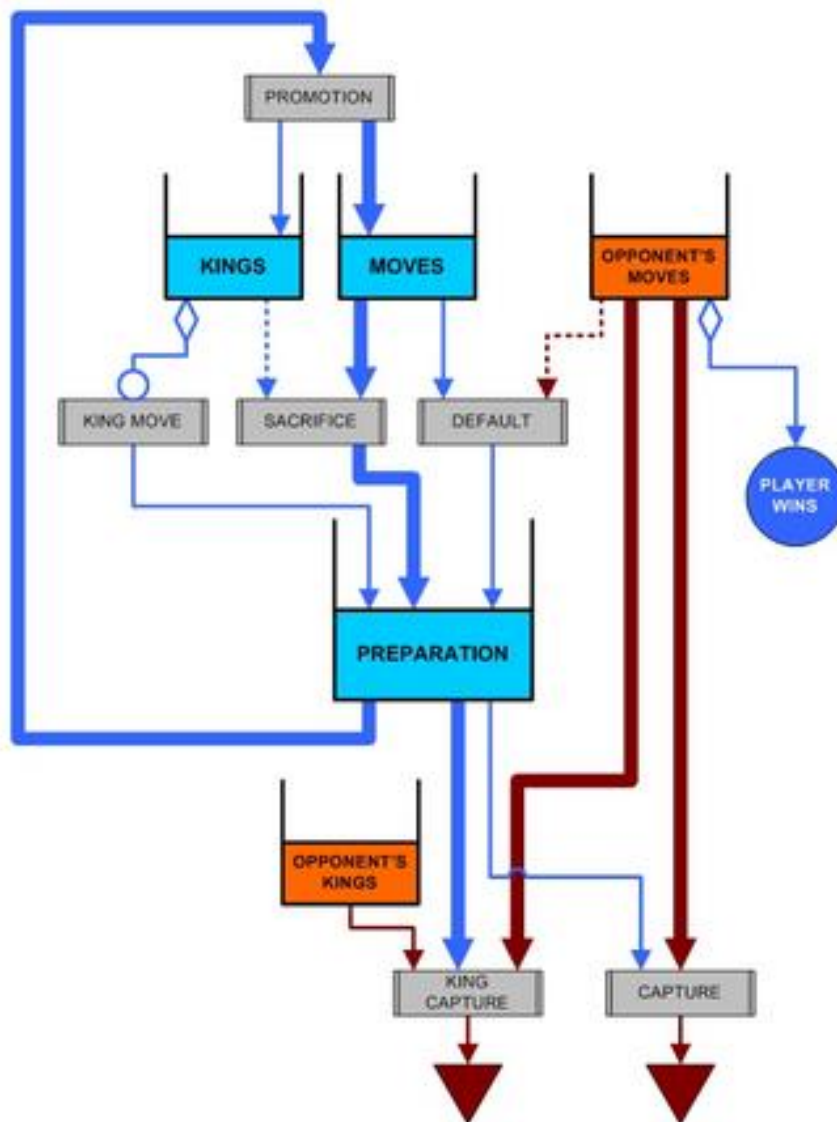
Illustration 3.11. Petri nets by Bura.
Diagram of *Checkers* developed by Bura to present the functionality of petri nets (Bura, 2006 p. 15).

k) *400 project* by Hal Barwood and Noah Falstein (2006). The intention of this initiative was to collect and provide up to 400 instructions on game design that could be used by designers for making games. The authors of the *400 project* wanted to identify the rules of thumb that apply for the making of games in a similar fashion, as there are rules of thumb in other disciplines, such as measuring several times and then cutting for carpentry, presenting all the information in the first paragraph of an article in journalism, and dissolving images of unsolved situations in a film. Examples of these rules are: fight player fatigue, concretize ideas, identify constraints, make effects of the artificial intelligence visible to the player, implement the hardest part of the game first, no bosses in brainstorming and make the game appear fair to the player, among many other rules of thumb. Even though the *400 rules* are useful design recommendations, there is no further detail or information on how to practically apply such concepts. The rules are very ambiguous on how to be implemented, which means designers are left to their own resources and judgments to decide how to interpret and follow these rules of thumb.

l) *Games as components and the GameGame* by Aki Järvinen (2008). Järvinen envisions games as sets of components that can be literally "moved" or transferred, either physically or metaphorically. Järvinen states that every game can be deconstructed into its components and these components can then be reused to design other games. To make his vision implementable to design games, Järvinen proposes the *GameGame* (Järvinen, 2005). The *GameGame* is a brainstorming tool in the form of a card game. Players move or transfer game components represented as cards and by doing such actions they composite games. Players compete against each other, trade cards and have to come up and pitch the most innovative game idea or concept of the session. For example, a player may have the card for the game mechanic "manipulating" and the card for the asset "hype", among other cards. Hence, she will have to formulate a game that encompasses all the elements that her cards estipulate in an innovative and attractive way in order to win (see Illustration 3.12). Järvinen's intention with the *GameGame* is that designers use this game as tool to manually composite games by moving and arranging game components.

Illustration 3.12. Picture of the cards of the GameGame (Järvinen, 2005) by Aki Järvinen (2008 p. 97).

m) *Game mechanics from an object-oriented programming perspective* by Miguel Sicart (2008). Object-oriented programming consists of several elements such as variables, conditionals, functions and methods. Each of these elements has a role, a syntax. Miguel Sicart's contribution consists of identifying that game mechanics, the actions that players enact while playing games, represent methods in object-oriented programming. Sicart defines videogame mechanics as methods invoked by agents interacting in the game world. By being aware of this fact, that game mechanics

represent methods in programming, designers and developers could think in simpler ways of translating their ideas around games and specifically for mechanics into code.

n) *Formal and dramatic elements of games and the "playcentric" approach* by Tracy Fullerton (2008). In her book *Game Design Workshop*, Fullerton envisions games as dynamic systems composited of both formal elements and dramatic elements. The formal elements are ingredients generally identifiable in most games, such as rules, objectives, procedures and outcomes. The dramatic elements are just occasionally and variably present and their purpose is to add singularity to the game; these elements are the story, the premise and the character. From Fullerton's view, the designer has to have the player as main focus of the design process, which constitutes the "play-centric" approach. The designer has to work with and structure the formal and the dramatic elements while always considering players as the main and final users of the game. Fullerton suggests to the designer to conduct playtesting, focus groups and questionnaires to get feedback from players and to make sure their expectations are fulfilled. However, it is up to the designer's intuition and skills to know and decide how to use the formal and dramatic elements of games to come up with a game.

o) *Brainstorming toolbox* by David Perry (2009). In the book *David Perry on Game Design: A Brainstorming Toolbox,* the author shows "how-to's" for different game design purposes: how to fun, how to business, how to pitching, how to stories, how to characters, etc. The particularity of this book is that it consists of hundreds of lists with many items from which the reader can choose in order to find an idea or solution to a problem. If looking for verbs or mechanics for a player to undertake in the game, or if what is needed is a comic hero, or a kind of weapon, or personality traits for a game character, etc… the reader can always turn to these long inventories and choose from there the item that suits best the occasion.

p) *Machinations* by Joris Dormans (2012). This is a grammar of diagrams to visualize feedback structures and the flow and progression of resources in a game, whether tangible or abstract. It consists of simplified versions of the graphics used in programming modeling languages like petri nets. *Machinations* suits very well the visual structuring of gameplay heavily based on economies to visualize the different possibilities of flow of resources afforded by rules and mechanics. In the following illustration, Joris Dormans, creator of *Machinations*, presents the machinations diagram for *Settlers of Catan* (Teuber, 1995). With the diagram he shows how resources flow within the game and finds 3 main feedback loops: one that is based on production through the investment of roads, villages and cities; a second one based on buying cards, and the third one based on trading with other players. In the diagram, the arrows show alternatives for the flow of chips, the triangles signal the moments for trading and the dice symbols and the double-token symbols indicate where luck and where multi-player action come into action, respectively.
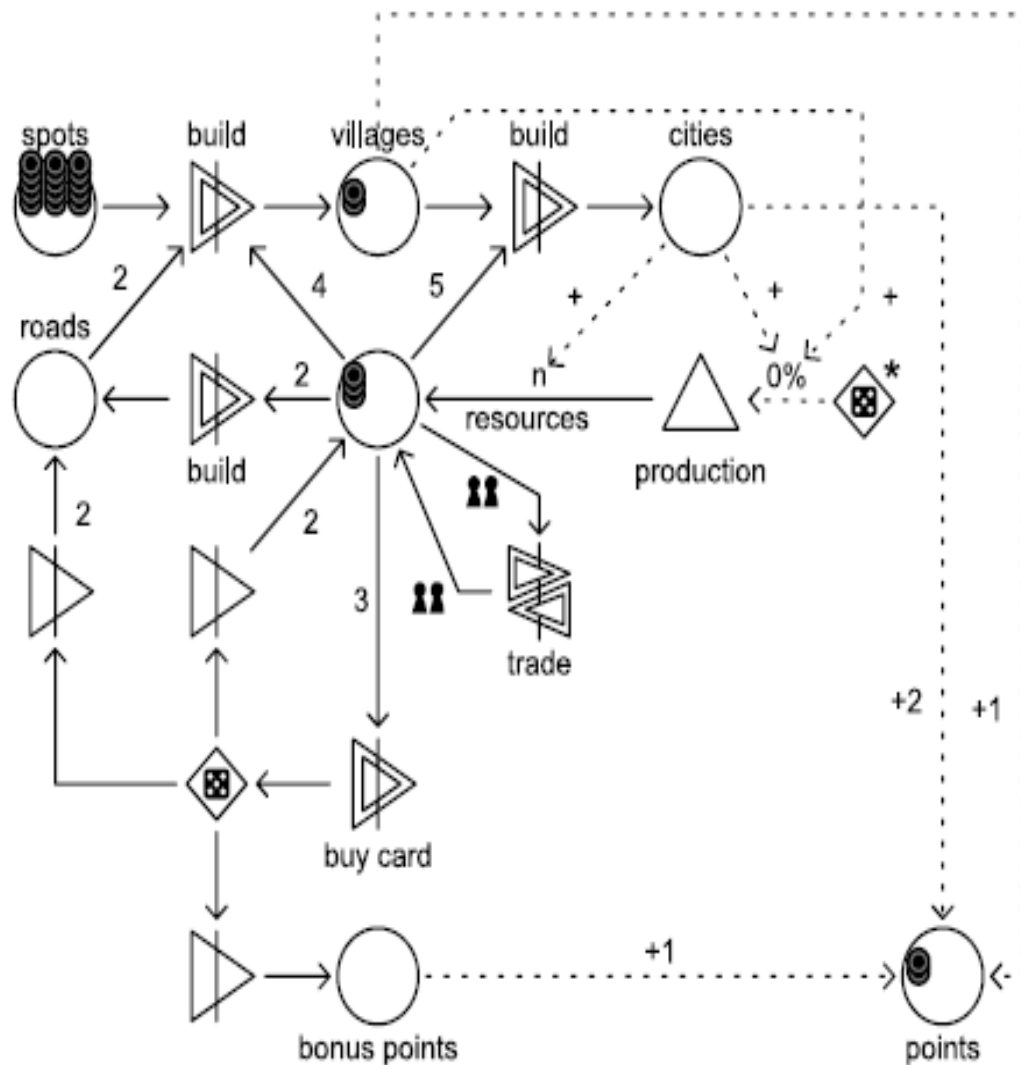
Illustration 3.13. Machinations diagram of Settlers of Catan (Teuber, 1995) presented by Dorman (2012 p. 91)

Besides the aforementioned contributions, many industry veterans have released over the last years their books on game design conveying what their experience working in the game industry has taught them. These books present anecdotes (Crawford, 1982), recommendations and visions on how the design of games is undertaken (Rouse III, 2001) (Pedersen, 2003) (Bates, 2004), (Rollins, et al., 2004) (Oxland, 2004), definitions around the elements of games (Koster, 2005), or subtopics of game design such as level and character design (Rogers, 2010). Some of these texts complement their philosophies around game design and afford practical applicability by explaining how to use matrixes, diagrams, charts and tables to externalize design thoughts and adjust and improve the design of a game (see Illustration 3.14 and 3.15).

ID	Token + Inherent Properties		STRONG	EDIBLE	POWERFUL	SOLID	WEAK	HUNGRY	HOME
1		Strong	X	X	X	B	X	C	X
2		Weak Edible	X	X	X	B	X	E	X
3		Edible	X	X	X	X	X	D	X
4		Edible Powerful	X	X	X	X	X	F	
5		Hungry	C	D	A	B	E	X	B
6			X	X	X	X	X	X	X
7		Solid	X	X	X	X	X	B	X
8		Solid Home	X	X	X	X	X	B	X
9			X	X	X	B	X	X	G

Illustration 3.14. Matrix of tokens and properties on the game *Pac-Man* (1980).
In this matrix Rollins and Morris present each of the tokens identified in the game Pac-Man: the ghosts, the fruits or power-ups, the pills Pac-Man eats, the timer and the square where Pac-Man's levels start. All the elements are depicted based on the properties edible, strong, powerful, solid, weak, hungry and home. The crossing of properties and tokens allows designers to visualize and balance the different elements of the game (2004 p. 508).

Color map: Green (trees), brown (trees/rock), purples (tombstones)
Enemies: Skeleton (basic), sword skeleton (red), skeleton (axe), ghost, zombie (basic), wooden coffin, chest mimic

Mechanics: Holy ground, breakable tombstone, breakable torch, breakable crypt lid, breakable rocks, Achille key statue, key lock, opening gate (door), opening gate (cave), prize wheel, treasure chest, locked chest, hidden chest, end plinth
Hazards: Unholy ground, Achille statue, fall-away ground, skull tower, breakaway bridge, deep water, lava pit

Color map: Red (lava), brown (trees/rock), purples (tombstones)
Enemies: Skeleton (basic), skeleton (axe), sword skeleton (red), sword skeleton (blue), skeleton (guardian), zombie (basic), raven, ghost

Mechanics: Holy ground, breakable tombstone, breakable torch, breakable crypt lid, key statue, key lock, opening gate (door), enemy coffin, floating platform, prize wheel, treasure chest, locked chest, hidden chest, end plinth
Hazards: Unholy ground, swinging gate, skull tower, flame jet, lava pit

Illustration 3.15. This table is called beat map. The left column describes variables and characteristics of the first level of the game *Maximo: Ghosts to Glory* (2001). The column to the right shows variables and characteristics for the second level of the same game. By having these columns and spotting the differences for each, the designer can design the progression of levels as well as analyze how from one level to another the game changes (Rogers, 2010 pág. 78).

GAME DESIGN FOR THE DESIGN OF INDEPENDENT GAMES

In this section I will survey game studies literature to find out how the design of independent games or the so-called indie games is addressed by experts on the field. The objective of this section is to grasp how the knowledge for the design of games within game studies is intended to be passed on to independent designers of games; to find out if the notions for the design of games from game studies are supposed to be applied by the so-called indie designers in the same way as designers immersed in the structures and logics of the industry are advised to do.

The indie games movement has varied in relevance throughout the years, reason why game design literature differs in its attention and awareness regarding the independent design of games. As discussed in a previous chapter, indie games as a cultural phenomenon was already identifiable at the beginning of the decade of 2000's, but lacked popularity within game cultures. The indie games movement got momentum during the last years of the decade of the 2000s', when *Braid* (Blow, 2008), *Super Meat Boy* (Team Meat, 2010) and other games made outside of videogame industry-premises got recognition from game developers and became favorites of many players.

Moreover, books and contributions dealing with the design of games have been appearing over the last three decades. During this time the industry has also evolved and the visions and philosophies from academics and industry designers have reflected the game industry's shifts in the formulation of concepts. This is why the literature has changed showing a progression regarding the industry and its surrounding circumstances. The early literature portrayed game design as a situation established within the logics and structures of the game industry. But authors of latter contributions realized game design could be also for people with interest in the design of games that maybe due to market and professional circumstances could not land a job in a game company. While other authors of posterior texts decided to affiliate their content and ideology to the people with affinity with the indie games movement.

Richard Rouse's (2001) pioneering text *Game Design Theory and Practice*, offers a vision around the design of games inherent to the videogame industry. However, in this text the beginnings of the phenomenon nowadays defined as the indie games movement start to show. Rouse presents interviews with legendary designers Steve Meretzky and Chris Crawford, who advocate for more creativity, freedom and decision power for designers at game development companies. Moreover, Chris Crawford talks about what it is like for him being an independent games developer, making games without being employed by a company, as well as about his effort putting together an informal meeting for designers outside the industry context, an event that would later evolve and become what nowadays is the *Game Developers Conference*.

A few years after Rouse put out his book, Andrew Rollins and Dave Morris (2004) published *Game Architecture and Design: A New Edition*. The peculiarity of this text is that it digs into a new working model for the development of games that was blossoming in the industry: a satellite-scheme. Rollins and Morris explain this model as new dynamics between major games corporations requesting services from small and independent studios with the aim of manufacturing separately and through different intermediaries the different parts of a large game production. This business model referred to by Rollins and Morris coincides with the change of structures of the game industry that Paolo Ruffino identifies as the cause behind the indie games movement (Ruffino, 2013), which has been discussed in the precious chapter of this dissertation.

By the same time period Rollins and Morris released their work, Bob Bates presented his *Game Design* (2004). In this text, Bates envisions independent development similarly to what the indie games movement represents nowadays. Bates depicts independent development as an alternative way of making games characterized by small teams that self-fund their project outputting small productions and distributing and publishing their work on non-traditional digital platforms. Bates points out that this model allows developers to have complete control over their work; but at the same time presents challenges regarding the extra work to be done for the marketing of the game and for reaching out big audiences.

Other books presenting a view around independent design and development based on the business model of the industry are Penny Sweetser's (2008) *Emergency in Games* and David Perry's (2009) *David Perry on Game Design: A Brainstorming Toolbox.* Sweetser (2008) presents an interview with *Sony's* former senior R&D Craig Reynolds. There, Reynolds explains that multimillion dollar projects like the ones the industry deals with do not favor experimentation due to size and cost; reason why sequels and mashups of previous successes kept being produced. Reynolds sees independent productions as potential ways for innovation and exploration. Perry (2009) mentions that independent designers or small development studios have to work to get their games funded and distributed by a larger publisher; a view that do not longer match current models for publishing and distributing games.

Among the books released during the heyday of the industry and before the rise of the indie games movement, Tracy Fullerton's *Game Design Workshop* (2008) is one of the texts on game design that touches upon the topic indie games the most. On the one hand, Fullerton mentions that her vision on the design of games was obtained through years of teaching game design, time during which she had as students the indie designers that developed *flOw* (Chen, et al., 2006) and that later on formed *Thatgamecompany*.

On the other hand, Fullerton includes a small section totally addressed to "indies". In this section Fullerton suggests to these designers to support their practice by promoting their work on their own website, making their work visible on user-generated websites like *Kongregate.com* or *Newsgrounds.com*, trying to reach bigger markets through game publishers and having their game available for digital download for consoles. Moreover, Fullerton (2008) identifies "indies" as participating in game jams and working with web-based tools like *Macromedia Flash*. And when digging into the topic of game production, Fullerton (2008) acknowledges that this represents an arduous process for indie teams and oftentimes a struggle due to financial reasons. Besides these particularities dealing with technology and business, Fullerton does not differentiate the applicability of her theories for industry designers and for indie designers.

Another book briefly addressing the design of indie and independent games is Brenda Romero's and Ian Schreiber's *Challenges for Game Designers* (Brathwaite, et al., 2009). In this text with resources and exercises to learn game design, Romero and Schreiber refer to independent development as an alternative to gain experience in games for a posterior work insertion in a game company. The exercises and theories Romero and Schreiber present, however, aim at being useful for the learning of game design for any individual interested in making games independently of expertise, background or position in the game industry or outside the industry.

The momentum that indie games obtained in the last years paved the way to the appearance of game design texts authored by members of the indie games movement. Designer and activist Anna Anthropy co-authored with designer and scholar Naomi Clark the book *A Game Design Vocabulary* (2014). In this book, Anthropy and Clark take a similar approach to game

design as other authors. Anthropy and Clark identify a set of elements in games and the way such elements interact with each other and present them as a vocabulary that game design-interested people are advised to learn. Anthropy's and Clark's innovative take, however, lies in the exemplification of their vocabulary through works of the indie games movement. They explain how each concept they presented is visible in well-known indie games such as *Papers Please* (Pope, 2013), *Spelunky* (Yu, 2008), *Crypt of the Necrodancer* (Brace Yourself Games, 2015) and *Gone Home* (Gaynor, 2013), among others.

Another book of indie spirit is Tynan Sylverster's *Designing Games. A Guide to Engineering Experiences* (2013). Sylvester expertise covers game projects of different sizes, small ones and big ones, outside and in the industry, including a participation in *Bioshock Infinite* (2013). In his effort, Sylvester tackles the nature of games and their making process, from both a theoretical and practical perspective. He draws concepts from psychology and mathematics, for instance, to explain situations designers deal with while making games, as well as he provides numerous methods, like diagrams, tables and charts that help the reader visualize the design work. Conversely to other well-known game design texts within academia and the industry, Sylvester does not address the reader specifically as a person that wants to make a career within the industry. His view is, as an indie himself, more inclusive; in the sense that he presents game design as something anyone with interest in games can undertake.

As seen through this survey of game design, the concepts of independent development, independent design and indie games are portrayed by the literature as situations based on a different business, production and financial model than the model around which the industry revolves. From a content perspective, there are no different prescriptions from academics and industry designers in the design of games by an independent designer and for the design of games within the industry. This implies that the notions and foundations of game studies for the design of games are seen as applicable for any context of design, either independent or within the industry.

NOTES ON THE NATURE OF GAME DESIGN

The foundations of game design have been laid in the previous sections of this chapter. Based on them, I would like to present the following remarks about the nature of game design.

The knowledge in game studies for the design of games is characterized by formalizations, models, visions and philosophies by both academics and industry people. The discipline has granted the same value and attention to works resulting from scientific practices as well as to contributions based on empirical observations and insights generated in the context of the industry. Academic contributions as well as anecdotic views and industry philosophies are seen equally as the principles of game design.

Game design constitutes interpretations and conceptualizations of what the design of simulations, interactive systems and playful media has represented for game design authors. The visions revolving around the design of games within game studies have been developed under the own terms and from the very own perspectives of their authors. Yet, beyond this particular stance of the discipline, there are not epistemological foundations in game studies dealing with what design implies[21], with the intuitive actions an individual undertakes when designing, such as working with constraints, identifying and formulating the problem to solve,

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[21] The elements of design are exposed in the next chapter on design theory.

among other activities. Just recently, a few papers have turned to design research[22] to conciliate concepts. But up to now, game studies has not turned to other disciplines that could contribute to reach a better and necessary understanding on what people do when dealing with constraints, when generating and imposing meaning through interactions, while constructing artifacts or devising mental structures.

Game design is a phenomenon originated in the game industry and that mostly revolves around it. From a game design perspective, the design of a game is embedded within an industrial process; it consists of the single and initial stage of the development of a game, and once this stage is over the production stages start with no further place for a design work due to technological and financial reasons. As well, this design is based on the industry's economy, which implies the creation of a game is dependent on the market and on the parties investing on the production of the game. This means the game idea and many of the design details of the game are determined by many other factors than the decisions of the designer.

Game design is both descriptive and prescriptive[23]. It is descriptive since industry veterans depict how the design of games is done in the industry according to their experience. Game design is prescriptive since many contributions aim at recommending how the design of a game can be optimally conducted for best results, for a better game. Such a duality entails game design partly should reflect and represent what the design of a game actually is like, while part of it for being idealistic or theoretical can be instead just an approximation to the phenomenon of designing games.

Game design is an industry-influenced construct. Early texts address their readers as people aiming at working in the industry (Costikyan, 2002) (Crawford, 1982) (Oxland, 2004) (Rouse III, 2001) (Rollins, et al., 2004); as time went on texts presented more inclusivity towards people that could not land a job in the industry and that could make games on their own (Fullerton, 2008) (Brathwaite, et al., 2009). But yet, game design is still formulated from the stance of the industry. Game design does not deal with how humans can intuitively make games, it does not revolve around the understanding of game making as an activity humans have been doing for millennia[24]. The design of games in game studies is formalized based on how this practice has been outputting best results in the industry. This does not mean that the knowledge from game studies for the design of games is not useful, though. Game design can provide useful guidelines to persons with the intention of designing a game in any context, as literature has shown.

As an industry-based conception, game design concentrates in game forms that pertain the industry the most or that are similar the most to the products produced by the industry: videogames. The survey of literature undertaken for the writing of this chapter showed that the majority of the literature within game studies for the design of games deals with videogames and in some cases also with board games, as tools to prototype videogames and to learn about game design. Other forms of games stepping outside the borderlines of the industry standards and the design implications these game forms pose, are not depicted in

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[22] These papers are for example (Kultima, 2015) (Kuittinen, et al., 2009) (Lankoski, et al., 2017). These texts, however, deal with concepts and visions that fall short to explain how design is undertaken; i.e. *reflection-in action* (Schön, 1983) or seeing the acts of designing (Lawson, et al., 2009) as equivalent to game design activities and stages. These issues will be tackled and explained in the next chapter on theories of design.

[23] In the next chapter revolving around theories of design I explain differences between descriptive and prescriptive design models according to Evbuomwan, Sivaloganathan and Jebb (1996).

[24] As I already mentioned in the previous chapter about the indie games movement, games have been around for millennia. Examples are the games *Senet* and the *Royal Game of Ur* found in Egypt and Iran, respectively, dating from a time between 3.000 and 2,400 B.C. (Flanagan, 2006).

game design. This leaves out of game design such game forms as playful and freeform activities or mind games that, as suggested in the previous chapter, could likely be designs produced within the indie games movement.

GROUDING THE CONTRIBUTION OF THIS DISSERTATION WITHIN GAME DESIGN

Numerous game design contributions and efforts have appeared over the last decades. Yet, as pointed out by Katherine Neil (2012), there is not much knowledge on how these works support designers in their practice. Research to evaluate the impact of game design in the practical field of the designers is necessary. This dissertation fills this gap. It explores how the so-called indie designers undertake the design of games. Through its results, this dissertation will be able to inform if there are elements and visions of game design being applied by indie designers in their field of practice so that this knowledge can help with the improvement and validation of game design theories, models and principles. Furthermore, since game design is not articulated around concepts of design similar to those from design theory, this dissertation will contribute presenting a study based on design concepts that can provide a new panorama of what game design constitutes and what the design of games outside of the industry implies.

Game design entails compositing and working with the constituents of games such as rules, goals and metaphors (Järvinen, 2008) (Schell, 2008)(Salen, et al., 2004) (Oaxland, 2004) (Rogers, 2010) (Rouse, 2001) (Brathwaite, et al., 2009) (Rollins, et al., 2004). However, game design contributions do not specify how to do that compositing work and leave this to the intuition, imagination and skills of the designers (Järvinen, 2008). Moreover, some games lack goals, rules or are not metaphor-based, such as a few mentioned in the previous chapter about the indie games movement[25]. In this scenario, the principles of game design are challenged by a new rising paradigm that independent games represent. This dissertation also contributes with the understanding of this issue, by finding out what are those elements of design that the so-called indie designers of games undertake that may represent a change in paradigm in what the designing of a game entails in comparison with game design.

Game design addresses the design of games in the industry and the design of games by independent designers as a single subject. However, there are basic differences from one context to another with big implications on what it comes to design, for instance, the nature of constraints. Constraints[26] are one of the most basic elements the designer works with and that have a huge impact on the final result of the design work (Lawson, 2005). Game design, which revolves around the industry, will be based on different constraints and specifications than those constraints that a designer working independently will face. As well, since game design portrays the design of games within a development pipeline, where many people interact and contribute, the design it entails is not the same as the design undertaken by a person who works alone and without interference of other participants. This dissertation will also try to explain how these discrepancies between game design and the design undertaken by the so-called indie designers work.

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[25] E.g. Proteus (Key, et al., 2013) and mind games.
[26] The definition of constraints is presented in the next chapter about design theories.

CONCLUSION

Game design is a focus of game studies aiming at defining the principles and units of the design of analog and digital games. Game design pictures the design of games as an activity done by a *game designer* and consisting of compositing rules, goals, actions for the player to perform, and also of providing quests, rewards and feedback. The game is always advised to be designed with focus on the players, to meet their expectations and make sure that they understand what the game is about, they are able to play it and have a pleasant experience.

Game design is conceived, formulated and embedded within the game industry. Within this conception, there is a user in the form of a player that is strongly specified by demographics and market specifications. As well, there is also a publisher, an investor or a game producer working in the form of a client providing the guidelines and specifications of what the game should be.

Game design is stage-based; it is organized and structured in phases within an industrial process. It is the first stage of the development process of the game, and once done, the production of the game starts. The design of the game comprises the tasks of conceptualization, playtesting, prototyping and documenting of the game; this entails shaping the design idea, trying it out and making sure the game concept is solid. With the completion of these tasks, the work on the game is handed over to other people to do the programming, the art, and other detailing work. During the production of the game, designers shift their role from being creative to being supervisors of the project.

This chapter presented a brief history of game design in four phases. The first phase of game design started with the creation of the first prominent videogames in academic-related contexts, where no formal understanding of the design of videogames existed. The second phase started around the peak of electronic toys and arcade game machines, time period during which a few efforts to explain the design of games and simulations appeared. The third phase started with the emergence of the videogames industry; and it was during this period when the majority of texts and contributions formalizing game design loomed. The last phase of game design history happened when the structures of the industry shifted and facilitated the prominence and success of independent games.

Game design is one of the several important research areas within game studies, and similarly to other focuses, the knowledge around the design of games has been developed from the perspectives and with the own methods of the people participating in the discipline. And even though there have been recent efforts to conciliate and bridge game studies with theories and concepts from design research, the understanding of the activities and actions people undertake as part of designing a game is incipient within game studies. Moreover, there is a lack of knowledge within game studies on how designers undertake design so that this can inform the discipline about the success of its theories and models and their practical applicability.

Over the last decades, many contributions revolving around the design of games have been proposed. Some of these very popular works are the *MDA framework* (Hunicke, et al., 2004), the game design patterns (Björk, et al., 2004), the *game design ontology project* (Zagal, et al., 2005), well-known books such as the *Game Design Workshop* (Fullerton, 2008) and *Rules of Play* (Zimmerman, et al., 2007), as well as the anecdotes, views and proposed methodologies of industry veterans such as Chris Crawford's *The Art of Computer Games* (1982) and Raph Koster's A *Theory of Fun for Game Design* (2005).

These contributions have been classified as vocabularies, patterns, frameworks, rules, guidelines, tools and methods within the discipline. These contributions can be used for analyzing games and getting insights broadening the designer's perspectives on the nature of games. They work as inspiration and guiding principles for the design of games; designers have to follow their inspiration, imagination and skills to know how to employ such concepts while designing.

Some game design contributions consist of diagrams that facilitate designers working out and improving their designs by visualizing and tracking the flow of game elements and resources. As well, several game design books present a series of resources such as tables, matrixes, charts and diagrams that help designers externalize their design thoughts and balance their game.

Game design literature addresses the design of games outside the industry, especially those affiliated to the indie games movement, as based on a different business, financial and production model. But beyond these distinctions, no special considerations in terms of design are advised for the design of these games. It is there where this dissertation comes in, in identifying what are the similarities and discrepancies between game design and the design undertaken by the so-called indie designers, so that this knowledge can inform game studies to improve the existing game design foundations.

CHAPTER 4: LENSES FOR THE STUDY OF THE DESIGN OF GAMES

This chapter presents the theoretical framework to be used as a means to answer the research questions of this dissertation: if, based on the design undertaken by the designers of the so-called indie games, the design of indie games constitutes or not a different paradigm compared to game design. On the following pages, the theories constituting the themes for the study of the design undertaken by the designers of the so-called indie games and the comparative analysis between the design of indie games and game design will be explained.

The discipline of design, and specifically the schools of thought of design research and design theory, have been selected as the main theoretical standpoints of this dissertation for two reasons. First, because designing games entails undertaking a form design. Therefore, both game design[27] and the so-called "indie" design of games can be subjects of study of design as a discipline. And second, while game studies[28] lacks epistemological views on the nature of design and on what designing implies, design research and design theory do explain design thoroughly. Theories from design research and design theory depict what a designer does while designing, what kind of matters designers deal with while doing design, and what is the whole design process like; notions that represent the core of this dissertation.

The structure of this chapter is as follows: first, design research, the concept of design and the two popular paradigms from which design is analyzed in some disciplines will be introduced. Next, all the concepts to use as lenses to examine the design of games will be explained individually and thoroughly. Once all the theories and terms of design have been introduced and exemplified, the similarities between design and art will be discussed to be able to find out whether the design of indie games and game design are more alike design or artistic practices. The chapter will close by summarizing all the concepts and theories of design hereby discussed.

The theoretical concepts to cover in this chapter are:
1. Types of problems designers deal with;
2. elements configuring design problems;
3. approaches for design;
4. *C-K Theory* (Hatchuel, et al., 2003);
5. design guiding principles or design style; and
6. design methods[29].

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[27] As already explained in the introduction and in the second chapter of this dissertation, the term game design is used to refer to the series of principles, models and theoretical formulations within game studies dealing with the design of games from the established game industry's perspective. Hence, game design and the design of games are distinct concepts.

[28] A thorough review on literature dealing with game design was undertaken for this dissertation. As presented in the previous chapter, most game design texts focus on breaking down and formalizing the elements of games. As well, the majority of game design contributions consists of models that aid the designer in the understanding of what games are, but do not explain the designing of games as a phenomenon. Instead, game design presents the design of games as a construct revolving around the game industry and its processes and logics. For the same reason, game design is described and prescribed as a cycle within the game development pipeline.

[29] Bryan Lawson's and Kees Dorst's (2009) model on design activities consisting of *formulating*, *representing*, *moving*, *evaluating* and *managing* and Kees Dorst's (Dorst, 2011) (Dorst, 2015) patterns of thinking for design were also studied as part of this dissertation. However, these two contributions were discarded. It was considered that *C-K theory* (Hatchuel, et al., 2003) and the two approaches for design, *problem-solving* (Simon, 1996) and *framing* (Dorst, 2015), provided the same insights about the activities designers undertake while designing and in a more fitting way with the purposes of the dissertation.

The first two items of the list, the types of problems designers deal with and the elements configuring design problems, will revolve around the matters designers deal with while designing and the factors determining those matters. The third item refers to the approaches of the designers while doing design, *problem-solving* (Simon, 1996) and *framing* (Dorst, 2015). The fourth item, *C-K theory* (Hatchuel, et al., 2003), will allow understanding how the designers come up with their design and the logical processes behind it. With this theoretical standpoint it will be possible to reach an understanding about the design of games in general. As well, it will be possible to identify the moments at which indie designers recognize what the design of their games is about.

The fifth item, design style and guiding principles, are concepts referring to regular and common design actions among designers that shape their design identity. This notion will help define the main characteristics of the design of indie games. The last item, design methods, refers to structured design activities and formalized design actions pertaining to a design practice. This item is important to envision if the designer of indie games follows also popular design traditions, and especially, find out if they undertake structured or semi-structured design routines that are also common in non-indie design contexts.

STEPPING INTO THE REALM OF DESIGN AS FIELD OF INQUIRY

Before digging into the theories of design, it is important to have a clear picture of the context from which these theories arise. In this subsection, design research will be introduced and some distinctions between this and other similar concepts will be clarified. Then, the term design will be defined, followed by an explanation about two common programs from which design is studied in some schools of thought, commonly referred as Herbert Simon's *problem-solving* (Simon, 1996) and Donald Schön's *reflection-in-action* (Schön, 1983).

Design research, or design theory, deals with concepts of design and their utility, validity, coherence and functions (Love, 2000). Design research is concerned with the development, formulation and dissemination of knowledge about design; it revolves around the actors of design, such as designers and users, the design processes and the elements involved, such as forms and materials, as well as the final result of undertaking design (Cross, 1999). Subjects of enquiry of design research are, for instance, how people design, studies of empirical nature on the behavior of the designers, as well as theoretical discussions on the nature of designing and how people learn to design (Cross, 1999).

Design research is, on the one hand, a sub discipline of philosophy of design. Philosophy of design is epistemologically equivalent to the philosophy of science or philosophy of technology, and it is specifically concerned with such questions as what is design and what are the characteristics of a valid theory of design, among others philosophical inquiries (Love, 2000). On the other hand, design research also has several sub disciplines[30] or areas of study,

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[30] Research through design is a term that has permeated game studies. For instance, it is mention as a method of scientific inquiry about design in Aki Järvinen's *Games without Frontiers* (2005) as well as in the recent publication *Game Design Research* (Lankoski, et al., 2017). However, research through design is not a sub discipline of design research. Research through design is a relatively recent approach from the field of Human Computer Interaction about obtaining knowledge through the undertaking of design, the making of prototypes and the development of final and formal designs with the purpose of formulating new theories about designing (Zimmerman, et al., 2007). This concept is based on a paper by Christopher Frayling's (1993/4) in which the author advocates for exploring concepts and theories through the development of art and design. In his text, Frayling introduces the concept

that are design science, science of design, design methods and design methodology (Cross, 1999)(Cross, 2001)(Love, 2000).

Design science and science of design are not the same. The former is a rational and systematized approach towards design where technological and scientific knowledge from different disciplines converge for the devise of developments, such as in engineering fields where advanced technical knowledge is implemented to produce innovative and sophisticated solutions (Cross, 2001). The latter refers to the systematic study of design, its principles, practices and procedures, following scientific methods of enquiry, just as other disciplines conduct research on their subjects of study (Cross, 2001). Design methods as sub discipline of design focuses on the "how to" to doing design (Cross, 2001)(Love, 2000); while design methodology is interested in design procedures in a factual way, in how design is actually procedurally and structurally undertaken with the intention of prescribing sequenced stages leading to better design results (Kroes, 2002).

The forging of design as field of study can be traced back to the 1920s to a series of different events and circumstances: the search for scientifically designed products, Theo van Doesburg's magazine *De Stejl* raising awareness on the rise of a trend systematizing art, science and technology, and the search of new patterns in architecture by Le Corbusier (Cross, 2001). After World War II, technological impetus and competition among nations, with such developments as the launch of the Sputnik satellite and the rise of computer programs, led the way to the proposing of new creative methods that could boost technology (Cross, 2001). As a result, the first relevant implementable development methods appeared along with the first books and events about design methods[31] (Cross, 2001) (Cross, 2007).

In September 1962 the *Conference of Design Methods* took place in London launching design methodology as a field of inquiry (Cross, 2001)(Cross, 1993). Later on, after a period of little interest in the formalized study of design in the 1970s, the conference *Design:Science:Method* of the Design Research Society in 1980 opened the door to the study of new design applications in the fields of engineering and product design (Cross, 2001). It was in the 1980s when the establishment of design as a discipline with its very own principles occurred (Cross, Nigel, 1980) and when the first scientific design journals appeared (Cross, 2001). Having provided an introduction to design as a discipline, it is time to define its focus: design as an activity.

DESIGN AS HUMAN ACTIVITY: DEFINITIONS

Design is an activity that pertains to all humans and not exclusively for those individuals referred as designers. In an individual sphere, people arrange their living and working spaces, plan their activities and even shape their professional careers; people design their lives. In a more collective or social level, people configure business models, come up with marketing strategies and create laws (Lawson, 2005) (Rittel, 1987). All these, are activities that imply undertaking design.

Klaus Krippendorff sees design as making sense of things through forms and meanings (Krippendorff, 1989). For Herbert Simon, design is concerned with devising artifacts to attain

"research through art and design" and differentiates it from the concepts "research for art and design" and "research in art and design".

[31] Design methods will be explained on subsequent pages of this chapter, but not as a sub discipline of design but rather as procedural design activities aiding the designer's work.

goals (Simon, 1996). For Kees Dorst, design can be seen as the reasoning followed to work with a set of needs, requirements and intentions in order to deliver a new bit of reality that features a physical structure and an intended use (Dorst, 2004). For Bryan Lawson (2005), design is both a product and the process to create such a product.

Armand Hatchuel and Benoit Weil define design as follows:

> "reasoning activity which starts with a concept (an undecidable proposition regarding existing knowledge) about a partially unknown object x and attempts to expand it into other concepts and/or new knowledge. Among the knowledge generated by this expansion, certain new propositions can be selected as new definitions (designs) of x and/or of new objects" (Hatchuel, et al., 2009 p. 185).

Armand Hatchuel (2002) (2018) grounds his definition of design around the new knowledge that the creation of an object provides to its creator and user, and to the new possibilities this newly devised artifact or concept has in the world. To design is to create a "thing" that is not totally part of the current knowledge of the designer nor of the knowledge of the person for whom the design is indented for (Hatchuel, 2018). Hatchuel sees design as an expansion of concepts and knowledge, and as an expansion of reality. Moreover, Hatchuel (2018) notes some peculiarities about designs:

- Before the design starts, the designed objects are unknown, otherwise they would not be designs but rather copies of something else;
- designs are not obtained through deduction, induction or abduction; otherwise designing would be a matter of just following these reasoning patterns;
- designs are not about discovering pre-existing phenomena, otherwise design would be limited to science and observation;
- designs are expected to afford functions and properties formulated prior to the design process; otherwise design would just consist of random idea emergence.

According to Gregory (1966) and Lawson (2005), design is always the same creative process, reason why the actions designers undertake for design are always the same independently of the field of application or discipline. No matter if it is architecture, product design, graphic design or the design of games, designers always commit to the same underlying actions while doing design (Lawson, 2005). As seen by Bryan Lawson, what differentiates designers in their respective fields of work is the matters dealt with, the constraints that define and shape the designs as well as the materials and procedures for each field (Lawson, 2005).

COMMON PARADIGMS FOR THE STUDY OF DESIGN

Within some schools of thought of design research, two visions have influenced the way design has been studied; they are Herbert Simon's *problem-solving* (Simon, 1996) (Simon, et al., 1972) (Simon, 1973) and Donald Schön's *reflection-in-action* (Schön, 1983). Within game studies, Simon's and Schön's views have been discussed in a few texts (Salen, 2007)(Salen, et al., 2004) (Kuittinen, et al., 2009) (Kultima, 2015) (Kultima, et al., 2010). These two visions will be introduced in the next paragraphs because the theories upon which this chapter revolves around borrow a few elements from both perspectives.

PROBLEM-SOLVING

Problem-solving is the main concept upon which Herbert Simon shaped his theory of design "the science of the artificial" (Simon, 1996). It is based on theories from the second half of the XX century on how humans arrive at solutions to problems as well as on Simon's empirical research on digital computing programs (Simon, et al., 1972). For Simon, design is a rational search process seeking a satisficing[32] solution through a maze of possibilities; a maze that defines the environment. For such a process to succeed, or rather said, for a successful *problem-solving* to happen, a selective search has to be undertaken as well as a reduction of that maze of possibilities into manageable proportions (Simon, 1996).

According to Simon[33] (Simon, et al., 1972), *problem-solving* systems, such as computers, solve quests evoking specifications and rules, working out with given problem characteristics and retrieving information from memory until finding a solution. Examples of such processes are finding move sequences for the games of *Chess* or *Tower of Hanoi*, solving crypt-arithmetic puzzles or dealing with theorems. In the case of humans doing *problem-solving*, the operations are the same but simplified, limited on the capability to deal with large volumes of information and performing numerous computations. More specifically, when doing design under a *problem-solving* perspective, humans would try to find a solution or reach a goal dealing with convoluted scenarios full of variables with likely complex requirements to meet, and would reduce or chunk these scenarios to small or controllable situations where the information and resources at hand allow reaching a solution. These two states of scenarios, the convoluted situation with complex requirements to meet and the already-chunked and controllable situation, are what Simon calls ill-structured problem and well-defined problem, respectively (Simon, 1973).

An *ill-structured* problem is such whose structure lacks definition in some respect (Simon, 1973). While a *well-structured* problem is such that has been formulated in such a rational and specific way that can be given to a *problem-solving* entity (i.e. program, or individual) to reach a satisficing solution. This, under the conditions that the problem-solver has a description of the initial and solution state, counts with the operators for computing from one state of the problem to another, has the knowledge or information to choose which methods and operators to execute, and counts with the means to identify the difference between problem states (Simon, 1973).

An example to this description of a well-defined problem and how a problem-solver can find a solution is the solving of the *Tower of Hanoi* by a computer. The computer program would need to be provided of the initial state of the problem to solve that is, having the plates of the tower stacked from the smallest to the largest on one side of the structure of the game. The computer would also need to know what is the final state that represents a solution to the problem; this is the stacking of the plates from the smallest to the largest at the opposite side of the game. To solve the problem, the computer would also need to know all the valid ways in which the plates can be stacked and move from one pillar of the game to another. The computer would also need to run methods to validate the state in which the problem is at

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[32] Satisficing is a termed coined by Herbert Simon (Simon, et al., 1972) to imply that humans can only find satisfactory rather than optimal solutions to a problem due to their limited capabilities. For Simon's perspective, optimal solutions to problems are only achievable by computing systems.
[33] Most common terminology from a *problem-solving* perspective:
- Problem state: particular stage at which a problem solver has knowledge about a problem; also referred as state of knowledge or knowledge state (Simon, et al., 1972) (Chan, 1990).
- Problem space: the manner a subject represents a task in order to work on it (Simon, et al., 1972).
- Operators: various methods of modifying one state into another state (Chan, 1990).

every computation, so that the computer can determine if the problem is solved or not. With this information, the computer would be able to compute a solution to the *Tower of Hanoi,* a well-defined problem due to the specificity of its formulation.

From Simon's perspective, most real life regular problems are ill-structured problems until they are formalized and reduced to well-structured problems; until they are prepared to be handled by a problem solver (Simon, 1973) and a satisficing solution can be likely found or accomplished. In terms of the design of a game, a designer then would decompose progressively and hierarchically the different problems that designing a game represents. The designer would formalize all these problems as either ill-structured or well-structured problems (Simon, 1973). The designer then would chunk or reduce the ill-structured problems and search for a satisficing solution to the well-structured problems, so that these solutions also help transform the ill-structured problems into well-structured problems. The designer then would create a representation of the different scenarios the design of the project represents and would also evoke all kinds of requirements, specifications and other pertinent information and preconditions for the design during the process (Simon, 1973). By solving well-defined problems and reducing the not-yet solvable problems into solvable problems, she would be getting closer and closer to reaching the completion of a game (Simon, 1996).

REFLECTION-IN-ACTION

Besides Simon's *problem-solving*, *reflection-in-action* by Donald Schön is the other program commonly referred to within design. Donald Schön's book *The Reflective Practitioner* (1983) discusses how professionals deal with problems within their practice. For Schön, real-life problems are not fixed or model-based scenarios such as the ones presented in universities and in theoretical books. Schön claims that professionals deal with situations that in one way or another way go out of a rigid standard, and yet need to be given a solution.

The way practitioners engage with problems according to Schön is through a conversation (1983). Schön describes design as a conversation with a situation, among the several other professions he depicts as part of his thesis that imply exactly the same procedure. What professionals do, then, is to face the problem with accumulated knowledge from their practice. They select what elements within the situation to pay attention to and how to treat those elements. Then the professionals impose coherence to the context of their action and decide on the pertinent direction to go. While dealing with the situation, the practitioners look back into their repertoire of experiences and actions where their tacit knowledge lies; they talk back to themselves while acting (Schön, 1983).

The basis of Schön's concept of *reflection-in-action* (1983) is a series of internal "conversations" in which practitioners engage, independently if concerned or not with very detailed or abstract matters. Professionals engage consciously or unconsciously in a cycle in which they freely shift and move from exploration to commitment in face of the situation. They consider different paths of actions, they ponder the consequences to their decisions, make suggestions, try out alternatives, and work based on a "what if" assumption (Schön, 1983).

Reflection-in-action refers to the undertaking of the conversation by the professionals at the moment of dealing with the situation (Schön, 1983). This conversing or reflecting is done simultaneously at the time of doing an action, at the moment of practice; it represents a set of implicit knowledge, instincts and feelings coming into play while facing a situation as well as a

set of thoughts and internal talking about the situation. It is, for instance, the case of musicians while jamming, who, by knowing theoretical music principles and by evaluating the music performed at the moment, have the knowledge and the feeling on how to proceed and fit within their spur-of-the-moment music playing session (Schön, 1983).

The conversation that Schön (1983) depicts to be undertaken by professionals is not necessarily self-aware, induced and consciously externalized; on the contrary, it is internal, inconspicuous and spontaneous. An example is Schön's chapter dealing with design. Schön narrates how an architecture teacher helps a student with an assignment. The student shows her assignment sketches and claims not being able to come up with a good solution to a problem. The teacher's response is to draw lines over the student's sketch to restate the context upon which the student is working and at the same give her advice of different lines of actions. The teacher elicits his knowledge by telling the student what to do, but through this process he is not aware of having an internal conversation to provide a response to the student's inquiry.

CLARIFICATION ON BOTH PROGRAMS

As already mentioned, Herbert Simon's *problem-solving* (Simon, 1996) (Simon, et al., 1972) (Simon, 1973) and Donald Schön's *reflection-in-action* (Schön, 1983) are two visions grandly influencing the way design is viewed in some disciplines. However, many game design texts reduce their analysis around the design of a game to questioning if either the designer undertakes *problem-solving* or *reflection-in-action*. These texts do not grasp the extreme similarity that both programs represent.

Donald Schön (1983) talks about professionals applying the knowledge obtained through experience and engaging in a conversation to tackle a situation. Simon talks about the problem solver turning to rules and existing knowledge obtained through learning from solving previous problems, and turning to the use of intuition and other epistemological capacities to solve a problem (Simon, 1996). Moreover, just as Schön's view on reflection is totally subjective, Simon's view also features a high degree of subjectivity since the transformation from ill-structured to well-structured problems is defined by the problem solver (Dorst, 2006). What is more, both Simon and Schön talk about the "frame" by the designer (Simon, 1996) (Schön, 1983), an element that none of these theorists define explicitly but refers to the reconfiguration of the situation from the designer's perspective.

The difference between these two programs is that they prime to more or less extent attention to different notions. As design theorist Kees Dorst explains (2004)(2015), Simon's program represents a positivistic framework that focuses on the problem to be solved and the search the problem solver undertakes as part of that activity; while Schön's program is a constructivist framework focusing on the role of the practitioner rather than on the situation that has be tackled. Thus, for Dorst, *problem-solving* (Simon, 1996) (Simon, et al., 1972) (Simon, 1973) and *reflection-in-action* (Schön, 1983) have a complementary role (Dorst, 2015). However, despite their popularity within some disciplines including game studies, these two programs still need further clarification to fit within the study of design. And as it will be explained regarding *reflection-in-action* (Schön, 1983), this concept does not suffice to reach an understanding about design.

Designing consists of expanding the existing reality with new knowledge (Hatchuel, 2002). A design represents an expansion of the world (Lawson, 2005) (Hatchuel, et al., 2003) (Hatchuel, 2018); a design is a new bit of reality in the form of a physical structure (Dorst, 2004). *Problem-*

solving can represent a good fit to find a solution to a problem (Simon, 1996) (Simon, et al., 1972) (Simon, 1973). But if *problem-solving* does not involve creating something, *problem-solving* is then just finding a solution to an equation, finding a solution to a conflicting issue, but not actually designing (Hatchuel, 2018). In other words, not all problems are design problems and not every *problem-solving* approach leads to design.

As for Schön's *reflection-in-action* (1983), it is a concept explaining an act within the practice of professionals. Since design is a professional activity with the characteristics depicted by Schön, design also entails *reflection-in-action*. However, Schön describes in his text five professions engaged with reflectioning while doing: engineering, architecture, management, psychotherapy and town planning. Health professionals such as the psychotherapist also turn to *reflection-in-action,* as Schön depicts, to provide a diagnosis. And even if a diagnosis could be considered under certain perspectives as design, not all professions imply undertaking design. But yet, from Schön's perspective, all the professions entail reflection while doing, *reflection-in-action*.

An example can be a person sorting out garbage at a recycling facility. In Schön's terms, this person would turn to her knowledge and repertoire of previous experiences to decide how to sort out garbage; this is because the different materials that composite nowadays' commodities oftentimes make very difficult the sorting of disposables. This person would need to engage in a discerning activity to judge the garbage and decide how to sort it out. Hence, this person would be reflectioning in action and also doing *problem-solving*[34] but not undertaking design. This is why some design theorists such as Armand Hatchuel (Hatchuel, 2002), do not grant attention to Schön's theory of *reflection-in-action* and argue that it fails to work as a theoretical standpoint explaining design.

Having provided an introduction to design as a discipline, the definition of design as an activity, and the clarification about the popular paradigms that have echoed in the study of design; it is moment to pay attention to notions of the design practice. To that the designers deal with while designing and the outcome of their designing activity: the design problems, design solutions and constraints.

DESIGN PROBLEMS, DESIGN SOLUTIONS AND CONSTRAINTS

Two terms shape and define the start and the final state of the process of designing: the design problem and the design solution (Lawson, 2005) (Dorst, 2015) (Dorst, 2004) (Dorst, et al., 2001). A design problem is the initial situation encountered by the designer; while the design solution is the response to that problem by the designer (Chan, 1990). However, the explanation of such notions is more intricate than what it seems, due to what happens when designers design, what takes place while designing, and how design problem and design solution go shifting or morphing along the process (Lawson, 2005) (Dorst, 2015). For this reason, instead of providing a rigid definition of both terms, design theorists give a series of characteristics to facilitate the understanding of such notions.

DESIGN PROBLEMS

Design theorist Kees Dorst envisions contemporary design problems as open, complex, dynamic and networked, as well as sometimes presenting paradoxes. For Dorst, design

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[34] Besides, nothing refrains *problem-solving* from being also a reflective activity. As well, designers with a *problem-solving* approach can also elicit their process and knowledge to have a better understanding of their actions.

problems are situations that are not easy to pin down or clearly definable; they tend to be immersed in manifold and constant changing contexts; they present hard-to draw boundaries and are bound to the influence of diverse groups of stakeholders (Dorst, 2015). Moreover, these problems can even be paradoxical if they imply for the designer the need to fulfill two or more conflicting conditions that are true or valid in their own right, but for logical or pragmatic reasons are not compatible (Dorst, 2006).

Enterprises that imply converging numerous points of views, needs and requirements, and that represent open, complex, dynamic and networked design problems[35] such as Dorst depicts are, for instance, the design of multicultural-inclusive and sustainable living quarters or the development of communications interconnecting cities while not causing detriment on the life quality of people living around the constructions nor on the environment (Dorst, 2015). While an example of a design problem representing a paradox would be the design of a very robust machine that has to be placed in a limited-space room while being visually undetectable; two characteristics that seem contradictory but that the designer would have to meet (Dorst, 2006).

For Bryan Lawson (2005) design problems are totally interconnected with design solutions and one leads to the other and vice versa. For Lawson, design problems cannot be comprehensibly stated, which means they entail many uncertainties that hamper their formulation and in some cases even as well their proper identification. Design problems imply a subjective interpretation and tend to be organized and structured to be treated; the problem will be analyzed based on the priorities and previous experience of the designer that faces the problem, who at the same time most likely will treat the problem based on a specific set of criteria imposed by the design context, i.e. such as power to make decisions, time limitations and resources available.

DESIGN SOLUTIONS

Design solutions (Lawson, 2005), on the other hand, represent an unlimited number of different alternative responses to a design problem. To a problem, there can be many different efforts to treat that problem. Design solutions are not optimal solutions but rather acceptable or satisficing; they can never be perfect, and in many cases they imply granting more importance or attending to specific factors while ignoring or postponing other factors (Lawson, 2005). Design solutions once existing represent a progress and an expansion in the world; they are new existing entities opening the door to new knowledge and discussions. As well, design solutions give place to new design problems (Lawson, 2005). For instance, with the rise of virtual reality, new design problems on how to playfully implement this technology surface.

Bryan Lawson (2005) depicts design as a process and as having numerous characteristics:
- Design is endless. As there can be an inexhaustible number of design possibilities there cannot be a finite and identifiable end; instead, the designer judgment comes to play to define a pertinent conclusion.
- There is not a correct or infallibly process; there is no certain good way of designing neither a sequence of operations that can guarantee a result, because design can be done in many different ways.
- Design involves not only finding problems but also solving them.

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[35] These are extreme examples from design that allow seeing the whole picture on the paradoxical and complex of contemporary design problems. Applications of this definition into game design will surface by identifying as part of the study undertaken in this dissertation, what kind of design problems designers of indie games deal with.

- Design involves subjective judgment; designers bring their very personal view to the activity.
- Design is prescriptive; dealing with what can become real, what can be produced. And it happens in the context of a need for an action; it takes place where a change is required (Lawson, 2005).

For the understanding of the structure of design, Lawson (2005) presents a model that aids grasping how different actors configure and impose constraints to design problems (figure 4.1). As Lawson explains (2005), this model has been customized by several theorists to fit their needs and field of study. First, because Lawson's model is not an absolute rule for design; it only tries to depict one of the most common design scenarios and its actors. And second, because the concepts related to constraints and their definitions and classifications vary from one design field to another. Whether the field is architecture, graphic design, or urbanism, the way the term constraint is treated, would differ.
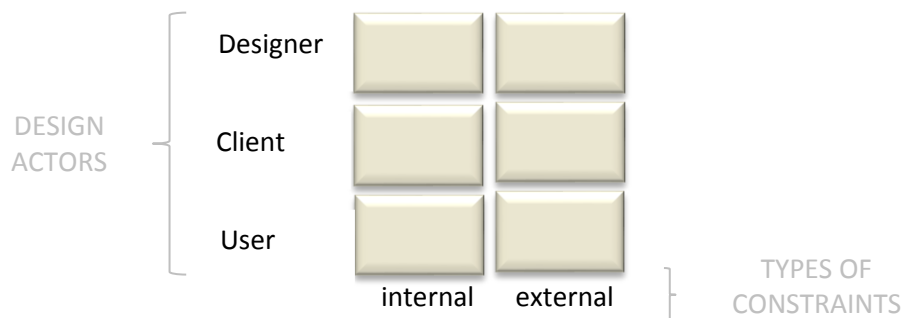
Figure 4.1. Customized version of Lawson's model depicting the relation between actors and constraints (Lawson, 2005 p. 106).

Lawson's model consists of several actors[36]: a client that commissions the design, a user for whom the design is for and is not the same person as the client, and a designer that realizes the design and is neither the same entity or person as the client and user. But there can be oftentimes different actors in design, reason why the model has to be readapted. Some clients can be also at the same times users of the design they are commissioning. Or a designer in certain situations can be the originator of the design problem, therefore also playing the role of the client (Lawson, 2005).

In Lawson's design actors model (2005), the designer is the main actor facing the design problems and working out a design solution. Designers are expected to have the skills to identify and formulate the problems from their clients and come up with a creative solution to

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[36] Lawson (2005) explains that his model is a flexible and customizable tool to understand the role and interrelations of all the different persons or entities that intervene in a design. The model is explained and presented in this chapter already in a customized way. Lawson's original model also has an additional actor, the legislator; a person or entity whose legislative work can influence or impact the way a design is realized. For the purposes of this dissertation, this actor has been discarded because the influence of this actor is not identifiable in the design undertaken by the designers of indie games.

such problems (Lawson, 2005). Designers mediate between clients and users, trying to provide what will satisfy the client's needs and what the user will be able to use. However, this mediation entails as well that in some cases there are negotiations and tensions between the views of the designer and the views of the other actors and their demands (Lawson, 2005).

The users are the receivers of the design solutions, and in many cases are not the same entities as the client (Lawson, 2005). For instance, if a highway is built by a municipality to connect inhabitants of two communities, the inhabitants of the towns are the users and the municipality is the client. Since users are in many cases not the same as the client, their inclusion within a design problem implies turning to different disciplines and gathering knowledge about the user's needs and characteristics in order to provide solutions that address them (Lawson, 2005).

The client[37] is generally the one who has a need and calls in a designer to solve a problem. It is the client that expresses the problem and hands it over as a brief to the designer including the specifications and requirements to be fulfilled (Lawson, 2005). However, in some situations, the client can also be unaware of the boundaries of the problem or even be unable to identify it with certainty, requiring of the expertise of the designer to find a solution to an unspecified need (Lawson, 2005).

DESIGN CONSTRAINTS

Besides these three actors, designers, users and clients, the other important concept within Lawson's model is constraints (2005). Constraints are elements that define boundaries within the designing work in a physical, logical, semantic or cultural way (Norman, 2013). Constraints are the limitations as well as required and desired specifications that the designer has to work with as part of a design (Lawson, 2005). For instance, at contests revolving around designing games that are played just with one button, the one-button restriction imposed to the design is a constraint. Designers can also decide they want to make a very simple game and only have a single action for the player; this delimitation would represent a self-imposed constraint. As well, a specification by a publisher stating that a game should offer a play session with a length of maximum 30 minutes, represents also a constraint for the designer of the game.

Constraints have a domain of influence; they are either *internal* to the design problem or *external* to it (Lawson, 2005). For the designer of a game, an *internal constraint* is, for instance, how to fit elements of a story or narrative within the level of a game world; the requirement to include clues that tell a story within a level will limit and guide how the designer composites the design. As well, the need to match the visuals of a game, the mechanics and the music to afford a desired atmosphere represents also an internal constraint. An example of an *external constraint* in the design of a game is the capabilities of a game engine. If the engine cannot render a big amount of elements, the designer is bounded to work with a minimum set of resources and would likely have to make a very simple game. Another example of an external constraint is the players' preferences. If the intended users of a game are male teenage hardcore gamers, the design of the game would have to revolve around a high speed

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[37] The reception of a design can also be seen as part of the design process according to Armand Hatchuel (2018). Since users interact with an object they lack knowledge of, while interacting and using a design, users expand their knowledge. This expansion of knowledge may imply the need of earning, training, transforming or exploring. This means designers, users and clients experience design from different social standpoints.

gameplay. The designer of the game would have to consider all the elements that favor creating such a gameplay so that the players' needs are met.

The significance of internal and external constraints comes forward when related to the actors of design previously presented. Lawson envisions a schema in which all these elements are included as two columns of bricks; where the actors are placed on top of each other vertically, and the constraints are spread horizontally (Lawson, 2005). The schema is as follows:
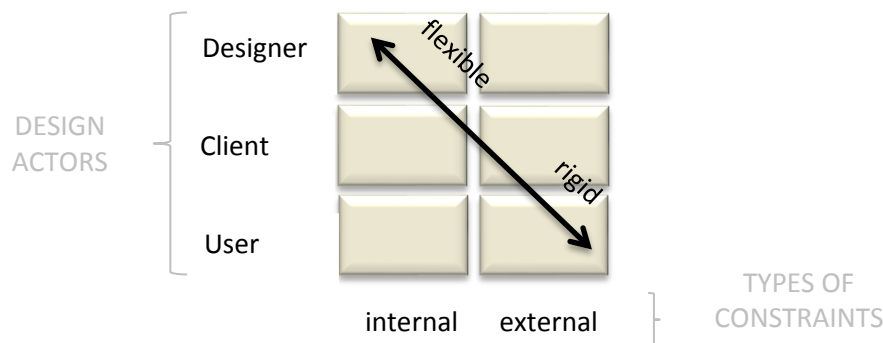
Figure 4.2 Customized version of the model on actors and constraints by Bryan Lawson (2005 p. 98).

By linking a constraint domain, either internal or external, with an actor, it is possible to understand how constraints change their nature. According to Lawson's schema, constraints are more *flexible*, more amenable to negotiations and modifications, if they are closer to the designer's field than the users' field. While constraints get more *rigid*, rigorous and nonnegotiable, the more afar they get from the designer and involve other actors (Lawson, 2005). Hence, the designer of a game working with self-imposed specifications such as keeping the game simple by using just 2 mechanics, has total power to decide if this criterion has to be altered or even by-passed in order to afford a more engaging experience for the player.

On the other hand, in the design of a game for visually-impaired people, the disability of the users represents an absolute imposition, a rigid constraint that cannot be negotiated. This specification forces the designer of the game to discard visuals and base the gameplay experience on other physical senses. When it comes to clients providing specifications, the designer of a game can oftentimes have certain power of decision and in some cases negotiate the constraints to design with. For instance, if a client requests a game for tablets and the concept demands a user interface that simulates a joystick, the designer can persuade the client to simplify the game idea and reduce player interactions to tapping and sliding in order to avoid the unfriendliness of a simulated joystick on a tablet surface. Nevertheless, in some situations client specifications involve characteristics that the designer cannot negotiate and that are hard to deal with, such as market specifications on how and where a game has to be sold.

CRITICISM

The theories so far presented designate the matter or situation the designer deals with as the design problem and depict it is as an actual problem to be solved (Dorst, 2015) (Lawson, 2005). However, the matters that a designer deals with are not always actual problems. Armand Hatchuel exposes a scenario of design that consists of a creative event or situation where no actual problem exists (Hatchuel, 2002). Hatchuel explains the concept of design as a project and differentiates this concept from a problem-to-be-solved by comparing the tasks of a group of friends in two different scenarios: deciding on what movie to watch and throwing a nice party (Hatchuel, 2002).

In the first scenario (Hatchuel, 2002), deciding what movie to watch, all the characteristics and procedures of a *problem-solving* approach can be applied (Simon, 1996). The friends cannot watch all the movies and have to conciliate tastes and interest; therefore, search strategies need to be applied. Computational costs have an impact in the solution exploration: the friends would just read the movie reviews and critics that time allows them. The friends would also turn to their previous knowledge to discern about the reviews they read. As well, they would adopt a specific logic to make up their mind and choose a movie. Expertise can also intervene if some participants of the quest also have extra knowledge on the current films that could help find a solution, such as sharing tips on what movies have won awards (Hatchuel, 2002).

Hautchel's (2002) second scenario, throwing a nice party, can involve the same solving procedure as the case of deciding what movie to watch. However, throwing a nice party is an infinitely expandable concept. It entails undefinable or uncountable parameters; it can hardly be seen as a list of specifications or requirements leading to a solution. And even if from Simon's view (1996) it could be argued that this would be an ill-structured problem needing to be well-defined, a "party" as a term is semantically clear and needs not chunking or logical reduction to become well-defined.

Moreover, the constraints involved in the activity of throwing a party, such as costs, time and location can influence but not determine the final outcome. There is no mechanistic relation between what the project "a party" represents and the undefinable number of scenarios the organizers can face. The party can still be organized even if the budget is low, if the time does not fit many people or if the location does seem to be proper enough for dancing. And most importantly, while in the previous case about choosing a movie the "clients" of the design were the participants themselves, "throwing a nice party", involves external guests. These guests also have a role in the design process by having their expectations included. This is how social interactions represent resources for design (Hatchuel, 2002).

By bringing together the two views on problems and projects, it is possible to conclude that what a designer deals with are either problems (Dorst, 2015) (Lawson, 2005) or projects (Dorst, 2015) (Hatchuel, 2002); where the former require a solution and the latter are contexts entailing a creative expansion of the reality through design (Hatchuel, 2002). These two scenarios are structured by actors, the designer, the user, and the client; who come into play by structuring the design and setting to different extent constraints that have to be processed as part of the design. These constraints are sometimes unavoidable, while other times can be negotiable or even ignored depending on who sets such limitations or specifications.

Having discussed design problems, design solutions and constraints, it is important to shift the focus towards the designer and find out how the designer approaches such matters.

HOW DESIGNERS APPROACH THE PRACTICE OF DESIGN

Problem-solving (Simon, 1996) has already been presented as the scenario in which an ill-defined problem has to hierarchically and sequentially be transformed into a set of well-defined problems until reaching a *satisficing* solution. From Kees Dorst's (2015) and Bryan Lawson's (Lawson, 2005) perspectives, *problem-solving* is a questionable approach for design. For Dorst (2015), the problem-solving approach requires identifiable, manageable and controllable conditions that contemporary design problems do not feature, such as the design of the sustainable living quarters or the communications interconnecting cities used as example in the previous section of this chapter (Dorst, 2015).

Moreover, from Dorst's view (2015), problem-solving would be just one of the several approaches to undertake while designing, and only when the necessary conditions for it are met. Instead, the approach of experienced designers towards contemporary problems according to Dorst is to rework the problem based on their expertise and subjective view. The designer would "frame" the design situation instead of taking the initial problem as unchangeable (Dorst, 2015).

FRAMING

Framing is the name of the series of different approaches that Kees Dorst identifies in the design undertaken by designers. Framing is a perspective formalized by Dorst after decades of research on design studying the nature of design problems (Dorst, 2004)(Dorst, 2006), analyzing case and protocol studies (Dorst, 2015) (Dorst, et al., 2001) (Lawson, et al., 2009), and comparing thoroughly the prominent paradigms in design (Dorst, 1997), *problem-solving* (Simon, 1973) and *reflection-in-action* (Schön, 1983).

Dorst's concept of *framing*[38] (2015) expands from Donald Schön's idea about the designer creating a frame for design, about setting up a new stance from which the design practice is undertaken:

> "When we set the problem, we select what we will treat as the things of the situation, we set the boundaries of our attention to it, and we impose upon it a coherence which allows us to say what is wrong and in what direction the situation needs to change. Problem setting is a process in which, interactively, we name the things to which we will attend and frame the context in which we will attend to them" (Schön, 1983 p. 40).

For Schön (1983), a frame is a new way of setting a problem; a new construction imposed on the situation, either when designers deal with messy problems or when the circumstances faced fall outside the boundaries of an applied theory or controllable structure. For Dorst (2015), *framing* is the ability to create new standpoints to problem situations. *Framing* takes place when the designer recognizes that the solution to a problem does not only lie in a given interpretation or in its paradoxical circumstances, but rather in other surrounding elements. The designer turns to such surrounding elements and their exploration to come up with a novel position to undertake design (Dorst, 2015).

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[38] The "frame" is not a concept that can be exclusively attributed to Donald Schön (1983); both Herbert Simon (1973) (1996) and Horst Rittel (1972) (1987) use the same term and the same connotative meaning for their predecessor texts with theories on *problem-solving* and *wicked problems*, respectively. And alike Schön, neither Simon nor Rittel provide a specific definition to the concept.

Dorst (2015) pictures several ways through which *framing* is conducted by designers. *Framing* happens when the designer reworks and redefines the problem definition, which in consequence, leads to a different design outcome[39]. *Framing* also occurs when the designer reformulates both the context of the design problem and the context of the potential design solution until finding a fitting match between their new modified or developed forms; it is finding new versions for the problem to solve and the expected solution and establishing a "bridge" representing the crystallization of a new core solution idea.

Framing (Dorst, 2015) is also visible when the designer incorporates philosophies, discourses and visions of the client into a design, or when supplementary narratives are also embedded, such as plots, stories or values for inspiration and appeal[40]. *Framing* also consist of the personal and characteristic marks and touches by the designers that make their designs so peculiar or unique. These are their personal outlooks, discourses, artistic statements, agendas, traditions, routines, work methods and even habits that permeate and get embodied in the design[41].

An example of *framing* for the design of a game is documented in *Rules of Play* (Salen, et al., 2004) with a case study on the making of the board game *Lord of the Rings* (Knizia, 2000). Rainer Knizia was commissioned for this design. He got a brief with the specification of designing a sophisticated family game with a play length of about one hour. Besides this rigid constraint, Knizia set himself the constraint of maintaining the spirit of the *Lord of the Rings* book (Tolkien, 1954) even if covering the whole storyline was impossible as part of a one-hour game session.

Knizia's framing consisted of exploring the underlying themes within the world of Tolkien and the motivations of the characters. Knizia structured the game concept around the hobbits and their departure from their shire on the quest to destroy the ring of power (Salen, et al., 2004). Knizia developed and then defined a problem situation by taking the concept of a common quest and common enemy and materialized it into gameplay: he ideated having a cooperative game in which players are hobbits and have to collaboratively go through obstacles and balance their very different personal skills to flee from Sauron, destroy the ring, and avoid getting corrupted by the ambition to possess the ring. The game also ended up embedding a series of episodes referring to prominent moments of the narrative of Tolkien's story. As well, it was illustrated by the artist of the original story to help convey the ambience of fantasy of Tolkien's universe (Salen, et al., 2004).

But Knizia design was not only *framing*, as he went through the process he also turned occasionally to a *problem-solving* approach. As previously described, when doing *problem-solving*, a designer sets priorities within the design process and hierarchies and goes one by one paying attention to and finding a satisficing solution for what has to be first solved (Simon,

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[39] This is the case of a designers being called in by a client to fix a problem and after getting a brief from the client, the designer reformulates the problem to the client with different traits. It is when designers argue their view is the appropriate design context upon which to work on, because their skills allow them recognizing the real issue to tackle. In this scenario, designers switch role from technicians to facilitators of design (Dorst, 2015).

[40] These inspirational elements do not represent either the problem or the solution for the design; they rather constitute scaffolds or structures for meaning-making mostly common among highly-skilled or avant-garde designers as well as artists (Dorst, 2015). As exemplified by Dorst, Dutch bag designer Hester van Eeghen got elements to design with by following people doing their errands and imagining their personal treats and observing the handling of the purchased goods. van Eeghen's actions resulted in the design of bags that are brief but can expand, have compartments, or can be worn in different ways (Dorst, 2002).

[41] This is the case in which some designers are commissioned by the client specifically because of their practice, personality, style or repertoire; because their designs stand out for their uniqueness (Dorst, 2015).

et al., 1972) (Simon, 1996). Before applying a frame to the design, before formulating what he would be working on because the project was somewhat undetermined, Knizia realized he needed to develop a deep understanding of Tolkien's universe. Thus, he turned to a friend of his, a big Tolkien fan, not only to know more about the story of *Lord of the Rings* (Tolkien, 1954), but also to grasp the fantasies and enjoyment fans experience and that are not embodied in the books (Salen, et al., 2004). Just as Dorst argues (2015), designers shuffle between *problem-solving* and *framing*[42] through their design activity.

In fact, Dorst and Lawson envision *problem-solving* (Simon, 1973) (Simon, 1996) and *framing* (Dorst, 2015) as approaches that depend on the expertise of the designer[43] (Dorst, 2015) (Lawson, et al., 2009). Based on empirical research, the theorists claim that *problem-solving* is the approach most frequently observed amongst designers with less years or work experience, while *framing* is most common among more experienced designers. A designer *problem-solving* would chunk down the problem to smaller sets, would prioritize them, transform those bites from ill-structured to well-structured problems, and would find a satisficing solution to each set of the problem. And designer doing framing would reformulate and even transform the elements of context for the design and could also try to include or embody in the result discourses, motifs and philosophies.

However, Lawson also claims that there is no right or wrong way to do design, which implies that both approaches are valid choices for the designer. Moreover, considering the complexity of contemporary design problems as depicted by Dorst (2015), the context and structure of the situation can lead or even force the designer to choose either one approach or the other. Moreover, contemporary design contexts are so complex and entangled that the designer has to switch continuously from one approach to the other several times until reaching a final design solution.

C-K THEORY: AN OVERARCHING FRAMEWORK FOR THE UNDERSTANDING AND UNDERTAKING OF DESIGN

This section introduces *C-K theory* (Hatchuel, et al., 2003), a novel theoretical standpoint for the understanding and undertaking of design from an abstract and universally applicable way. This theory is introduced in order to have the theoretical foundations to envision design as the outcome of the purposefully-followed reasoning and logics of the designer. Through *C-K theory*, it will be possible to identify when and how the designers of games conceive the design they end up working on; if it is conceived at early stages of the development process, or if it arises through prototyping, by testing, or even while undertaking other kinds of activities.

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[42] Schön's *frame* (1983) and *framing* (Dorst, 2015) are distinct conceptual entities. The former pertains to the practices of all professions including those that do not imply undertaking design. The latter expands on the former and focuses on design as an activity and the designer as the performer of it, and grants attention to the nature of design problems or contexts where the design is executed as well as to the solution. As well, it includes actions that are characteristic of the designers undertaking design, such as handling philosophies or discourses and adding a personality to the object being designed. *Framing* is a very design-focused version of Schön's *frame*.

[43] Design problems do not necessarily entail the undertaking of *problem-solving* (Simon, 1973) (Simon, 1996) nor design projects always imply *framing* (Dorst, 2015). Even though design situations and their characteristics can favor one main specific approach, it is the determinacy of the situation, the degree of freedom granted to the designers and their expertise, what will make the designers decide on what is the most pertinent approach to undertake and how and when to switch from one approach to another.

C-K theory is a theoretical framework and design method proposed by Armand Hatchuel and Benoit Weil (2003) depicting how unknown objects or entities can be generated through the transformation of concepts and knowledge (Hatchuel, 2018). *C-K theory* intends to represent a unified rigorous framework for innovative design; its aim is to explain design in a way that is applicable to any design situation, field or discipline (Hatchuel, et al., 2018). And as design theory contribution, *C-K theory* stands out for its generativeness, understood as the affordance to produce novel solutions (Hatchuel, et al., 2011) through the expansion and reordering of knowledge of the designer (Hatchuel, 2018).

C-K theory is not only a framework for the conceptual understanding of design; it is also a tool to analyze and undertake design. In the book *Destin Theory*, Pascal Le Masson, Benoit Weil and Armand Hatchuel present the case study about a smart[44] shopping cart designed by using *C-K theory* (Le Masson, et al., 2017). The same theorists have also presented a study of the design courses of the Bauhaus, the prestigious German design institution from the decades of the 1920s; the aim of the paper was to reach an understanding on the degree of "generativeness" of the design taught to students (Le Masson, et al., 2015). Jacquelyn Nagel used *C-K theory* to teach bachelor's degree students how to conduct bio-inspired design; a design that borrows features and characteristics from animals and confers such elements to new technological developments (Nagel, et al., 2016). As well, several other applications have been reported covering the fields of social policy design, automotive design, artificial intelligence and other kinds of industrial implementations (Hatchuel, et al., 2009) (Le Masson, et al., 2017)(Hatchuel, 2018) (C-K Theory.org, 2018) (Special Interest Group on Design Theory of the International Society, 2018).

Armand Hatchuel and Benoit Weil (2009) ground *C-K theory* in the way that design and its process abstractly operate: in a practical context, design starts as a brief, as an idea, as abstract specifications or a series of constraints, as descriptions revolving around an undefined object whose characteristics are not wholly known. Based on this, the way to start designing is by formulating the incomplete and oftentimes also ambiguous properties of the desired object to be designed. An example of an initial and ambiguous formulation can be: a game that includes some kind of monetization principles but yet allows players to play long time sessions without paying for content, which also features an attractive theme and is in general fun to play.

These initial formulations originate from specific reasons; they have a rationale. The way in which these circumstances can be understood is by envisioning the interplay of the undefined ideas and the knowledge of the designers while designing. Hatchuel and Weil depict design in *C-K theory* as a model that includes both the unknown and what is partially known by the designer: the *concept space* (C) and the *knowledge space* (K), respectively (Hatchuel, et al., 2009). C or *concept space* is a domain for concepts, for the unknown or undecided for the designer. Concepts are propositions lacking logical status for the designer, they are neither true nor false within the knowledge available or attainable of the designer (Hatchuel, et al., 2009)(Hatchuel, 2018).

K refers to *knowledge space*, a domain for knowledge. Knowledge space encompasses statements that are hold as true or false by the designer (Hatchuel, 2018)(Shai, et al., 2012). These statements are abstractions of known objects as well as partly known relations among such objects; they can also be the conflicting views, beliefs and uncertainties that are hold as true or false by the designer. As well, they can be the properties of objects to design with and

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[44] Smart in the sense that the cart has the functions afforded by smart mobile devices.

the defining elements of the constraints and specifications around which the design has to revolve (Hatchuel, et al., 2009).

In a previous paragraph, an initial formulation for the design of a game has been presented: a game to be designed with monetization principles, with an attractive theme, and fun and playable for long time sessions. In this statement, elements pertaining to both C and K can be identified. To start off, the entire formulation would represent a set or element of C, because as proposition it is unknown for the designer on how the object and its characteristics can exist; it is ambiguous and undefined. As for the K, the designer can count already from the start with several knowledge bases to engage with through the design process. These are the beliefs and assumptions hold as true in the designer's thoughts, such as monetization principles, notions about game design, an understanding about current trends in games for attractive themes, ideas about entertaining mechanics, as well as a repertoire and information about already existing games.

In *C-K theory* (Hatchuel, et al., 2009)(Hatchuel, 2018), design and its process consist of the interplay between C and K, between the unknown and the known, and their transformation through design operators. The initial formulation[45] with which the designer starts the design process evolves originating new concepts; it undergoes a transformation defined as a partition. Notions[46] about the attributes and properties related to the object to be designed are then brought into the process adding new elements to the formulations the designer works with. Subsequently, new formulations are reached and validated through existing knowledge as well as through new attainable knowledge. After the continuous interplay of these kinds of operators a design is conceived.

A design solution arises when a concept or proposition allows the definition, understanding and validation[47] of a new object or entity[48], including its attributes, properties and conditions of existence. The design is complete once a new object is fully defined and it has become new knowledge in the repertoire of the designer; when new knowledge domains end up being connected through the discovery or creation of something previously unknown or not existing (Hatchuel, et al., 2011) (Hatchuel, et al., 2009)(Hatchuel, 2018).

There are four kinds of design operators[49] representing the different transformations propositions undergo through the design process within *C-K theory* (Hatchuel, et al., 2009):

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[45] In *C-K theory*, constraints are encompassed in the attributes or functions of the new object being designed; they are included in the formulation of concepts and propositions and hence play a crucial role in the expansion of concepts and knowledge (Hatchuel, et al., 2018).

[46] Knowledge can consist of facts of scientific provenance and even assumptions or beliefs that the designer considers to be true (Hatchuel, 2018).

[47] Some kinds of designs would also need to be visualized to be understood and verified for feasibility; especially in the case of complex creations.

[48] The outcome of the design not necessarily has to be something tangible; it can also be something abstract, such as a law.

[49] Only K->K operators imply such inferences as deduction, induction and abduction. C->C, K->C and C->K represent other kinds of reasoning and logic. For this reason, Hatchuel argues that the undertaking of design entails other types of reasoning. Moreover, these operators and the whole emergent scenario the dynamics of C-K theory depict design as a phenomenon affording and allowing discovery, creativity, observation imagination, exploring the external world, as well as the switching of lenses or mindsets from the designer (Hatchuel, 2018).

- C -> C operators represent the partitioning[50] of concepts or the origination of concepts into new concepts; they are new definitions or modifications to existing objects and the creation of new meanings (Hatchuel, 2018).
- *C -> K operators* search for notions in K that can lead to new knowledge that later on can be used to generate new concepts. These operators are the search for attributes, properties and characteristics in the existing knowledge of the designer that can contribute to the posterior partitioning concepts. As well, these are the passes in which a concept through the conjunction of attributes becomes new knowledge, and through validation eventually becomes the final design.
- *K -> C operators* generate new concepts from already known attributes, properties and characteristics. These operators are disjunctions in knowledge granting emerging sets of concepts with new expanding elements and maintaining the consistency of the new appearing propositions.
- *K -> K operators* include all kinds of reasoning expanding the knowledge of the designer based on previous knowledge, e.g. any kind of inference such as deduction, induction or abduction, as well as classifying or even performing algorithmic sequences.
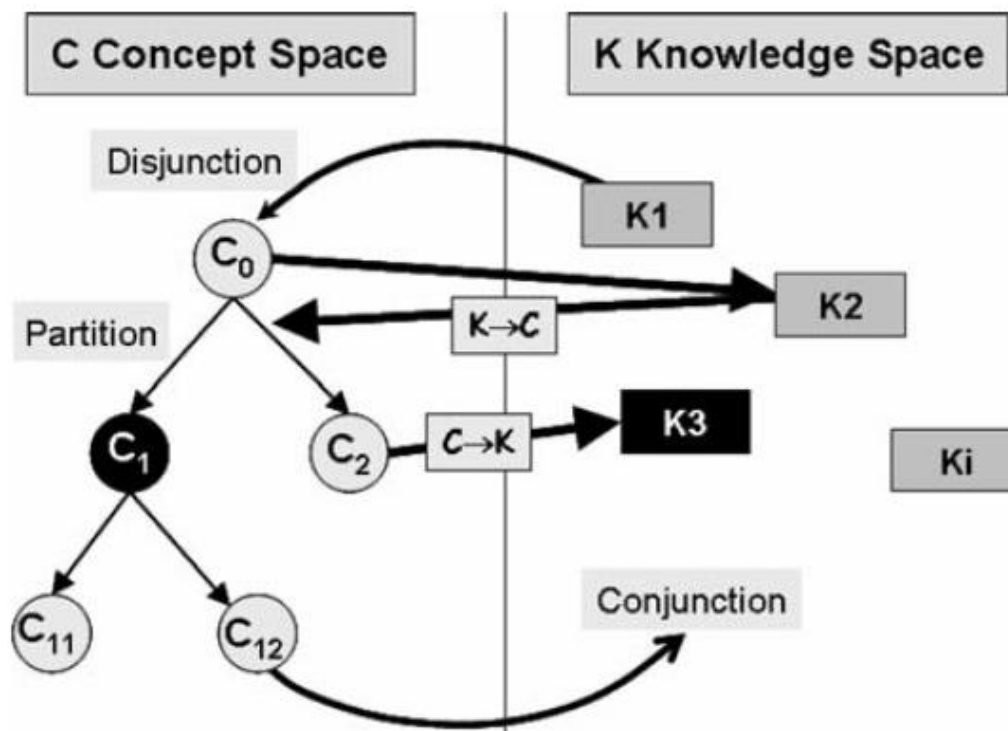
Illustration 4.3. Representation of C-K theory (Hatchuel, et al., 2009 p. 188).
At the left side of the illustration the concept space or C is represented. C is the "universe" of possibilities. In C, propositions that are undecided or ambiguous for the designer are located. At the right side of the illustration the knowledge space or K is presented. K are bites of knowledge nourishing the creation of new concepts. K is the library of knowledge. The process kicks off when, through a disjunction, a bit of knowledge (K1) inputs a new formulation for design (C0). This new formulation (C0) forks into new concepts: C1 and C2. C1 partitions successively into new concepts. A new bit of knowledge (K2) provides new notions to C0 generating the new proposition C2. C2 then searches for new attributes in K generating

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[50] While designing, designers can execute the partitions of concepts by applying design methods, such as drawing, prototyping, or even producing physical transformations of objects, e.g. assigning a fragrance to an object that normally lacks smell (Hatchuel, 2018).

K3. New elements in C and K are generated. Eventually, after a series of successive partitions and the execution of other design operators, a concept in C will originate new knowledge representing the definition, specifications and conditions of existence of a new designed object. When these new statement is revised and validated the design is then completed (C12).
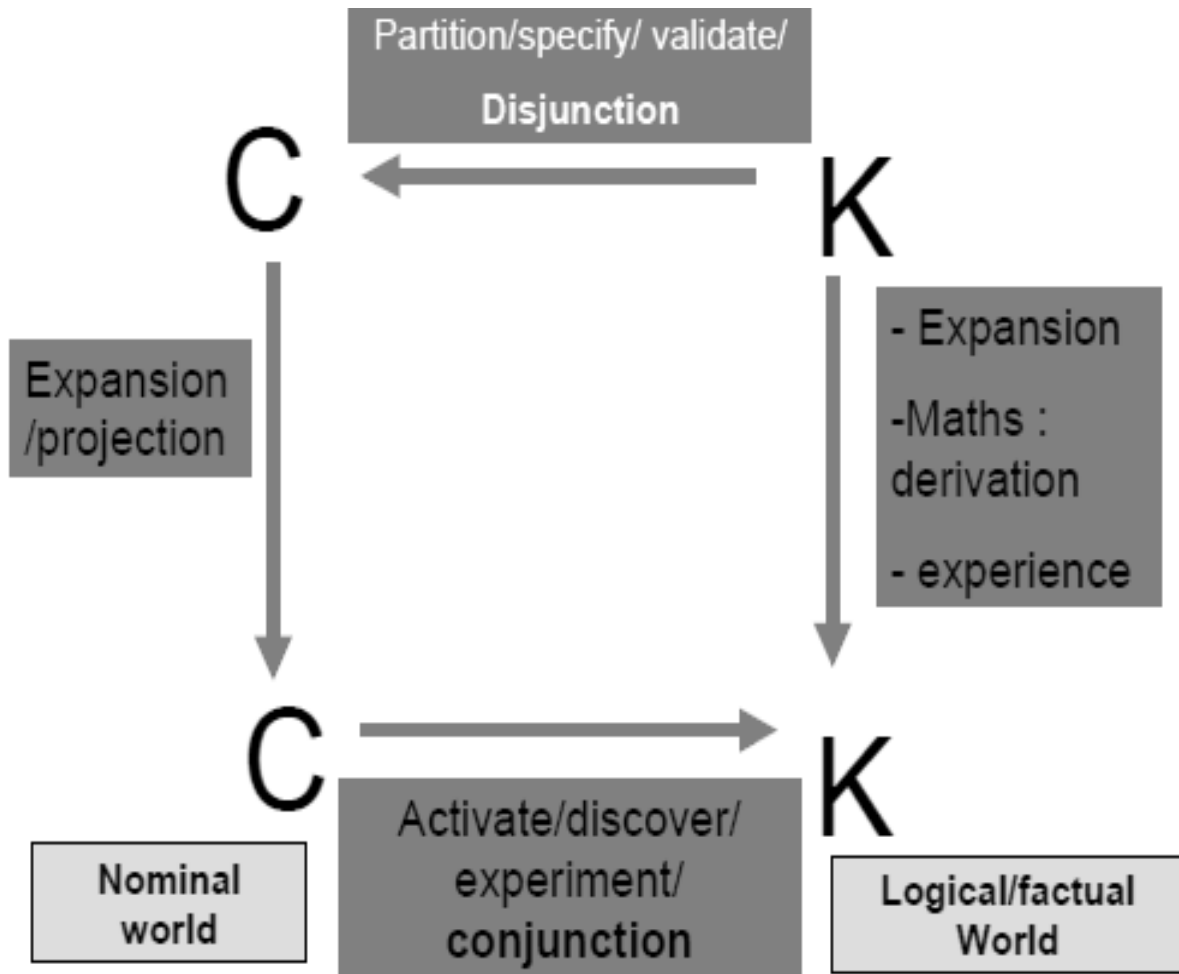
Illustration 4.4. Representation of the 4 kinds of design operators in C-K theory (Shai, et al., 2012 p. 2) At the left, the representation of the concept space or C. At the right, the representation of the area for the knowledge space or K. The color lines depict the potential design operators among elements during the design process. C expands in C partitioning concepts into new concepts; undecided propositions can project or expand into new undecided propositions. K expands into K generating new knowledge through mathematical operations, experiments and such inferences as deduction, induction and abduction. K partitions into C as disjunctions and C expands into K as conjunctions (Hatchuel, 2018).

In the current section, an example of an initial and ambiguous formulation for a design was introduced: a game that includes some kind monetization principles but yet allows players to play long times without paying for content, which also features an attractive theme and is in general fun to play. This example in terms of *C-K theory* can be simulated as follows[51]:

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[51] Example inspired by the game *Overcooked* (2016) and some other characteristics of free-to-play games.

C0: A game that includes some kind monetization principles but yet allows players to play long times without paying for content, features an attractive theme and is in general fun to play

K1: Notions on what games are about: rules, goals, procedures, play, etc.

K2: player demographics

C1: instead of a game, it could be an app of the clients' business…

C2: target groups can be young people, who own a mobile device, who play casually…

K3: personal beliefs and preferences

K4: current trends on gaming, what players find fun these days

C3: it can include such topics as cooking, fitness, startup management …

K5: own repertoire of stories and narratives

K6: Monetization conventionalities for games

C5: it could also include characteristics of social groups labeled as millennials…

C4: the players could get bonus and benefits not only by paying but also if they…

● ● ●

C…   C…   C…

C56..: … the game could then… and also look… and be about… include… function this way…

DESIGN: The game **COOKFORFUN** is about cooking. Players prepare different dishes for crowds of people. Players have to combine ingredients and deliver cooked meals at several environments. The player points and drags on the screen to take, slice, shop and place the ingredients through the food preparation pipeline. Players earn money when they deliver successfully the order meals. With the earned money, players open new dinning places. Players can pay also to get extra workers, extra waiters and extra food ingredients to make their life easier. Players can also get these bonuses by watching in-game ads…… players also…. the game features also…. and so on.

Figure 4.5. The design of a game from a *C-K theory* perspective. The initial formulation (C0) kicks off the design process. This concept then forks in two paths to be explored by the designer of the game, C1 and C2. C1 strays away into a different possibility that is no longer a game but an app; C1 immediately dies out when being discarded. C2 on the other hand, is informed by knowledge available to the designer, such as game design principles, demographics on the target user and the tacit knowledge about game making and play the designer has interiorized through experience. C2 expands into C3 while also being informed by K5. K5 was knowledge obtained through previous knowledge about current trends of gaming. K5 can represent deductions, inductions or abductions. C3 forks into C4 and C5. C5 is not explored further. As for C4, it originated with knowledge about monetization principles. C4 branches successively over and over again. Suddenly, after numerous conceptual expansions, the concept C56 arises and is then verified for its attributes within the knowledge space. This operation results in determining this is now new knowledge and the final design.

DESIGN STYLE

The undertaking of design is not executed with a blank mind; designers design with a set of motivations, attitudes and beliefs, even if by some designers these traits are not so easy to identify or are not structured enough to be described (Lawson, 2005). Lawson (2005) refers to these features as guiding principles leading designers in their practice and sees them as part of a design style. For some designers these principles are a driving force, and in some cases even a moral status or goal to reach (Lawson, 2005). An example of this is Le Cobusier's measurement system inspired on the golden mean called *Modulor*, which can be seen in some of his most well-known architectural works. This pattern was the result of Le Cobusier's search for a standard system of proportions associated to the ideal of harmony in nature that could be applicable for design (Herz-Fischler R. , 1998).
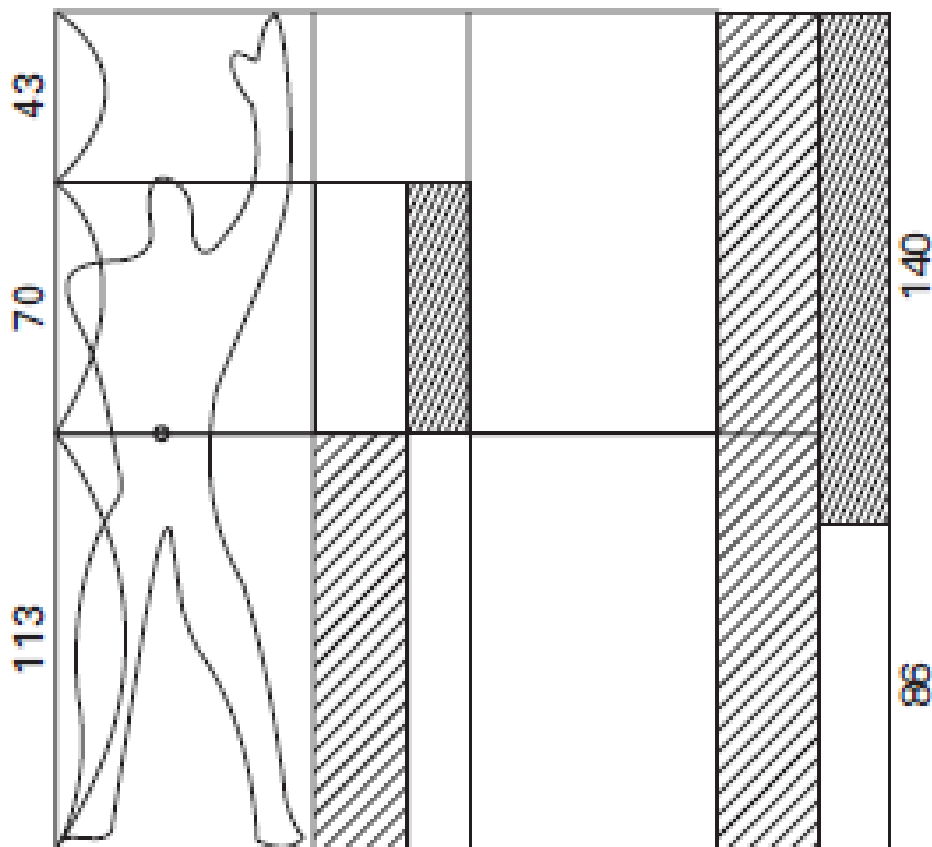
Illustration 4.6 Sketch of the proportions principle *Modulor* by Le Cobusier (Lawson, 2005 p. 161).

Chiu-Shui Chan (2000) defines style in design as the set of features or patterns identifiable in designs or in the way of making design. Style for Chan (2000) comes from personal preferences, personal knowledge, and mental models of the designer, as well as from rules and procedures from specific domains and methods on how to handle specific tasks. Style is embedded and influenced by surrounding cultural forces such as fashions, ideologies, and group identities.

Similarly as for Chan, for Lawson (2005), guiding principles or design styles have a strong link or dependency on the actors of design with which the designer interacts with, both clients and users, and especially with the constraints the designer deals with in the design practice

(Lawson, 2005). This is the case in which a designer follows the specifications and requirements on content, looks or formats of a school of thought with which the designer identifies to. Those values to which the designer affiliates become also constraints of the design.

For example, game practitioners that only design games at game jams bound their design practice to time and topic limitations that have a repercussion in the kind of games they design and their quality. Similarly, designers of games that only work with edible elements will find their design practice and their games strongly influenced by the constraints and affordances of food. This is how in these games actions by the player can also consist of eating game elements; something not common in regular analog games.

DESIGN METHODS: STRUCTURED ACTIONS AND PROCEDURES TO DESIGN

Besides the actions that designers intuitively and routinely do and the activities that the undertaking of design implies, designers have also developed more structured and formalized procedures and tasks to deal with the challenges of their practices (Dorst, 2015): the design methods[52]. Design methods are formalized, systematized and specific design activities, procedures or tasks (Cross, 2000), describing the structure of a design situation (Daalhuizen, 2014), and appropriate for more than a single design problem (Daalhuizen, 2014; Gericke, et al., 2015; Roozenburg, et al., 1995). Design methods lead from a given starting design position to a desired design situation (Eder, et al., 2008), facilitating the formulation and externalization of the designer's thoughts (Cross, 2000).

Some design methods can be traditional procedures for designing, for instance, something as simple as design-by-drawing. While some other design methods are over-formalized and systemic inventions of rationalized procedures that in some cases even have origin in other disciplines (Cross, 2000). For instance, the informal activity of looking up on books or catalogues can be formalized as a design method and be designated as the "information search method"; while the act of saving costs at an organization can then be the "value analysis method" (Cross, 2000).

Design methods are not responsible for quality; quality is not guaranteed by their use. The quality of design depends on the designer's skills and the design context (Löwgren, et al., 1999). However, theoretical views on design methods find their utilization as likelier to lead to novel design solutions than when not using design methods or when following internal thinking and informal and incoherent design processes (Cross, 2000). Design methods are also mediators for learning (Daalhuizen, 2014); they afford communication and the exchange of information among designers and other individuals involved in the design process. These people can pay attention to their design activities and grasp how knowledge expands while

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[52] Design methods along with other tools and techniques with the intention of supporting the designer's work are subject of a discipline within called design methodology (Gericke, et al., 2015). Design methodology studies the processes of design (Dorst, 2004) and tries to improve it (Kroes, 2002). Design methodology seeks patterns of connections among design problems (Latour, 2008); it is an approach for the design process based on sequenced actions and steps that allow establishing check-points for their evaluation (McCrory, 1966). Design methodology covers the analysis of how designers work, the systematization of optimal frameworks for the design process, the development and execution of new design methods, and the evolvement of design knowledge and its application into design problems (Cross, 1984).

designing in a structured and systematized way (Daalhuizen, 2014; McCrory, 1966). Besides, due to representing contexts for conveying information and applying concepts, designs methods constitute good means to spread out design theories and visions (Daalhuizen, 2014).

For Daalhuizen et al. (2013), design methods can be positioned within a fluid continuum based on the emphasis each design method has on the processing of information and its intended goal (see Illustration 4.7): the more the design methods instruct on considering the most complete information about a design situation and aim at reaching optimal rather than satisficing results, the more systematic the design methods are; whereas the more the design methods allow considering just partial information or particular aspects about a design situation and aim at finding a satisficing rather than an optimal solution, the more heuristic the design methods are (Daalhuizen, et al., 2013).

For instance, low-fidelity prototyping is a predominantly heuristic design method because it implies not paying detailed attention to the characteristics of the object being prototyped and the lack of sharpness with which this design method is undertaken has no crucial implications in further phases of the design process. Morphological analysis is a design method mainly considered systematic because it implies describing comprehensively the characteristics of an object or situation and the accuracy with which such attributes are depicted are likely to have great implications in further steps of a design process.
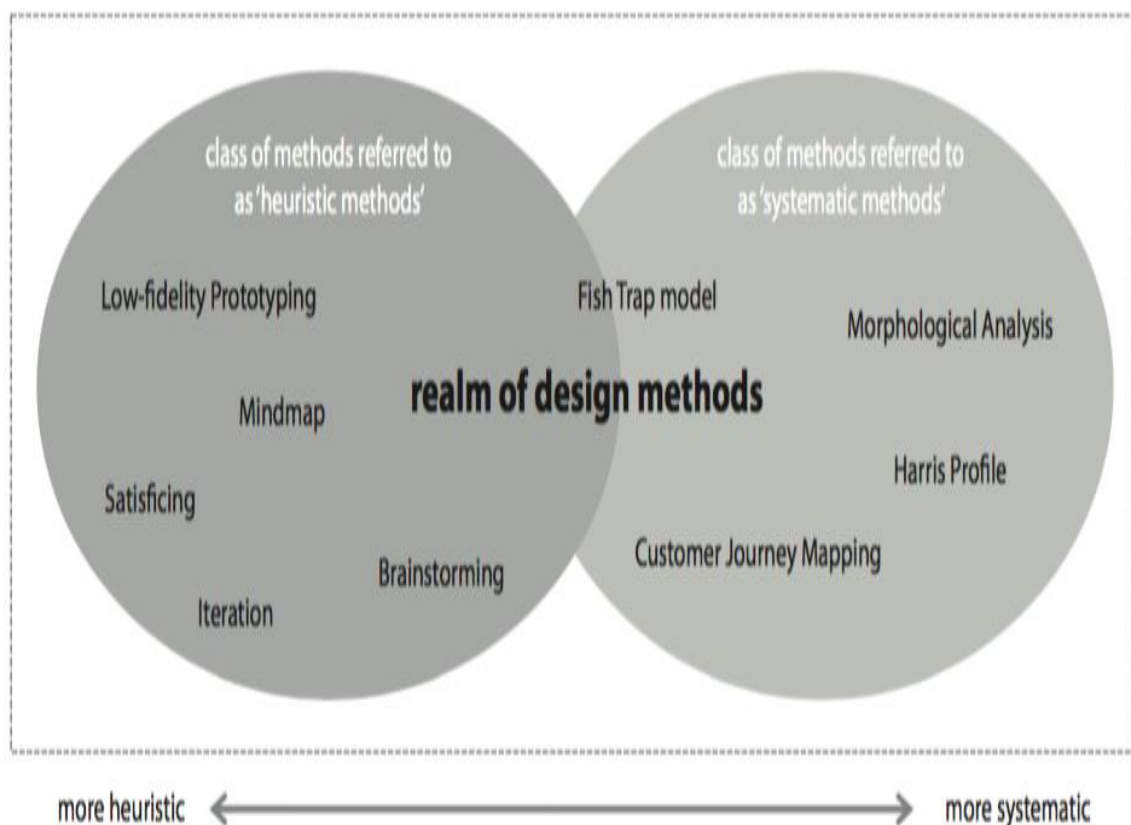
Illustration 4.7 Diagram by J. Daalhuizen showing how methods can be schematized between being more heuristic or more systematic and how they can be distributed within that continuum (2014 p. 35).

Design methods are not the same as design models. Design models are the representation of philosophies, strategies or views on design and how design should be conducted or on how actually design is undertaken (Evbuomwan, et al., 1996). Evbuomwan, Sivaloganathan, and Jebb, (1996) clasify design models in two types: prescriptive and descriptive. From the view of these academics, prescriptive design models (illustration 4.8) tend to have a global approach and suggest, as procedural steps, the best ways to carry out design (Evbuomwan, et al., 1996). Descriptive models (illustration 4.9), on othe other hand, can be seen as depictions of the phases of design with schematizations of the designer's actions and activities; these models emanate from studies of practical experiences portraying how design is carried out (Evbuomwan, et al., 1996).
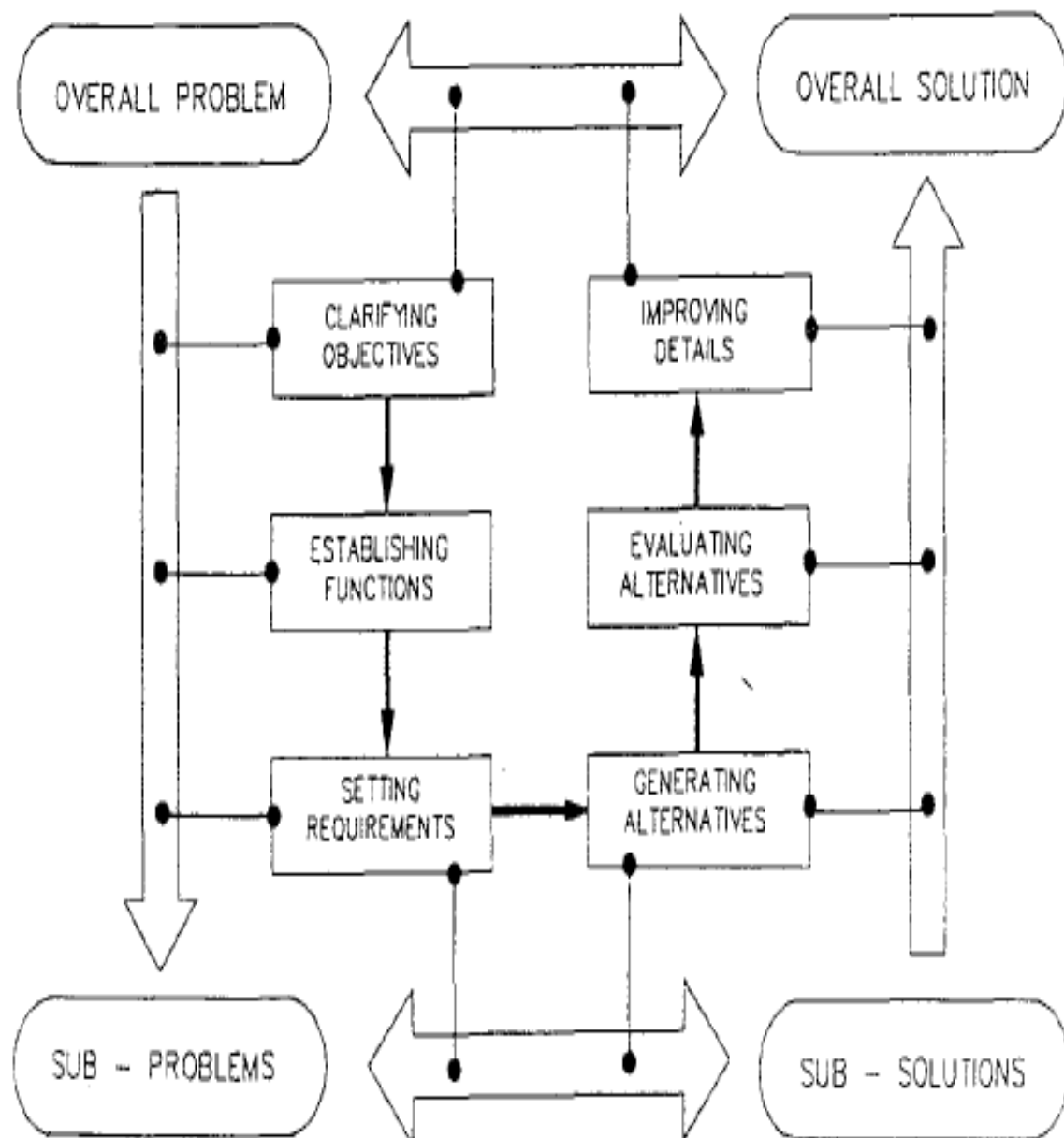
Illustration 4.8 A prescriptive model by Nigel Cross consisting of six different design stages and the relationships and dynamics among stages within a *problem-solving* context (Evbuomwan, et al., 1996 p. 309).
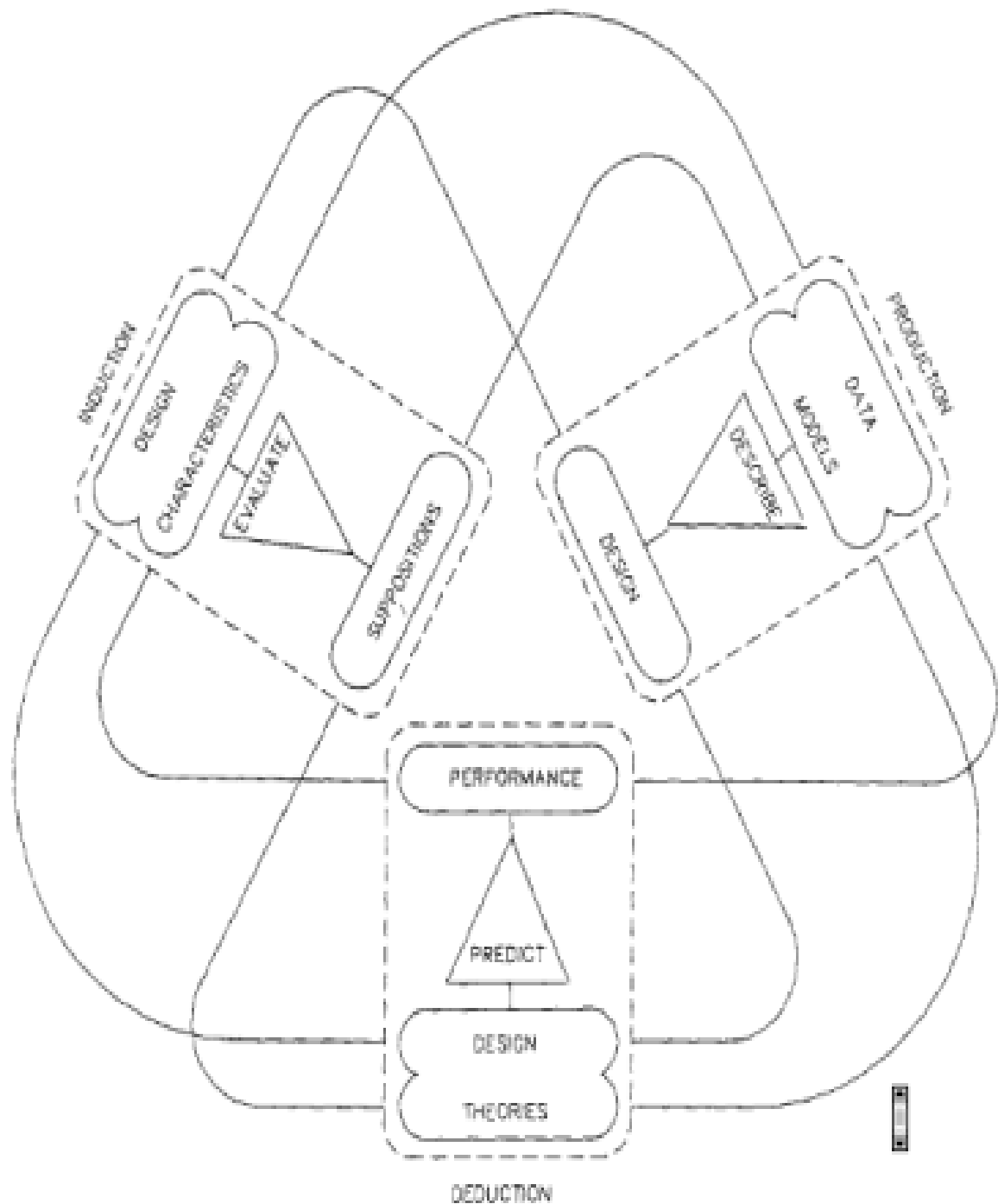
Illustration 4.9. March's desiptive model on design based on Pierce's models of reasoning, deduction, induction and abduction, (Evbuomwan, et al., 1996 p. 314).

The relation between design methods and design models is intricate. Since some models show how design is carried out, models can sometimes also be called "methods", while being just conceptually design models. Nevertheless, it is in the application of design models when design methods come into play. For instance, the stages of designer John Chris Jones's design model (Jones, et al., 1962), analysis, synthesys and evaluation, imply the potential application of several design methods, including list creation, elements classification and categorization, the re-writing of design requirements and brainstorming (Evbuomwan, et al., 1996). Similarly,

Nigel Cross suggests a design method for each of the design stages of his design model: for clarifying objectives, objectives trees; for establishing functions, function analysis; for stetting requirements, performance specification; for determining characteristics, quality function deployment; for generating alternatives, morphological charts; for evaluating alternatives, weighed objectives; and for improving details, value engineering (Cross, 2000).

Design methods should not be either seen as general heuristics (Yilmaz, et al., 2011), such as design statements, rules of thumb or design queues; for instance "think on your player", "provide points of interest in your game", or "make your game design flexible". Design methods can be in many cases totally or partially heuristic in nature (Daalhuizen, et al., 2013), since they pay attention to part of the information available, lead to an acceptable solution (Yilmaz, et al., 2011), and sometimes also include design principles and statements among several of their instructions or constituents (Hubka, 1983). However, design methods have directives and hierarchy among their elements or constituents (Hubka, 1983), which provides guidance and specificity to the designers in their tasks. Conversely, general heuristics lacks direction and offers ambiguous design support. The designers are left down to their own resources to interpret and find out how to implement such a rule of thumb as "think on your player"; the ways to do so are infinite due to the vagueness of the statement.

THE BOUNDARIES BETWEEN THE DESIGNER AND THE ARTIST

While discussing design, Bryan Lawson (2005) draws some similarities and disparities between art and design, between the artist and the designer. His intention is not to define a concrete difference between art and design, as he acknowledges that the boundaries between the two are intricate and hazy. Lawson (2005) finds common between design and art the value of aesthetic appreciation, meaning that visuals are also a valuable criterion within the judgment of design, as well as in some situations, due to the context in which the design is immerse, the discourse it conveys, its themes (Dorst, 2015), design can also be seen as artistic (Lawson, 2005).

Moreover, from Lawson's view (2005), designers engage in a series of design acts and activities in order to do design, which are also acts and activities the artists undertake. As well, designers, just like artists, are favored when featuring divergent thinking, when they can have and follow several lines of thought to do their work. And both designers and artists seem to find through the externalization of their ideas such as drawings, the source for their ideas, and both designers and artists bring their personal concerns and views into the design process (Lawson, 2005).

Conversely, Lawson sees artists as freer in their practice than designers (Lawson, 2005).First, because artists do not find themselves in a rigid system of actors that includes a client and a user and where these two actors are also setting constraints. Even though artists can be commissioned, in general, artists have a big power of decision on their constraints and those constraints tend not to be hard, firmly structured or actor-dependent as the constraints the designers deal with. As well, the lack of dependency from other design actors, such as clients and users, grants the artists the freedom to shift attention and explore new problems and territories through their practice and allows artists the space to perform their work in an introspective and personal way (Lawson, 2005). Artists can typically pursue their interests and have liberty to pursue the direction of their minds and change trajectory as they feel it fitting the circumstances (Lawson, 2005).

In contrast, designers are restricted by other actors intervening in the designing, clients and users, as already depicted, and work with flexible and rigid constraints (Lawson, 2005). Moreover, the context in which the designers work forces them focus on working towards a specific goal or end and refrains them from personal explorations and limits them in freedom. From one time to another, due to limited resources or to the urge to accomplish the goal set, the designer will have to define a stop condition to her designing and deliver, instead of freely exploring an infinite set of possible design alternatives (Lawson, 2005).

CONCLUSIONS: REVISITING THEORETICAL CONCEPTS

In this chapter, all the concepts to be used for the study of the design undertaken by the designers of the so-called indie games have been discussed. First, design as a discipline was introduced, and design as a human activity was defined. As well, the two programs that have influenced the study of design in some schools of thought were explained: *problem-solving* (Simon, et al., 1972) (Simon, 1996) and *reflection-in-action* (Schön, 1983).Then, all the matters designers deal with while designing were presented.

A design problem represents a need of action from the designer (Lawson, 2005). Contemporary design problems have been depicted as complex, dynamic and network-dependent as well as paradoxical (Dorst, 2015). Design problems can lead to an infinite number of design solutions (Lawson, 2005) and are defined and structured by different actors besides the designers, who are clients and users (Lawson, 2005). These actors set to different extents multiple kinds of negotiable or rigid delimitations or requirements, known as constraints (Lawson, 2005).

As well, it has been presented that the design problem can represent a problem to be solved (Simon, 1996), or a project whose limitations or constraints are not decisive and can be definitive (Hatchuel, 2002). Designers face the situations of their practice in a *problem-solving* way (Simon, 1996), which entails chunking the situation from undefined into manageable and well-limited constraints, or by *framing* (Dorst, 2015), which means that the designers reposition the window from which they see the design situation and set new definitions to the design problem.

C-K theory (Hatchuel, et al., 2003) is an overarching framework to understand, analyze and undertake design. It consists of two conceptual spaces, the concept space or C, the "sea" of possibilities for design, and the knowledge space or K, the knowledge base of the designer. The concept space contains propositions that do not have logical status for the designer; they are not considered true. While the knowledge space contains all the statements that the designer considers to be true, such as facts, beliefs, assumptions and other values. Through four different design operators consisting of partitions, expansions, disjunctions and conjunctions of concepts and knowledge in the forms of the common patterns of reasoning, logical procedures, design methods or even physical actions, the designer transforms concepts into knowledge and grows concepts from knowledge until completing a design. Design terminates when a concept obtains the logical status of true and represents new knowledge for the designer.

When designing, designers can follow specific guiding principles or design styles, just as Le Corbusier followed a proportion principle he created called *Modulor* to design several of his architectural works (Herz-Fischler R. , 1998). These design principles do have an influence in the designing done by a designer (Lawson, 2005). Designers also turn to the use of structured and formalized procedures and tasks to aid their designing work, the design methods (Cross,

2000); such as brainstorming, list creation, mind maps, prototyping, etc. Design methods do not guarantee to the designer good results (Löwgren, et al., 1999), however, they provide coherence and guidelines for designing (Cross, 2000), something that heuristics and models do not offer due to their vagueness and lack of practicality.

As very end of this chapter, a brief distinction between the artist and the designer and art and design according to Lawson (2005) has come forward. Design relates to a market, while an artistic practice allows practitioners navigating through freedom and work on what is personal to them. Lawson's pointers will constitute the tool to determine if the designing undertaken by the designers of the so-called indie tends to be more an artistic practice than a design practice. If the design of indie games represents a different paradigm in comparison with game design.

CHAPTER 5: METHODOLOGY

This chapter presents the methodology of this dissertation. The structure is as follows: the first section reintroduces the research question and hypothesis in order to ground the chosen methodology and research methods. The second section presents a justification for the selected research methods. A brief introduction to the methodological approach of the dissertation will follow. The next section presents all the research methods, methodological approaches and strategies for data collection, sampling and data analysis. Details on how these methods were applied will follow. The chapter closes by mentioning other research works within game studies for which the same research methods and strategies have been applied.

GROUNDING THE RESEARCH

Chapter 1 already gave an extensive overview of the research question and the hypothesis of the dissertation. Yet, it is convenient to revisit such elements in order to connect them with the research methods chosen for the undertaking of the research. The research question of this dissertation is the following: **based on the design undertaken by the designers of the so-called indie games, does the design of indie games constitute a different paradigm compared to game design?**

As explained in chapter 1, paradigm refers to the connotation of the term used by Ian Hacking (Kuhn, 2012) to explain paradigms in science according to Thomas S. Kuhn (2012). Kuhn argues that within a single discipline different scientific traditions can coexist, each of them based on a different paradigm. Each tradition employs different methods, practices, laws and instruments and deals with diverse puzzles and problems until eventually one tradition absorbs the other (Kuhn, 2012). Following the same logic, this dissertation aims at finding out if the design of indie games employs and focuses on different principles, ideals and methods than the principles, ideals and methods around which game design revolves.

The hypothesis is as follows: the design of the so-called indie games and game design represent different paradigms of design. The former questions the most underlying assumptions upon which game design is based, such as designing under determinant constraints, designing with the player as main focus and following formalized design structures and procedures. The design of indie games does not comply with such traditions and principles so characteristic in game design. The design of indie games revolves more about personal interests and freedom while designing. And even though the design of indie games departs so much from the design foundations of game design, it fulfills all the characteristics to be formally considered design.

To answer the research question and prove or disprove the hypothesis, social qualitative research methods have been chosen. Social research methods are methodological practices and traditions guided by concepts and theories from the social sciences (Bryman, 2012). The term qualitative implies that the research primes attention to words and facts of the participants around the studied phenomenon rather than to quantification in the collection and analysis of data (Bryman, 2012). Before presenting these research methods, the rationale behind this methods selection will be explained.

JUSTIFICATION FOR THE RESEARCH METHODS

Indie games do not constitute a single movement or entity (Parker, 2013), but rather a plethora of discourses shaped by their participants (Lipkin, 2013). In order to get a general and global view around the phenomenon of indie games, the first choice for the research was to identify and sample the most financially successful indie games from the last decades. However, this idea was discarded because sales do not to imply design quality. Also, this approach jeopardized the nature of the research for considering games from a commercial perspective; something fitting more the characteristics and logics of mainstream games than the ethos of indie cultures.

The next move was to research on existing classifications and special collections of indie games that could serve as samples, such as countdowns and charts. However, all these were either too personal or arbitrarily made by their authors to represent a reliable source of information for a dissertation. The next choice was to check for venues, events and organizations dealing with indie games. This is how through research was found that *Indiecade* and the *Independent Games Festival* of the *Games Developers Conference*[53] were the two biggest events within the games industry dedicated to indie games. At these festivals, the most prominent indie games for numerous categories are awarded every year. This is how it was decided to have these two events as reference to identify the designers that could participate in this research.

Within design as field of inquiry, the *protocol study* is the research method used to study practical design activities undertaken by designers (Lawson, 2005) (Lawson, et al., 2009). A *protocol study* entails a researcher observes what designers do while actually designing something. The researcher gives a design task to the designers and observes how the designers design. After the design, the researcher conducts a series of questions to unveil more information about the design process and about the designed object (Lawson, 2005) (Lawson, et al., 2009).

To conduct a *protocol analysis* for the design of games is not an easy task, especially if the games to design are digital. This research method can suit well the study of the undertaking of design in *Game Jams*; but then such a study would revolve more about these kinds of events than on the design of indie games. G*ame Jams* such as the *Global Game Jam* are open to everyone with interests in games, not only people who are labeled as indie designers.

Due to these circumstances, the research methods chosen for the study of the design of indie games are the ones guaranteeing obtaining information directly from carefully selected indie game practitioners. This is how the *key-informant interview* (Tremblay, 2009) (Berg, 2001) (Bryman, 2012) and the analysis of data following a *constructivist grounded theory* strategy (Bryman, 2012) were chosen to construct a theoretical standpoint explaining the design of indie games based on narrations of design activities by festival-awarded indie designers.

OVERVIEW OF THE METHODOLOGICAL APPROACH

The methodological overview on the application of research methods of the dissertation is presented in figure 5.1. Shortly speaking, the dissertation consists in a general level of a *comparative case analysis* with two cases or units of study: game design and the design of

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[53] *Indiecade* and the *Independent Games Festival* of the *Games Developers Conference* are introduced in chapter 2.

indie games. Game design was formed as a *case* by constructing a theoretical framework, which is presented as chapter 3. The design of indie games is formed as a *case* or unit of study through a longer process. First, award-winning indie designers of the festivals *Indiecade* and the *Independent Games Festival* of the *Games Developers Conference* at any festival category from the last 10 years were *interviewed* (2006- 2016).

The answers to the interviews were turned into transcripts and analyzed through *coding*. *Coding* as a research method is the process of breaking data down into components and assign to it labels (Bryman, 2012). The *coding* was undertaken through a *thematic analysis* approach, which implies that different themes are identified in the transcripts and categorized. The themes for the analysis of the transcripts are the theoretical concepts presented in chapter 4 on design theory, which are summarized and presented further on in this chapter in the form of questions based on the information they aimed at obtaining as part of the *coding* process.

Through the analysis of themes in the transcripts, numerous codes were generated. The codes were categorized, patterns identified and generalizations established towards becoming theoretical standpoints, which is called *constructivist grounded theory*. The outcome of this data analysis shaped up the *case* or unit for the study of the design of indie games (chapter 6).

With the two formed cases or units of study, for both game design and the design of indie games, a *comparative analysis* was undertaken in order to find commonalities, divergences and generate new theoretical standpoints around them. The outcomes of this comparison allowed answering the research question of the dissertation and proving the hypothesis (chapter 7).
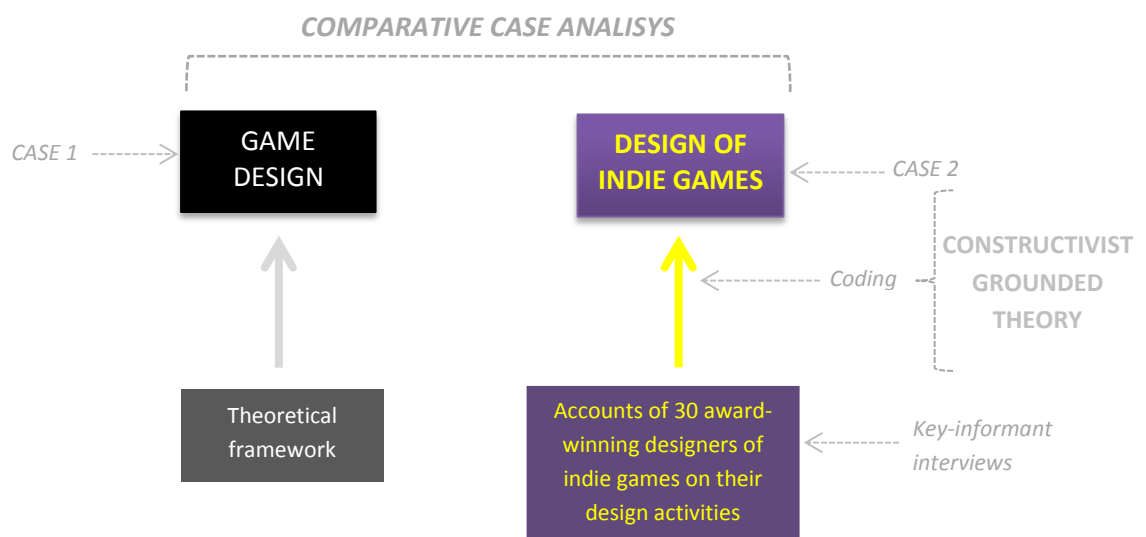
Figure 5.1 Overview of the methodological approach of the dissertation
At the right, the case 1, consisting of the unity of study on game design, which was shaped up as a theoretical framework. At the left, case 2, the design of indie games, consisting of theoretical standpoints generated following a *constructivist grounded theory* strategy through the analysis of the answers of *key-informant interviews* with designers of indie games.

The research methods, methodological approaches and strategies mentioned in this short introduction will be explained in the next section. Afterwards, details on the undertaking of these research methods will follow.

RESEARCH METHODS FOR DATA COLLECTION AND SAMPLING

The *key-informant interview* (Tremblay, 2009) was chosen as the research method for data collection to gather information about the design of indie games. The *interview* as research method consists of gathering information through a series of questions and answers in the form of a conversation (Berg, 2001). It has the aim of eliciting "from the interviewee or respondent, as he or she is frequently called in survey research, all manner of information: interviewees' own behavior or that of others; attitudes; norms; beliefs; and values" (Bryman, 2012 p. 209).

The term *key-informant* refers to an approach from anthropology (Tremblay, 2009). It entails that the interview specially addresses cautiously selected individuals or actors with a strong link to the subject of study. Interviewees are strategically selected considering the objective of the research and the context to which the interviewees belong. Due to this strategic identification of the interviewees, the selection of respondents does not represent a random sampling from the whole universe of the study; instead, it consists of a *selective or purposive sampling* (Bryman, 2012) focused on specific information to obtain with strong connection with the research question.

Conversely to other traditional anthropological qualitative research techniques, where a very few individuals are sampled, *key-informants* represent a larger group of individuals to be interviewed, all within a restrictive program of questions with focused objectives (Tremblay, 2009). According to Alan Bryman (2012), there are contrasting views on how big the size of a unit of study based on *purposive sampling* should be. Bryman records a sample unit ranging of 20 to 39 individuals as one of the smallest cases acceptable. Bryman stresses that samples should not be too small but neither so large that it is too difficult to undertake the study. The sample of this study is the largest possible that could be handled with within the timeframe of the dissertation: 30 interviewees.

RESEARCH METHODS FOR DATA ANALYSIS AND DATA INTERPRETATION

Constructivist grounded theory has been selected as the main methodological strategy for analyzing the answers of the *key-informant interviews*, interpreting the results and obtaining the theoretical standpoints to form a case or unit of study about the design of indie games. *Grounded theory* consists of the discovery and generation of theories from systematically obtained and analyzed data (Glaser, et al., 1967). It represents a strategy for the analyzing and treatment of data or information, rather than the applying of specific research methods (Charmaz, 2000). *Grounded theory* is not about reading facts; instead, it is about theoretically explaining phenomena, generating predictions and presenting relevant views around studied topics (Glaser, et al., 1967).

In *grounded theory*, theoretical explanations can be generated from different processes, either quantitative or qualitative (Glaser, et al., 1967) (Charmaz, 2000). A frequent process for *grounded theory* in social sciences is the applying of qualitative research methods for data collection, such as interviews, open-ended questionnaires and focus groups, and working with the data obtained with such activities, coding it, comparing it, finding categories, patterns, and relationships and in general making sense of the phenomena (Glaser, et al., 1967).

An important characteristic of traditional *grounded theory* approaches is that the information leads the work of the researcher and the discovery of theories takes its own course (Glaser, et al., 1967). However, through time, new formulations of *grounded theory* have surfaced; such as the *constructivist grounded theory* (Charmaz, 2000), the analytical strategy chosen for this dissertation. *Constructivist grounded theory* (Charmaz, 2000) implies that the researcher recognizes and creates the theory around the studied phenomena while interacting with the data. Instead of allowing theories to "surface and be discovered" as in classical *grounded theory* approaches, a researcher following a *constructivist grounded theory* strategy frames the study and confers meaning upon it (Charmaz, 2000).

This following of this *constructivist grounded theory* strategy for this dissertation involved working with a relatively solid body of theoretical standpoints on game design and on design theory throughout the whole research. The *key-informant interview* program was structured based on specific topics in order to match the answers of the interviewees with a series of theories. The analysis of the interview transcripts started with a predefined list of codes based on these theories. The expansion of codes, their comparison, categorization and interpretation revolved also around these theories to keep the focus of the study towards the answering of the research question and proving or disproving of the hypothesis.

Nevertheless, the research also allowed theories to surface and be discovered, as when following the traditional *grounded theory* strategy. This led to the reformulation of the theoretical framework on design theories several times in order to find the appropriate configuration for the theoretical standpoints explaining the phenomena identified through the data analysis. As well, it drove the formulation and framing of the design of indie games for the *case study comparative analysis* with game design to revolve around the similarities and discrepancies between design and art practices (Lawson, 2005); something that was discovered through the analysis of the data.

CODING AND DATA ANALYSIS FOLLOWING A CONSTRUCTIVIST GROUNDED THEORY STRATEGY

Specifically in *grounded theory*, *coding* entails several operators (Bryman, 2012) (Berg, 2001). First, data is collected, and in the case of interviews as in this dissertation, it is turned into transcripts. Second, the researcher identifies component parts of the transcripts that present theoretical significance or that appear salient within the context of study, also called *indicators* in terms of *grounded theory*. Third, codes are set to these component parts of the transcripts or *indicators* (Bryman, 2012).

The setting of codes is not done arbitrarily. With the *grounded theory* strategy, several coding approaches are possible. And since this dissertation mostly followed a *constructivist grounded theory* strategy, a *thematic analysis* was chosen as main approach (Bryman, 2012). *Thematic analysis* means that interview transcripts are analyzed based on themes resulting from theoretical standpoints previously formulated as part of the research, which provide the guidance and understanding for the managing, categorization and interpretation of the interview transcripts (Bryman, 2012). The main theoretical standpoints for the *theme analysis* have been extensively discussed in chapter 4; a summarized version of those standpoints and their implication within the coding process are presented at the end of this chapter section.

Other operators to be undertaken while coding interview transcripts consist of categorizing codes, finding patterns and commonalities among data (Bryman, 2012). The researcher

recognizes the coded components as belonging to conceptual categories, or *concepts* in terms of grounded theory. This process entails searching for recurrences and relationships in the data. The information is reduced to become manageable and interpretable. This is a making sense process revolving around the research question and the literature governed by *theoretical saturation* (Bryman, 2012). This means reaching a point where no new categories arise, establishing and validating relationships among identified categories and properly developing hierarchically-higher categories in a way that their properties and characteristics are clear as well as what differentiate them from one another.

Through the constant comparison of recurrences in the isolated categories and patterns, generalizations are established, which in turn lead to theoretical elaborations around the studied phenomenon (Berg, 2001). This is a high level process of putting forward uniformities and divergences around the studied phenomena, using abstract concepts to account for the findings in the data, and explaining such findings through existing theories (Glaser, et al., 1967). The outcome of this strategy, allowed conforming the unit of study about the design of indie games to be compared to game design (chapter 6).

COMPARATIVE CASE ANALYSIS

More than a data-gathering technique, the study of case methods is a methodological research approach (Berg, 2001). *Cases* represent units of analysis. A *case* consists of a variety of objects around which data is collected or analyzed (Bryman, 2012). A *case* is an instance of phenomena of scientific interest that the researcher investigates with the purposes of developing theoretical standpoints on the causes, similarities and differences in regard with other cases (George, et al., 2004). *Case studies* have the purpose of envisioning how the units of study operate (Berg, 2001).

For the comparative study of cases, each case is considered or treated as a whole entity of study, rather than as a collection of variables. This entails engaging in a process of interpretative analysis and concept formation to uncover patterns of invariance and divergence among cases allowing the generation of new theoretical explanations (Ragin, 1987). The operators for such analytical comparison are: describing the differences and similarities among cases, providing contextual descriptions for their understanding, establishing classifications and typologies and the explaining of these new categories or themes (Esser, et al., 2017). The comparative case analysis for this dissertation on game design and the design of indie games can be found in chapter 7.

Having defined the methodological tools and approaches of the dissertation, it is pertinent to move on to the way they were conducted. The next section depicts how big the sample of the research is, how the interviewees were selected and contacted, how the interview program was designed, as well as presents further details on the analysis and treatment of data.

SPECIFICATIONS ON THE UNDERTAKING OF THE RESEARCH METHODS

The sample for this research consisted of thirty indie designers of games. The sample is as such because constitutes the largest manageable size possible within the time frame of this

dissertation (November 2016 - August 2018). The designers of indie games were strategically selected due to their relevance in the indie games movement. They all are winners at least for one category at the festivals *Indiecade* (The IndieCade Foundation, 2018) and the *Independent Games Festival* of the *Games Developers Conference* (UBM, 2018) from 2006 until 2016. All the interviewees were responsible for the design or part of the design of their award-winning game. They all did design activities; even if in some cases they shared that responsibility with other people.

Potential indie designers to interview were identified by visiting the websites of the festivals. A list of winners from the year 2006 until the year 2016 was elaborated and the contact details of the designers were obtained from their personal websites. Since the website of the *Independent Games Festival* of the *Games Developers Conference* (UBM, 2018) does not display winners prior to the year 2013, the winners for the years 2006 to 2012 were obtained from Wikipedia (Wikipedia contributors, 2018); and these details were corroborated with articles from the game portal *Gamasutra* (UBM, 2018), with interviews with award-nominees titled "On the way to IGF". The researcher contacted all the indie designers on an individual basis via email. The email shortly introduced the purpose of the research and requested an interview based on their availability.

A structured program for the *key-informant interview* consisting of 12 main questions was developed based on notions and theoretical standpoints presented in chapter 3 on game design[54] and on chapter 4 on design theory. The same questions were part of the interview program for all the interviewees. Complementary questions were only used just in case of peculiarities on the games that could imply a particular design activity by the interviewed designer. As well, additional questions were used just in case the researcher found necessary probing answers, elaborating explanations or digging deeper around a specific topic.

The program of the *key-informant interview* is presented as follows. The table lists at the right each of the questions of the interview. At the left, the notions and theoretical concepts from chapter 3 and 4 that originated the questions are also presented.

QUESTIONS	AIM OF THE QUESTION
1. Can you take me very briefly in a journey through your work practice as game designer[55]? From zero, when you do not have even a game idea, to the idea conceptualization, the implementation, modification (balancing, skill-preparation), the testing, and prototyping.	Design activities, design process, design methods, design context, game design contributions, design actors
2. What are the different actions that you employ to get a new game concept?	Design activities, design process, design methods, design context, game design contributions
3. What processes and techniques do you employ to research or dig into a new topic or a concept on which you are just starting to work on?	Design activities, design process, design methods, design context, game design contributions
4. How do you structure, draft and assemble a game?	Design activities, design process, design methods, prototyping, building, game design contributions
5. How have you been sketching or diagramming your gameplay ideas?	Design activities, design process, design methods,

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[54] It is important to address that the questions of the interview only address the design of games, not their production. The concepts around which the questions revolve in regard game design are conceptualization, testing, prototyping, balancing and documenting, as well as game design contributions (see chapter 3).

[55] This questionnaire uses the term *game designer* because this is how the interviewed designers depict themselves.

		prototyping, game design contributions
6.	How do you balance your designs?	Design activities, design process, design methods, balancing, player

7.	How do you design for progression and skill? / How do you design the narrative of your game?
	   a. How have you integrated and dealt with luck, randomness, strategy, challenge and fun?
	   b. How have you sketched or diagramed economies?
	   c. How do you diagram the dramatic arc?
	   d. How do you do the design of levels?
		Design activities, design process, design methods, design for progression, skill and narrative, design of levels or scenes, game design contributions, player, user

8.	In what ways and in what different design stages do you test your game?	Design activities, design process, design methods and playtesting.
9.	What actions do you undertake to analyze the strengths and weaknesses of your games?	Design activities, design process, design methods and game design contributions
10.	In what different ways do you document your game details and specifications?	Design activities, design process, documenting, design methods
11.	Looking back at your projects, whom have been your projects designed for, yourself (your studio, your team) or a specific group of players? Or what could you say has been the focus of you design? What has been the king? Gameplay, the experience you want to create, or the player?	Player focus, gameplay focus, or designer focus
12.	Can you give me 5 keywords to describe your game designs? / Can you give me 5 keywords that describe yourself as game designer?	Self-portrait of the designers and their games

Table 5.2. Program of the *key-informant interview* with the designers of indie games.

Details on how the interviews were undertaken are the following:

- The interviews were conducted between December 1st 2016 and August 31st 2017[56] on *Skype*, *Google Hangouts* and *Facetime*.
- The researcher contacted the potential candidates for the interview by email and set an appointment on their convenience.
- Interviews had an average length of 60 minutes. In some cases they prolonged over 90 minutes and in other cases where about 30 minutes, due to the availability of the designers.
- Previous to the interview, the researcher undertook an extensive research on the internet about the persons being interviewed and their games. The researcher played the games of the interviewees. The researcher also read all the available articles, personal websites, blogs and other materials on which the interviewees talked about the design of their games.
- The interviewees did not know the questions before the interview.
- During the interview, the researcher introduced the research to the interviewee.
- To establish a positive rapport between the researcher and the interviewee, the researcher introduced himself, which included his educational and professional background and the rationale of the research.
- The researcher informed the interviewee that there was no right or wrong answer. The researcher mentioned that the interview was not about a specific game made by the interviewees, but rather about their repertoire of design activities[57]; but that the

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[56] Only one of the interviews had to be conducted outside of this time frame due to compromises of the designer. The interview was scheduled in the summer of 2017 and ended up taking place in November of the same year.

interviewees were free to take the conversation to any topic or game to exemplify their accounts.

- Before starting with the interview, the researcher asked the interviewees for authorization to audio record the interview.
- The interviews lasted in average about one hour. In some cases the interviewees did not feel any time pressure and enjoyed elaborating their answers, which extended a few of the interviews to up to ninety minutes. In some exceptional cases, the interviews lasted about thirty minutes; either because the answers of the interviewee were concise or because the interviewee requested that the interview lasted no longer than half an hour due to other compromises.
- The same interview program was used for all the interviewed indie designers. Even in cases that the researcher considered that a previous intervention of an interviewed designer had already answered a question. All the questions of the interview program were asked. There were few exceptions to this norm: if the interviewee had requested a short interview due to lack of time availability and one already given answer covered the topic of an upcoming question, then the question that had already been answered was skipped. The other exception oftentimes was at interviews with designers whose games were so particular that a question did not apply at all. In those situations the designers were asked the questions but then they said the question did not apply to what they did. These, however, were very seldom cases.

An overview of the analysis and treatment of the data is the following:

- The answers to the interviews were turned into transcripts.
- The interview transcripts were managed and analyzed using the software MAXQDA 2018.
- The coding of interview transcripts started with a short list of codes coming from a group of themes conforming the body of theories of the first versions of chapter 4 on design theory.
- The transcripts were read throughout and coded several times and continuous analytical comparisons among codes and among the interviews were done.
- Numerous new codes emerged through coding, thus enlarging the code list.
- The codes were categorized into concepts or themes and new hierarchically higher categories were generated.
- The coding work impacted on the rewriting of chapter 4 on design theory, which had to be reedited several times until finding the appropriate theories explaining the findings of the coded interview components.
- Memos on the coded transcripts were tracked on MAXQDA 2018 and on word processor through tables.
- The final categories on the design of indie games created were: context and traits of the design, design actors, design process, design methods and design outlooks (see chapter 6).
- The main theoretical standpoint created on the design of indie games that included all the created categories was: design style (see chapter 6).
- Visualizations encompassing several coded components of each category for the design of indie games and game design were developed based on the visualizations tools of MAXQDA 2018.
- With the aid of the visualizations on game design and the design of indie games and with the notes, memos and the theoretical frameworks written already (chapter 3, 4 and 6), the comparative case analysis was undertaken.

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[57] This is recommended by Bryan Lawson (2005) to avoid commercial speeches of the designers to sell their designs.

The final version of the themes that guided the analysis of data and the formulation of categories and theoretical standpoints around the design of indie games and also drove its comparison with game design is the following:

MAIN CATEGORY	THEMES
A. THE DESIGN PROBLEM. These concepts cast light on what is the subject of work of the designers of indie games. The goal of these themes is to provide an understanding of the context in which the design of indie games is undertaken and identify how much freedom, limitations and power of decision the designers have, in order to portray if this practice tends towards a more artistic context of creation than regular design.	1. **Nature of the design problem** The design undertaken by the indie designers is originally a setup problem to be solved or a project lacking determining constraints? 2. **Design actors and constraints** Who are the actors involved within the design undertaken by the designers of the so-called indie games? Are the indie designers working with deterministic constraints? What kind of constraints show up in their design?
B. THE DESIGN PRACTICE. Through these concepts it will be possible to envision how the designs of the indie designers arise and evolve through the development of the game. Also, considering design is the same in all the disciplines (Gregory, 1966) (Lawson, 2005), this concept will also aim at finding the particularities of design applied to the design of games. What are the main matters the designers of indie games deal with for designing? Do they turn to the use of game design elements[58] (Fullerton, 2008) or components (Järvinen, 2008) to undertake design? What do these designers do to design a game and how do they do it?	1. **Design approach towards the design problem** When and how in the development process of the game, indie designers undertake *problem-solving* (Simon, et al., 1972) (Simon, 1996) and when and how they undertake *framing* (Dorst, 2015)? When do they undertake each approach? 2. *C-K theory* **(Hatchuel, et al., 2003)** What are the logics, reasoning and design operators identifiable in the designing undertaken by the designers of indie games? Where does the final expansion of knowledge take place leading to the obtainment of the design? Are there several final expansions of knowledge or just a single one in the process undertaken by the designers?
C. FREQUENT AND COMMON DESIGN HABITS WITHIN INDIE CULTURES. By identifying guiding principles and frequent design actions of the designers of indie games, it will be possible to find out what is the style that constitutes part of their identity as a cultural movement, what makes indie game makers indie by their design actions.	1. **Guiding principles or design style** What are the most common design patterns, styles and habits identified in the design undertaken by the designers of indie games?
D. DESIGN METHODS OR STRUCTURED AND PROCEDURE-ALIKE DESIGN ACTIVITIES. By looking to the use of design methods, it will be possible to envision how the designers of indie games aid themselves through the application of preexisting design constructs and how formalized are the procedures these designers follow in their practice.	1. **Design methods** What are the design methods applied by the designers of indie games?

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[58] An overview on these terms from game design is presented in the previous chapter of this dissertation.

SIMILAR RESEARCH METHODS APPLICATIONS IN GAME STUDIES

Several applications of the research methods and methodological strategies of this dissertation exist within game studies. A couple of examples of case study researches are the dissertations of Ashley Brown and Suellen Adams. Brown explored a style of play in *Word of Warcraft* (2004) defined as erotic-play and treated each of the players who participated in her study as cases of analysis (Brown, 2013). Adams established as her unit of analysis the multiplayer role playing game *City of Heroes* (2004) aiming at understanding how cultures are formed in virtual spaces (Adams, 2006).

An example of a research that implied the undertaking of interviews is Tom Boellstorff's anthropological work on the virtual world *Second Life* (2003). Boellstorff (2008) interviewed dwellers of the platform and found out humans take notions from their life such as gender, sex, conflicts, money, group and self-identify, among others, into the virtual. Jesper Juul (2009) also applied interviews with players in his research on how games and their audiences evolve. Juul found out that the player's life events have an impact on gaming habits and gaming tastes.

Grounded theory is a strategy oftentimes visible in game studies research dealing with interviewing people. Sebastian Deterding (Deterding, 2016) interviewed players in order to reach an understanding on their autonomy and engagement while playing for leisure and when playing for work, including when they play serious games or participate in gamified activities. Darrin F. Coe (2017) interviewed players of table-top role-playing games and non-players in order to understand motivations for playing. And Marta Beranuy, Xavier Carbonell and Mark D. Griffiths (2013) interviewed players on treatment for game addiction with the aim of finding out their reasons for their game dependency; the findings show dissociation, entertainment and virtual friendship as the factors for such a phenomenon.

As for comparative case analyses, exemplars are works by Andreas Tyschen (2006) and the collaborative work by Damien Djaouti, Julian Alvarez, Jean-Pierre Jessel (2010). The former consists on a comparison between pen and paper role-playing games and computer role-playing games revolving around their limitations and affordances due to their formats (Tyschen, 2006). The latter compares tools for game creation in order to find out if by the use of a specific tool, people who are not designers such as teachers, therapists and other professionals can create their own serious games (Djaouti, et al., 2010).

CONCLUSION

The methodological approaches and strategies for the dissertation have been presented in this chapter. Next, chapter 6 will present the categories and theoretical standpoints generated with the purpose of formulating the case or unit of study for the design of indie games. Chapter 7 will present the comparison of both cases, game design and the design of indie games with the aim of answering the research question and proving or disproving the hypothesis.

CHAPTER 6: AN X-RAY TO THE DESIGN OF THE SO-CALLED INDIE GAMES

> *"We're going to do this; this game, this time. We're going to double down and make it very much our expression. This is our album; this is our poem; this is our expression; and that was the decision that we intentionally made. And I think everybody just needs to sort of be honest with themselves about what they're making, and from there, any choice you make is ok"* – Brent Calhoun (Super Chop Games), 31.01.2017

Imagine the design of a car: in commercial contexts, a car manufacturer would identify needs to fulfill from a specific group of drivers. Based on these needs, the manufacturer would call in car designers to design the car. The car designers would aim at meeting the specifications of the manufacturer and would design the car having the driver's needs and expectations as main focus of the design. The car designers would conceptualize the car by compositing different elements that in synergy integrate the car. After such an activity, the designers would prototype and test the car, and once getting the design approved, the car would be produced in the assembly line to then be tuned and polished.

The design of the car would be described for best results in car design literature. In the field of games, this literature would equate to game design as presented in chapter 3 of this dissertation. How would be like the design of a car in analogy with the design of indie games? Would the design of the car still have the driver as main focus? Would the car designers design the cars in order to meet other people's rigid specifications and needs? Would the car be designed first and then be shipped to production? How would the design of this car differ from the car design from the literature?

This chapter consists of the results of this research. It covers the information that will allow comprehending what is the design of indie games like. It presents the analysis and interpretation of the data obtained through the interviews[59] conducted with thirty award-winning indie designers, in order to answer the research question of this dissertation: based on the design undertaken by the designers of the so-called indie games, does the design of indie games constitute a different paradigm compared to game design?

The structure of the text is the following: first, the context that originates the design of indie games will be introduced. It will be depicted if the designers start the design of their games working on a project to be solved (Dorst, 2015) (Lawson, 2005) or as a project without decisive constraints (Hatchuel, 2002), if their designing is either something personal or focused on what is functional in the market; if the designers work with or without objectives and goals and if the player is or not the reason and focus of the designs. These notions will share light on whether what the interviewed designers do likens more the practice of designers or the practice of artists.

This chapter will also cover the design actors that intervene in the design of indie games, designer, player, and publisher, and their relevance. This has the purpose of reaching an understanding around who is who within the design of indie games, who is the most important actor around which the design of indie games revolves and to which extent each actor imposes or confers constraints or specifications. Then, the design processes of the different interviewed designers will be depicted paying attention to the different actions they undertake, the elements used to design games with, the approaches from which the designers design,

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[59] The program of the interview is presented in chapter 5 on the methodology of the research.

problem solving (Simon, et al., 1972) (Simon, 1996) and *framing* (Dorst, 2015), the moment at which the design becomes known and visible to the designer, and how all these elements shape what can be considered as the characteristic design style within indie games.

Finally, in order to get an overview on how heuristic or structured the design of indie games can be, the chapter will feature the design methods applied by the interviewed designers of indie games. This will be followed by several outlooks and opinions with which the designers design their games. This to grasp why the designers undertake design the way they do and what beliefs influence their design practices.

The results of the research are presented synoptically, in the form of condensed tables and visualizations encompassing simultaneously several of the theoretical views discussed in chapter 4 on design theory. Each of the tables presented will include game design as depicted in chapter 3 to favor the comparison between the construct that game design represents and the results obtained through this research by interviewing designers of indie games.

The results and concepts of this chapter aim at portraying the design repertoire of the interviewed designers of indie games. Except for those designers who only have made a single game or those who preferred focusing in their accounts on a specific game, the results depict a wide range of situations in which the designers have engaged with for the design of their works. The findings presented in this text represent temporal portraits of the design undertaken by a group of award-winning designers of indie games. So, even if in the future the interviewed designers varied their design activities or collaborated with different actors in their design practice, the information these designers have already provided is useful enough to define the current state of the design of indie games.

SELF-PORTRAITS OF THE INDIE DESIGNERS

Before digging into the findings about the design of indie games, this chapter will provide an overview of the thirty designers who participated in this research. The aim is to introduce the interviewees with a particular focus on how they portray themselves and their own games. The following table (4.1) includes their names, the games they were awarded for, the festival at which the game was awarded, and finally the keywords the participants used to describe their own repertoire of games as well as themselves as designers.

Table 6.1. The designers of indie games who participated in this research.

DESIGNER	GAME	FESTIVAL	KEYWORD - GAMES	KEYWORDS - DESIGNER
Game design	*Mainstream industry games*	*-----*	*-----*	*player-focused, rigid-constraints dependent, staged and structured*
Daniel Benmergui	Today I die (2010)	Indiecade	*"small, crafted, colorful, ingenious, likeable"*	*"South American, with temper, cynical, anxious, fearful"*
AP Thomson (Hexecutable)	Beglitched (2016)	IGF	*"pretend to be tactical, mechanically and narratively integrated, try to be single player, isometric between the player and the computer, for a very simple AI , loose (not a very tight single solution to every puzzle), intersection of*	*"digital designer, quick iterating , jack-of-all-trades, concept-soup (too many different ideas integrated), procedural"*

			magic and technology"	
Alina Constantin (Tiny Red Camel)	Shrug Island (2018)	Indiecade	*"expressive or evocative, visual, narrative, activist (designed with a purpose)"*	*""novice, aesthetic, storyteller, attentive to my audience, (I do want to make games for players more than for myself), conceptual"*
Jim McGinley (Big Pants)	The Depths to which I sink (2008 - 2011)	Indiecade	*"unique, arcade, funny, art, like art games"*	*"programmer, crafter /craftsman, trying-to-do-something-different, not an artist, not in it for the money"*
Auriea (Tales of Tales)	Luxoria Superbia (2013)	Indiecade	*"real time, virtual, creatures, life, love"*	*"difficult, not-games, open but traditional, avant-garde"*
Jason Roberts	Gorogoa (2018)	IGF	*"beautiful, mysterious, intricate, magical, delightful"*	*"visual, intuitive, inefficient, exploratory, slow"*
Patrick Smith (Vectorpark)	Metamorphabet (2015)	IGF	*"interesting, surprising, beautiful"*	*"patient, thoughtful, brave"*
Terry Cavanagh	VVVVVV (2010)	Indiecade	*"personal, fun, uncompromising, minimal, approachable"*	*"focused, noncommercial, not in games that are to please or are accessible to the audience, cryptic, explorer or inaccessible"*
Logan Olson (Hard Light Labs)	Soundstage (2016)	Indiecade	*"music and VR, instruments, sandbox,DJ"*	*"jack-of-all trades, experienced designer, rapid prototyper, interaction designer"*
Brendon Chung (Blendo Games)	Quadrilateral Cowboy (2016)	IGF	*"small, intimate, funny, weird, colorful"*	*"Iterative, fast, artistic, understated, I'm a sponge"*
Ditto	GoNNER (2016)	IGF	*"feedback, juice, colors, mechanics, action"*	*"motivation-driven, stealer, appropriator, impostor, pretentious"*
Andy Schatz (Pocketwatch Games)	Monaco (2016)	IGF	*"complex systems simple controls, compelling narrative, light-hearted"*	*"passionate, iterative, organized, well-research, and communicative"*
Erik Svedang	Blueberry Garden (2009)	IGF	*"games as scientific experiments, interactive storytelling, hand-made, duality between one-single story game and hard core two player games"*	*"making very different games, bearer of many hats, jack-of–all-trades, scientists"*
Ed Key (Twisted Tree Games)	Proteus (2013)	Indiecade	*"exploration, atmospheric, discovery, non-compassity, imagine"*	*"exploration"*
Nathalie Lawhead (Alienmelon)	Tetrageddon (2015)	IGF	*"surrealists, weird, strange, different"*	*"absurdous, weird, different, funny, strange"*
Nina Freeman (Star Maid Games)	Cybele (2015)	IGF	*"embodiment, portrait, character-focused, detailed"*	*"messy, personal, concise, fast, learning through research, research-oriented"*
Lucas Pope	Papers Please (2013)	IGF	*"simple, boring, short, story, and great"*	*"lucky, old, boring, handsome"*
Justin Ma (Subset Games)	FTL (2012)	IGF	*"high risk, high reward, consequence, learning, challenge, unforgiving ,*	*"iteration, fluidity, self-gratification, fun, challenge"*

			experiences"	
Douglas[60] Wilson (Die Gute Fabrik)	B.U.T.T.O.N. (2011) Johan Sebastian Joust (2014)	IGF	*"music and audio, taking old existing forms of adventure games and try to take them in an interesting new direction, physical digital games,"*	---
Ezra White Hanson (XRA)	Memory of a Broken Dimension (2018)	Indiecade	*"mysterious, unforgiving, stillness"*	*"stubborn, obsessive, explorer, reserved"*
Matt Meyer and Brent Calhoun (Super Chop Games)	Ephemerid (Meyer, 2015)	Indiecade	*"feeling, music, different, flow, connection, journey"*	*"obsessive, perfectionist, open, reckless, optimistic, satisfied"*
Tom Sennett	Deepak Fights Robots (2011)	Indiecade	*"funny, friendly, simple, layered and punk-rock"*	*"stubborn, efficient, manic, and lazy"*
Richard Boeser (Sparpweed)	ibb and obb (2013)	Indiecade	*"original, minimal, timeless, not so trend-driven, not time-specific, naive, stubborn, personal, experimental, joyful"*	*"stubborn, perfectionist, patient, analytical, positive"*
Eddy Boxerman (Hemisphere Games)	Osmos (2009)	IGF	*"balanced, universal, natural philosophy, natural philosophy / science, games for both sides of your brain, balance, appealing to your logical systemic thinking and aesthetic and emotional senses, emergence, elegant, simplicity and beauty"*	*"balanced, philosophical, critical, slow"*
Anders Gustafsson (Cockroach Inc.)	The Dream Machine (2010)	Indiecade	*"narrative, observational, trippy"*	*"subconscious, playful, devious"*
James Earl Cox III (Seemingly Pointless)	You Must Be 18 or Older to Enter (2015)	Indiecade	*"short, alternative, critical, experimental, concise"*	*"fast, thorough, spontaneous, thoughtful, subversive"*
Danny Day (QCF)	Desktop Dungeons (2010)	IGF	*"argumentative, focused on observation and feedback"*	*"long term outcome-focused, defining failure points as possible, I remember stuff"*
David Kanaga	Oikospiel Book 1 (2017)	IGF	*"music, opera, eco, economy, ecology, flux, adventure"*	*"music, opera, flux, nonverbal, non-rational but also rational"*
Felix Bohtasch (Broken Rules)	Old Man's Journey (2017)	Indiecade	*"contained-focused experiences, focused on 2 or 3 things but not on more, 2D, art-style, aesthetics"*	*"very close to the playable form, very iterative"*
Alistair Aitchenson	Codex Bash (2015) The Incredible Playable Show (2015)	Indiecade	*"physical, performative, multiplayer, alt-controller, player-expression"*	*"improvisational, experimental, qualitative feedback, comedic, phenomenological"*

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[60] Douglas Wilson chose not to provide keywords to describe himself as a designer.

GETTING IMMERSED INTO THE DESIGN OF INDIE GAMES

Back to the car design example, picture the designers of the car structuring the context of the design based on their likes, interests and hobbies; instead of a scenario where a car manufacturer gives specifications to the car designer in order to meet the market's needs. Imagine the car designers designing the type of car that is personal to them and imposing to themselves the objectives they want to achieve. Imagine also that some of the car designers engage in the design of the car without having a concrete goal and trying out unrestrictedly numerous possibilities and freely deciding when the design ends.

Even though the cars are not designed for a specific group of drivers, these car designers make their cars accessible to drivers and turn to these users to verify that the cars can be used, to validate the design of the cars. Oftentimes, these car designers also design cars with other car designers, who impose their vision on how to conduct the design too. And very occasionally, the car designers take specifications from other actors for the design of the car. For instance, sometimes car designers participate at a design event where they are given a theme or word to inspire the design of a car. From time to time, car designers adjust their designs in order to get funding from institutions; and other times a few car designers also get commissioned or get contract work from a client who wants a specific car for a special kind of driver.

This scenario for the design of the car and what car designers do is presented as an analogy to depict the context, traits and actors that intervene in the design of indie games; notions that will be now explained based on the findings of this research.

CONTEXT AND TRAITS OF THE DESIGN OF INDIE GAMES

> *"Papers Please is a really personal project for me, because, I had no idea when I started that other people would want to be checking documents… So, I didn't sit down and say, 'well, I'm gonna make a game for the people who like to check documents'. It was just 'I'm gonna make a game that is interesting for myself and a game that I would like to see because there are no other games like this out there'. That's kind of an important part of choosing a game idea, is, how unique is it; how much can it stand on its own without being compared to other games. So, I'm not trying to hit a particular market, it's just what I think could be interesting"* – Lucas Pope, 3.04.2017

The results show that the interviewed designers of indie games work on personal projects without decisive constraints structured by themselves. Just few of the interviewed designers work on problems to be solved for other people. The designers also work on projects that imply voluntarily-taking constraints from other actors, such as game jams and funding calls. Moreover, designers mostly design with an objective or goal in mind, but some of them also occasionally design without a specific aim. And except for those few designers taking contract design work or being commissioned, the designers do not have the player as the reason behind their design practice; the player is instead a validator of the design.

Table 4.2 presents two main categories: the initial context for the design of games and traits of the design process. Initial context for the design of indie games depicts whether the designers deal with problems needing to be solved (Dorst, 2015) (Lawson, 2005), or with projects without decisive or rigid constraints (Hatchuel, 2002); these two concepts are presented in function of

Table 6.2. Design context and traits of the design of the interviewed indie designers.

DESIGNERS \ CONCEPTS	Rigid constraints	Flexible constraints	Voluntarily-accepted external rigid constraints (e.g. festival, contest, funding opportunities)	Voluntarily-accepted external flexible constraints (e.g. Game Jam, academic project)	Self- or collaboratively-structured situation (e.g. "making the game I want to make")	Objective and constraint driven	Relatively objective and goal-free	Relates to a target group or market	Represents what is personal for the designer	Originating or influencing the design	Verifies the design
GAME DESIGN	X	X				X		X		X	X
Daniel Benmergui					X	X	X		X		X
AP Thomson (Hexecutable)				X	X	X			X		X
Alina Constantin (Tiny Red Camel)	X	X		X	X	X		X	X	X	X
Jim McGinley (Big Pants)			X		X	X			X		X
Auriea (Tales of Tales)			X		X	X			X		X
Jason Roberts					X	X			X		X
Patrick Smith (Vectorpark)					X		X		X		X
Terry Cavanagh				X	X	X	X		X		X
Logan Olson (Hard Light Labs)					X	X		X			X
Brendon Chung (Blendo Games)					X	X	X		X		X
Ditto				X	X	X			X		X
Andy Schatz (Pocketwatch Games)					X	X		X	X		X
Erik Svedang				X	X	X			X		X

Column groupings:
- **INITIAL CONTEXT FOR THE DESIGN OF THE GAMES** — Motivation
  - Extrinsic: Problem to solve for other actors (Rigid constraints, Flexible constraints)
  - Intrinsic: Special projects (Voluntarily-accepted external rigid constraints; Voluntarily-accepted external flexible constraints); Project without relatively determining constraints (Self- or collaboratively-structured situation)
- **TRAITS OF THE DESIGN PROCESS OF INDIE GAMES**
  - Goal-orientation versus open-endedness (Objective and constraint driven; Relatively objective and goal-free)
  - Functionality versus what is personal (Relates to a target group or market; Represents what is personal for the designer)
  - Player's role in the design process (Originating or influencing the design; Verifies the design)

DESIGNERS \ CONCEPTS	Problem to solve		Special projects		Project without determining constraints	Goal-orientation VS. exploration		Functionality VS. what is personal		Player's role in the design process	
	Rigid constraints	Flexible constraints	Voluntarily-accepted external rigid constraints (e.g. festival, contest, funding opportunities)	Voluntarily accepted external flexible constraints (e.g. Game Jam, academic project)	Self- or collaboratively-structured situation (e.g. "making the game I want to make")	Objective and constraint driven	Relatively objective and goal-free	Relates to a target group or market	Represents what is personal for the designer	Originating or influencing the design	Verifies the design
GAME DESIGN	X	X				X		X		X	X
Ed Key (Twisted Tree Games)					X	X			X		X
Nathalie Lawhead (Alienmelon)					X	X			X		X
Nina Freeman (Star Maid Games)				X	X	X			X		X
Lucas Pope					X	X			X		X
Justin Ma (Subset Games)					X	X			X		X
Douglas Wilson (Die Gute Fabrik)			X	X	X	X			X		X
XRA (Ezra White Hanson)					X	X			X		X
Matt Meyer and Brent Calhoun (Super Chop Games)					X	X			X		X
Tom Sennett					X	X			X		X
Richard Boeser (Sparpweed)					X	X			X		X
Eddy Boxerman (Hemisphere Games)					X	X			X		X
Anders Gustafsson (Cockroach Inc.)					X	X			X		X
James Earl Cox III (Seemingly Pointless)				X	X	X			X		X
Danny Day (QCF)	X	X		X	X	X		X	X	X	X
David Kanaga					X	X	X		X		X
Broken Rules - Felix Bohtasch		X	X	X	X	X			X		X
Alistair Aitchenson					X	X		X	X		X

what they represent to the designers motivation-wise. On the one hand, problems to be solved are depicted as extrinsic to the designer because they are generated based on the needs of other design actors, and in this case the designer is asked to find a design solution. These other actors confer rigid and flexible constraints to the designers.

On the other hand, the projects without decisive or rigid constraints are depicted in the table as intrinsic. It was found through the interviews analysis that the situations designers deal with derive from the designers' initiative. These are cases with flexible but voluntarily accepted constraints that inspire or suggest something for the design, such as Game Jam topics and festivals, contests and funding conditions. As well, these projects are self-structured or collaboratively-structured situations that lack decisive constraints and can take any direction. These are games designed for personal reasons; such as when the designers make the kinds of games they like, or when they want to explore themes or games as a medium to fulfill artistic and expressive needs, among other reasons.

> *"I do have ideas and things I want to say with them. How would it be, like, if you try to play with people's heads and, how do hares make people feel? What do hares mean to me? There is philosophy behind the stuff. It's interesting too, 'cos when other people pick it up and write about it or analyze this, then, I start seeing from their point of view or forget what I saw in it the first place. So, I do have philosophies but it's, I don't really hold on to them… For me it's a lot exploring someway being interactive or making something interactive. So, it's kind of also satisfying a curiosity that I have, like, how would this be like, how it would be like if you had hares screaming at a person all the time, would they go crazy? You know, kind of satisfying some curiosity"* – Nathalie Lawhead (Alien Mellon), 31.01.2017

> *"So, Subset being primarily Matt and I, started from nothing. We would work, just come up with a list of very vague ideas of what something might be fun; very broad concepts. And then, pretty much arbitrarily pick one that we may both like a little bit, and then iterate on creating something that is super bare bones, minimal and then try to find out what is fun about that mechanics"* – Justin Ma (Subset Games), 2.02.2017

The second top category of table 4.2 is traits of the design process of indie games. This category subdivides in three subthemes: goal orientation versus open-endedness, functionality versus what is personal to the designer and the player's role in the design process. This top category and its subthemes revolve around the differences discussed in chapter 4 between designers and artists: where designers relate their practice and creations to the needs of target groups of people and stakeholders and work focused towards reaching a specific goal or end; while artists work with less requirements, navigate with freedom in their practice and produce what is for them personal (Lawson, 2005) (Lawson, et al., 2009).

The subtheme goal orientation versus open-endedness portrays two alternatives for the design of games: a design that is objective and constraint driven, where there is a clear direction guiding the design process, and a relatively objective and constraint free design, in which designers continuously try out things without having specified what they want to reach. The subtheme functionality versus what is personal profiles the design of games as focusing on responding to the needs of a specific target group of people or market and as representing what is personal to the designer of games. And the subtheme player's role presents as alternatives the case in which the player is the reason for the design of the game, thus originating and inspiring the design process, as well as the case in which the player verifies the output of the design process.

The results of this research in Table 4.2 feature game design at top of the list of participants. Game design, as depicted in chapter 3 of this dissertation, has the following characteristics: from the point of view of the designer it is motivation-wise extrinsic; it is structured as a problem needing to be solved by other design actors who are not the designer and who confer rigid and flexible constraints to the designer's activities; game design is functional, implying it relates to a target group of people and stakeholders; the player is the reason behind the design of the game, the player originates and is the focus of the design undertaken by the designer, and the player verifies and validates the output of the design work. In other words, game design is not a project without determining constraints driven by the internal motivation of the designers, nor is a goal-free design process where the designers can do what is personal to them nor is a design activity where the player is not the main focus.

The results in table 4.2 show that all the designers of indie games interviewed for this research engage in design contexts that constitute self- structured or collaboratively-structured situations. These design contexts come from the internal motivations and represent projects without determining constraints, such as making games of the interest or like of the designers. A few of the interviewed designers have also engaged in projects with rigid and flexible constraints coming from other external entities that they have voluntarily accepted, such as festivals, contests, funding opportunities, as well as Game Jams. These designers are Alex Thomson (Hexecutable), Alina Constantin (Tiny Red Camel), Jim McGinley (Big Pants), Tale of Tales, Terry Cavanagh , Ditto, Erik Svedang, Nina Freeman, Douglas Wilson, James Earl Cox III, Danny Day and Felix Bohtasch (Broken Rul.es). A few designers also have engaged in problems to solve for externals; they have taken contract work or have been commissioned or requested by an external party to design a game with specific characteristics. These designers are Alina Constantin (Tiny Red Camel), Nina Freeman, Felix Bohtasch (Broken Rules) and Danny Day (QFC).

> *"I recently participated in the Zero Hour Game Jam, which is make a game when the clock goes back in Europe, so you start at 1.00 am and then an hour later it is still 1:00 am because the clock is come back, and you are supposed to have made a game in that hour. And for that one, I had actually no idea what I wanted to go into it; but I just thought some basic restrictions that is like, 'ok, I want to be able to make this in an hour. So, I have to have certain scope and not gonna have anything that happens in more than one screen; and I'm gonna keep the interaction simple so probably do like simple action game interactions'. ..I just started working on this forest thing that I was thinking about and then I had a bunch of random trees and houses and rocks and stuff, and from there then I had like a starting point that inspired some other stuff, like, what the character might be, what it might do in the game and yeah, so, just finally start from somewhere and I keep iterating on that until that makes sense"* – Terry Cavanagh, 17.11.2017

> *"I always kind of, like, not to think of game design, not as solving problems, but as giving other people problems that are fun to solve… I tend to enjoy building stuff and enjoy watching other people play stuff I've made; that's more fun for me. So, probably that's why my practices focus much on feedback, because I'm doing the thing I enjoy; I'm watching somebody play a thing that I've made, you know, that's the fun of it. It can get tedious eventually, but that's what I do. So I always focus on the interaction between the game and the player, and the core element there is the player, 'cos the games can change all the time"* - Danny Day (QFC), 16.03.2017

Regarding the traits of the design process of indie games, results show that all the interviewed designers have had a specific objective while designing their games or have conducted their design practice around a specific goal, limitation or boundary they have imposed to themselves. A few of the interviewed designers, however, have also in a few situations designed games without setting an objective or a goal; they have designed freely without knowing what they were working on, without knowing what the design would lead to and without having expectations of an end to

their design. These designers are Daniel Benmergui, Patrick Smith (Vectorpark), Terry Cavanagh, Brendon Chung (Blendo Games) and David Kanaga.

> *"'Today I die' started in my head with the image of the girl sinking in the water and later on coming out of the water. It started as the image for the beginning of the game and the image for the end of the game. Then I sit down and when I start formulating that idea, other ideas that I had not thought also pop up. Then, when I start pursuing those other ideas they lead me to places I had not thought of. Basically, my criteria to filter each decision I take is to take the road representing the most minimal resistance towards what the game itself wants to be. I implement an idea and I test it. If I keep it or not depends on how it fits the current game. If the result is better I keep it; if it is worse it is discarded, or I just let it be for a while, until it settles down in my head what is the game about. Once this happens I start getting rid of all the things that do not fit the new concept of the game and complete things I feel are missing"* – Daniel Benmergui, 30.01.2017

Results also show that all the interviewed designers have designed what is personal to them rather than focusing on responding to the needs of a specific target group of people. Just very few of the interviewed designers have also engaged in designing what implied focusing on the needs of a specific target group. These designers are Alina Constantin (Tiny Red Camel) and Danny Day, who have taken commissioned design work for other people. Special cases are Logan Olson (Hard Light Labs), who saw in the virtual reality market a commercial opportunity and based on it worked on developing *Soundstage*, and Andy Schatz, who, despite designing games that deal with his hobbies and interests, caters for special player styles and player profiles. A very particular case is Alistair Aitchenson, who designs experiences to be played at game festivals about which what happens outside the screen with the players and with an audience is what the games are really about.

> *"In some ways I am designing these games for me, in that they are things that I like and things that are interesting for me to explore and it centers on the design process that I enjoy. But on the other hand, I am also making them for the venue these days. I'm making them with the idea that, within this space, this thing will work, these things won't work. Within the space, visitors are going to have these expectations; they're going to expect to play this period of time; there's going to be, you know, other distractions… But on the other hand I always have the eyes not necessarily on the players as an audience, but on who is between me and the players as the audience"* – Alistair Aitchenson[61], 18.12.2016

> *"… but so often you try to do work that is relevant to your peer group or to the culture at large. So, for us with motion control, we felt like commercial motion control games weren't, like, were missing some important things about how to use these controllers and how to design physical play; so, that we could take this intervention in game development by kind of showing this other approach to design physical videogames. So, I'm not sure there was ever like a player type or something that I had in mind, but you're immersed in a culture, in a scene, like an art scene or something, so that definitely informs your work. I would say, it wasn't necessarily just for myself, oftentimes that was for me and friends trying to make each other laugh"* – Douglas Wilson (Die gute Fabrik and Copenhagen Game Collective), 19.08.2017

> *"I wanted to build something that was more of a playful creative tool. And then on top of that I wanted to make sure I was doing something that I haven't seen released in the market yet. So, if you're not doing virtual reality, and you're doing more traditional desktop, or mobile games, it's a fairly saturated market… by and large, most of the low hanging fruit has been picked. But VR, like, I was fortune enough to get in there at the time when there's a lot of green filed yet to be explored. So, it was important for me that I was exploring something that was already in process, 'cos that gives you better chance that your product being seen by users or players"* – Logan Olson (Hard Light Labs), 21.07.2017

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[61] Chapter 2 discusses how indie games represent scenarios for expression and creativity and presents *The Incredible Playable Show* (2016) by Alistair Aitcheson as an example of games that are performative. Players interact with the software and hardware such as controllers, toys or other random objects, while there is also an audience participating in the situation as one of the most important elements of the game experience.

The design undertaken by the interviewed designers confers the player the role of verifying and validating the games yielded by the design work, instead of having the player as the reason that originates the design. Exceptions to these cases are Alina Constantin (Tiny Red Camel) and Danny Day, who have taken contract work or have been commissioned to make games for a specific group of people.

> *"The very first thing I try to understand is the intention, if it is a game that I am making for myself it can sometimes be easier. But what is the intention sort of. What is the experience supposed to express, and how is it supposed to feel for the player, what is the expected player experience, and how is the player expected to change, in a way"* - Alina Constantin (Tiny Red Camel), 20.04.2017

> *"These days I tend to be a little more focused, so I would pass my ideas to people that I think are good in the market that I'm aiming for, or if I'm working for a client I would have like a target market that they would have specified. And I would try to find the way to test an idea with that target market to see if it works for what they're trying to achieve. And because they've listed their goals then I would have an opportunity to test the prototype against those goals"* – Danny Day (QFC), 16.03.2017

> *"We assumed we're making it for everyone and then later we find out we're wrong or something; we find out who it was for. And that's often kind of news to us and kind of fun, ´cos we're not, that's not our talent. Our talent is not in designing for specific group of people. We didn't think that the Endless Forest was gonna appeal to anybody, at all; and then it turned out to appeal to, like, women for a while, and then it was, like, children, and then it was, like, Russian children, and then it was Japanese children, and then it was, like, you know, young adults, and then, there is a whole community of extremely creative young adults and we couldn't plan it. I mean, The Path, we specifically made for like teenagers, 15 and up, because, we figure, well, we don't want anyone younger than that; anyone younger than that isn't gonna get it: But you know, we don't know who that was for. I mean, and especially something in the later games, like Sunset, I mean, Viante Latte, who was that for? I don't know; we made it ´cos we wanted to. I think we have two different classes of games most of the time, where, some were made, three, some were made because there was an occasion, like, Pronitas. It was made for our history of games festival, or whatever. And Luck was made for the Milan Triennale. And there we have games that we've made specifically to be popular, like, The Path and Sunset, to some extent. Endless Forest turned out to be that but we didn't know, and then we have games that we made strictly for ourselves. Yeah; so, you have Petal, Viante Latte; those were very personal, and even to some extent Luxurious Superbia, made just because we wanted to and didn't care. You know, so, it's like, most of the time they were made for other people. So, The Path, I think, it's a very giving instance when we were, like, " we're making this for you" and Sunset too, "we're making this for you, you know"* – Auriea (Tales of Tales), 7.06.2017

DESIGN ACTORS IN INDIE GAMES

> *"So, I try to make myself happy, but I'm also trying to divorce myself from my knowledge, from this game and how it works; if that makes sense. What I think I don't really do, I don't try to appeal to people that want something different out of a game than I do. There's certain aspects of games that are popular at the moment, what the people always like that I just don't care about. So, I just don't do them. It's important to me because otherwise I think you're not really making anything, I don't know, I don't think that's a good way for an artist to be"* – Patrick Smith (Vectorpark), 3.02.2017

Chapter 4 discussed Bryan Lawson's theoretical standpoint (2005) on the actors in design and how each of these actors imposes fixed and flexible constraints to the design. Among interviewed designers of the so-called indie games, the findings of the research depict a different structure for Lawson's model of design actors. Results show additional actors and a distinct relevance for each of these actors within the design of indie games (see figure 6.3).

ACTORS IN GAME DESIGN   ACTORS IN THE DESIGN OF INDIE GAMES
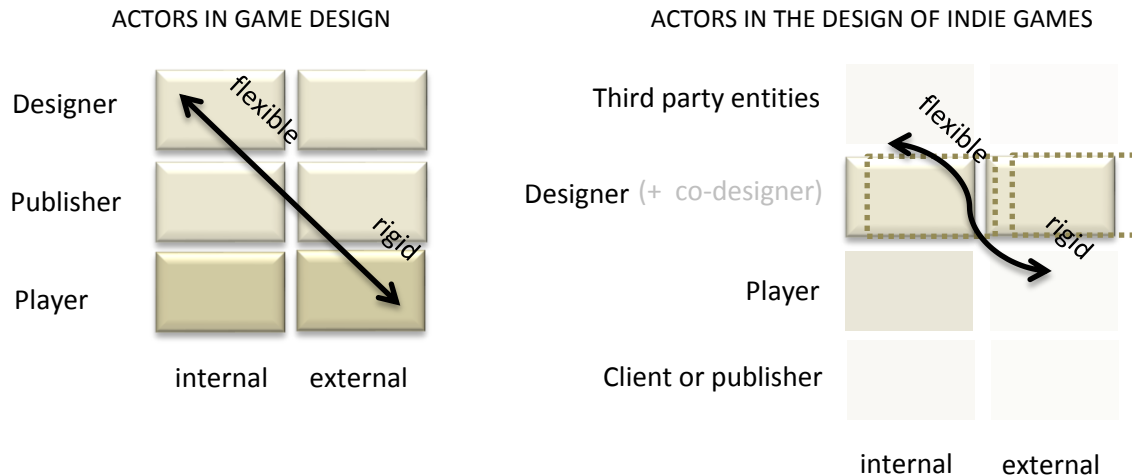
Figure 6.3. Comparison of actors between game design and the design of indie games.

Game design, as presented in chapter 3, fits the model of actors and constraints as depicted by Bryan Lawson (2005). The actors of the model, client, user and designer, correspond in game design to publisher, player and the designer of the game, respectively. Game design aims at meeting specifications provided by a publisher and appeals to and revolves around the demographics of a group of players. Due to these factors, the designer has to deal with fixed and rigid constraints from the publishers and players, besides the designer's own constraints. Moreover, since game design advocates for a player-focused design of games (Fullerton, 2008), the player becomes the most important of all the intervening actors.

Within the design of indie games, **the designer is the most important actor**. Designers of indie games define what games they design and how they undertake the design. They also set limits or priorities to themselves within their design practice as well as identify what their skills, knowledge and possibilities allows them to accomplish. Thus, they deal with their own flexible and rigid constraints. Moreover, designers design what is for them personal, what interests them and what fulfills their expressive needs. Indie designers of games have also in the context of their practice versatile roles; they are freelancers, consultants, part of a bigger team, members of a collective or one-person studios, either doing all the development by themselves or commissioning parts of the work to other people. All these different responsibilities and modes of working impact on the way their design is undertaken.

An additional actor interplaying with the designer in the design of indie games is the **co-designer**. This actor does not represent co-workers or other members of the developing team. The co-designer is instead an external individual also designing the game, contributing with ideas and also working with and setting flexible and rigid constraints. The co-designer is a co-creator, just as the designer; and several of the interviewees referred to this actor as "collaborator". The interviewed designers that mentioned co-designers in their practice are: Alex Thomson (Hexecutable), Ditto, Ed Key, Nina Freeman, Douglas Wilson, Tom Senett, Richard Boeser (Sparpweed), James Earl Cox III (Seemingly Pointless), Eddy Boxerman (Hemisphere Games) and David Kanaga.

> *"It's like finding out, intuitively, finding out, somebody; you like their work; and finding out where's the magic point where you both are into this"* – Ed Key, 19.01.2017

"In the case I work with one other person, we let it evolve without actually knowing how big the project will be, and we take it from time to time to figure out, 'ok, this is bigger than we thought it would be; should we continue? We need more people on the project; is that even possible?'" – Richard Boeser (Sparpweed), 21.06.2017

The player is also a relevant actor among the interviewed designers of indie games. However, in contrast to game design, the player is more a validator than a target and a well-defined user. Except for a very few cases where some designers take contract jobs, the player is not the cause of the design, the player does not originate or inspire the design of the games. Instead, the player verifies the outputs of the design; players validate the games designed by the designers. Designers deal with constraints from players while making their very personal designs accessible and understandable to other people by getting feedback via email or directly by observing people play at festivals or conference booths. The player, however, does not tend to represent a specific group of people; the player is rather an unknown mass of individuals who can feel identified with and be potentially attracted by the designs made by the designers of indie games.

"My games, they're gonna be, you know, played by a very small audience; so, I'm not gonna spend too much energy kind of making it playable for everyone" – Brendon Chung (Blendo Games), 21.03.2017

"I'm trying to create something that I would enjoy. If I enjoy it, then I start showing it to other people, and if they enjoy it too, then I'm on to something. If only I enjoy it, it stays as a prototype forever. If I enjoy it and other people enjoy it then I would do the work to try to turn it into full game that I'd release. But I am the first filter, friends the second filter and the rest of the world the third big filter" – Eddy Boxerman (Hemisphere Games), 18.05.2017

Another actor is represented by **third party entities**. This actor encompasses, among others, funding institutions to which some of the interviewed designers apply for financial support, game jam organizers that suggest topics for games, as well as festivals and contests at which the designers submit their work. This actor is occasional, not always present in the design practice of some designers of indie games. The constraints third party entities impose vary from rigid to flexible based on the situation.

"yeah, Cat Licker, we want to make that again. That was a collaboration between my brother and I. That's a good example of the horror thing. That's a horror game that doesn't have darkness or death on it. It was a Ludum Dare[62] game, and I think the theme was, like, you are the villain, and we wanted to do something that was going to be different… we were, like, ok, how can we define villain, what's a bad guy thing to do that is not normally seen. And we saw, like, 'uh, licking other people's cats it's pretty weird'. Like, you consider that a bad person. So, we made a game about that. So, the mechanic is supposed, you know, to embody the licking, because you have to manually do it, and it doesn't really support the point-driven gameplay, but it definitely puts it in that kind of awkward, weird space we wanted the game to be. And that was kind of the game where we just went, there wasn't much thinking about it, like, we had the original idea, and we just went for it. 'Ok, so, it fits a little bit in terms of the subversion'; 'cos we wanted to make, like, sort of a horror game that wasn't, you know, like a typical horror" James Earl Cox III (Seemingly Pointless), 13.01.2017

Some of the interviewed designers, such as James Earl Cox III or Terry Cavanagh, among several others, mentioned participating in games jams, and therefore driving their design around flexible constraints. Other designers such as Tale of Tales and Broken Rul.es, mentioned having applied for funding, which implies they had to meet the requirements of some funding organizations or rigid constraints. A smaller number of designers also mentioned having complied to a given condition from a festival for the design of their games. These cases are, for instance, Douglas Wilson's

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[62] *Ludum Dare* is a weekend-Game Jam event that runs on a website every four months (Ludum Dare Community, 2018).

B.U.T.T.O.N. and Jim McGinley's (Big Pants) *The depths in which I sink*. The former originated from the requirement of creating a game that was played with a single button while the latter had as requirement creating a game that implemented the use of 3D movie glasses.

> *"I want to take these very condensed art experiences and I want to turn it into drinkable Tang. So, rather than it only being a game that, you know, game critics and other game developers and journalists can play, because they have the understood internal language, and they know how the medium works, I want to make it into something that is further reaching. So, they'll still have the critical components in the art scenes to them but the games would be longer and they would be more accessible"* – James Earl Cox (Seemingly Pointless), 13.01.2017

Another actor is the **client or publisher**. This actor occasionally exists among indie designers, since some of them do contract work or collaborate with companies that allow their games reach broader publics. Some of the interviewed designers such as Alina Constantin (Tiny Red Camel) and Danny Day, mentioned designing commissioned games. For these cases, these two designers pay careful attention to the client's needs and to characteristics of the target players. In addition, Broken Rul.es's Felix Bohtasch commented having had for *Old Man's Journey* a publisher who provided the single fixed constraint that the game had to be for mobile devices.

> *"In order to evaluate if that's fun I have to care what the player is doing with it. If I make a game that is only for me, that's fine, and I do that all the time. But I'm not necessarily gonna implement that, I'm not gonna try to make a living off of that. I have to find a way that something that is fun for me is also fun for other people. So, because I do client work they usually have specific goals, and it also tends to be either educational games or it tends to be serious games, or it tends to be games for specific purposes. I would usually always build a game for a specific person in mind"* – Danny Day (QFC), 16.03.2017

Illustration 6.3 presents a comparison of design actors in game design and among interviewed designers of indie games based on Bryan Lawson's model (2005). To the left, game design, with the designer, publisher and player as actors in a similar fashion as in Lawson's original model (2005). The publisher is closer to the designer because the publisher has strong meddling in the design undertaken by the designer, while the player is further away, which implies the designer has to reach out for the players from their own design context. In addition, since game design advocates for a player-focus kind of design (Fullerton, 2008), the player is portrayed with as the most important actor with darker color tiles.

To the right of the illustration, the actors identified among interviewed designers of indie games are depicted. The designer, as the most important actor, features dark-colored tiles. The co-designer is represented with dotted lines upon the designer, to indicate that this actor has equal meddling in the design of the games as the designers interviewed. Around the designer, the third party entities and the player are depicted, one on top and the other one underneath. Since these types of actors are the closest partially impacting the design of indie games, they are presented closest to the designer. Then, at the bottom of the structure, the client or publisher is depicted.

The actors for the design of indie games in illustration 6.3 display tiles with less color contrast in relation to the relevance and impact they have in the design undertaken by the indie designers. After the designer, the player is the actor with stronger presence, then the co-designer and right after third party entities and the client or publisher. However, these three types of actors are just occasional within the design of indie games. As well, righter-most tiles for flexible constraints are more visible than the left-most tiles for rigid constraints, because constraints conferred to the

designer by other actors tend to be flexible ones. Constraints mostly concentrate around the designer because of the personal nature of the games designed.

VISUALISATION OF DESIGN PROCESSES IN INDIE GAMES

Imagine again the car but now specifically its development pipeline. Imagine that the designers of the car conceptualize the car and then start building it, and while building the car they continue conceptualizing the car, wondering for instance, what would happen if the car was small but had two big wheels in the front and two small wheels in the back and rather look not like a car but like a carriage. So, instead of doing the conceptualization work in an office and on paper, the designers are at the assembly line putting car parts together and trying out different alternatives while still thinking about how to design the car.

Moreover, some designers of the car would have a specific objective on the car they want to design and would think "if the cars I like have aerodynamic coachwork, how do I make my tubular model also aerodynamic?" Other car designers would just put car parts together freely without a rigid goal and would think "ok, what if I have the engine at the bottom of the car, and passenger seats high above and over the trunk, and now let's try having converging seats so that passengers can be face-to-face instead of lateral to each other".

Eventually, after a series of design operators exploring possibilities, there comes the moment in which the car designers have before themselves what they can identify as their finished design and can just focus on producing the car, tuning it and polishing. However, the design is not over yet. While tuning the car, instead of just simply polishing details, the designers still decide to attach to one of the sides of the car an airplane wing. And while preparing the car to be out rolling on the streets, some designers add a new chassis and other designers already plan taking the car to the start point of the assembly line to start designing a new car. This hypothetical scenario encompasses some of the most relevant traits identified in the design processes of indie games among the interviewed designers.

UNDERSTANDING THE CODIFICATION OF THE DESIGN PROCESSES

> *"The game, it was organized around songs, 'cos that was the first most obvious way to organize it. We worked on this song, these interactions in the song, and then once when we started sort of putting songs together we started thinking about ordering those songs, and we´re still pretty much at prototype at this point, like, kind of rough. And then things crystalized in the overall structure how things should go. We had the idea of sort of having seasons"* - Brent Calhoun (Super Chop Games), 31.01.2017

> *"I start with the intention, and then I break down both sort of the engaging aspects of the subject, and then, I try to find mechanics that can reflect that"* - Alina Constantin (Tiny Red Camel), 20.04.2017

The following symbols depict the diverse elements of the design processes identified among the interviewed designers of indie games:

Design

Ⓒ Conceptualizing; it implies coming up with the ideas for games

Ⓡ Researching for the games while designing it

Ⓟ Prototyping of the game while designing it

Ⓑ Building of the game while designing it

Ⓣ Testing the game while designing

Ⓐ Balancing the game while still designing

Production

Ⓑ Building of the game while producing the game; no longer designing it

Ⓣ Testing while producing and no longer designing the game

Ⓐ Balancing the game while producing and no longer designing

Ⓢ Supervising other people's work while producing the game

Ⓓ Documenting the game as part of its production

Ⓜ Task management while producing the games

> Ⓡ << >> Ⓑ More than indicating that one action follows another, it represents that one action or activity opens the door to another one. For instance, Ⓡ << >> Ⓑ implies researching opens the door to building and that building bounces back to researching.

= Indicates that one action or activity implies or equals another one. For instance, Ⓒ = Ⓑ entails that conceptualizing and building imply the same; that the designer conceptualizes while building games.

↺ Indicates that the actions or activities within the brackets represent a creative loop including several design actions depicted between brackets. For instance, ↺[Ⓒ = Ⓑ] signifies that the actions of conceptualizing and building are undertaken as a constant loop by the designer.

Problem to solve or project without decisive constraints

₪ Moment at which the designer encounters or sets the initial context for the design, whether it is a problem to be solved for other people or a project without decisive constraints. It is when the designer knows the objective and goals for the design.

Approaches for design

−Ⓟ *Problem-solving* (Simon, et al., 1972) (Simon, 1996)

−Ⓕ *Framing* (Dorst, 2015)

C-K theory

-- ☼ Moment at which design is defined or becomes known for the designer from the perspective of C-K theory (Hatchuel, et al., 2003). It is here when the designer knows wholly what the game is about.

Table 6.4. Symbols for the visualization of the design process of indie games.

The following scheme shows an example of how to read the designers' design processes:

Designer Z conceptualizes and builds at the same time; both activities are synonymous for this designer. This designer conceptualizes and then implements the ideas and sometimes even conceptualizes by building the game. These generative actions are undertaken as a loop and are very characteristic of this designer (**bold letters**). After conceptualizing and building, testing and the balancing of the game take place. Designer Z designs games by implementing rules (1) and mechanics (2) while building.

For Designer Z, producing the game includes testing, balancing, supervising and task management. The green arrow pointing towards the design activities indicates design and production are not clearly separated. An absence of arrow would indicate a clearer separation.

This second section of the design process is an expansion of the original design; it indicates that once having a functional design unit, the core of the game, Designer Z embarks on creating levels or structuring a narrative.

	|←----------------------- DESIGN ---------------------→|	PRODUCTION	ELEMENTS TO DESIGN WITH
Designer Z	↻[$C_{1,2}$ = $B_{1,2}$] >T>A > Levels or scenes $C_{2,3,4}$>B>T $T$$A$$S$$M$ ----$₪$-------P --&--- F------- > --P--&--F----→ ------------------------→☼ -------------------→☼	PRODUCTION	1. Rules 2. Mechanics 3. Story 4. Level design

Designer Z sets up the design context, the problem to solve or the project without decisive constraints early in the process, while conceptualizing. If the ₪ symbol was missing, it would imply Designer Z does not set up an objective, and instead designs freely without a goal and without knowing where the design will lead to. If the symbol was blurry, it would mean the design context is not strongly defined.

Of the two approaches for design, Designer Z shows more predominance of framing over problem solving. And once the design Designer Z has been working on is defined or clear, both problem-solving and framing are undertaken with the same relevance.

After a series of design operators transforming concepts to knowledge and vice versa (Hatchuel, et al., 2003), the design is defined by the designer after the conceptualization, building, testing and balancing of the game. The designer knows what the game is about. If the red bulb was positioned earlier in the process, it would indicate the design is known or defined by the designer very early into the process.

While expanding a functional design unit representing already a game, Designer Z does not limit the design work just to creating levels for that design, instead, Designer Z adds new mechanics and a narrative that completely change the original design and shape it into a new version of the game but with some reminiscences of the original design. Due to this, there is a new moment at the end of this second design phase when the new design is known or defined by Designer Z. If the dotted line and the light bulb kept their original dark red color, it would mean the design expansion yields a totally different game; it would entail the game gets totally transformed.

Scheme 6.5. How to read the design processes by designers of indie games.

A CODIFIED VIEW OF GAME DESIGN

The following scheme is the representation of game design as presented in chapter 3:

	|←-------- DESIGN ------→|	PRODUCTION	ELEMENTS TO DESIGN WITH
GAME DESIGN	$C_{1,2}$>P>T>A D $₪$---P--&---F-----→ --------------------→☼	$B$$T$$A$$S$$D$$M$	1. Formal elements of games (Fullerton, 2008) 2. Dramatic elements of games (Fullerton, 2008)

Scheme 6.6. Representation of game design.

The design process for game design starts with conceptualization, then continues with prototyping, follows with playtesting and ends with balancing (©>Ⓟ>Ⓣ>Ⓐ). All these activities are clear-cut defined and identifiable. The process is prescribed as iterative. Documenting Ⓓ is also an important element of design according to the literature.

Based on the theoretical concepts presented in chapter 4 about design research, game design represents for the designer a problem to be solved. The design situation �🝈 that kicks off the design undertaken by the designer is configured by the publisher and the player. These actors have been already depicted and discussed in this chapter. With the design problem stated, the designer can then undertake the design, what would imply both problem-solving Ⓟ (Simon, et al., 1972) (Simon, 1996) and framing Ⓕ (Dorst, 2015).

Chapter 4 introduced C-K Theory (Hatchuel, et al., 2003). From this theoretical standpoint design is explained as the transformation of concepts into knowledge and of knowledge into concepts. After this series of continuous transformations undertaken through the design cycle (©>Ⓟ>Ⓣ> Ⓐ), there comes the point when it is clear for the designer what the outcome of the design process is about, when the design is known and identifiable (☼) in the form of a game. Once having the design of the game defined, the design is "locked" and the production of the game can start. This implies that, in terms of game design, **design and production of the game are two clearly separated processes within the development of a game**. The production of the game implies building the game, testing, balancing, supervising the production, managing tasks as well as documenting the whole development process (ⒷⓉⒶⓈⒹⓂ).

Among the views about the elements to work with for the design of games in game design, Tracy Fullerton's formal and dramatic elements of games is the most well-known (Fullerton, 2008). Game design prescribes the design of games by compositing different ingredients, such as rules, goals, procedures, choices, mechanics, dynamics, story, characters, enemies, etc. (Fullerton, 2008) (Brathwaite, et al., 2009) (Järvinen, 2008) (Oaxland, 2004). However, as it was also commented previously in this dissertation, a clear perspective on how to do such a compositing work has not been provided within game studies. Instead, designers have to rely on their intuition to design games (Järvinen, 2008). For this reason, it is only possible to infer that designers are supposed to turn to the formal and dramatic elements of games while conceptualizing © and then implement such ingredients as part of the prototyping Ⓟ.

DESIGN PROCESSES OF THE INDIE DESIGNERS: A CODIFIED OVERVIEW

Table 6.7 presents the design processes[63] identified among the indie designers interviewed for this research. The table presents the designers ordered based on structural similarities in the traits of their design processes. The most particular traits of each of the interviewees in the table are represented with bolded and bigger symbols:

Scheme 6.7 Representations of the design processes of the interviewed designers

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[63] These processes are iterative.

DESIGNER	DESIGN PROCESS		ELEMENTS USED TO DESIGN GAMES WITH
	|←------------------------ DESIGN ------------------------→|	PRODUCTION	
Daniel Benmergui	↺[©₁,₂,₃,₄ = ⒷB₁,₂,₃,₄>] >Ⓣ> Ⓐ ------------------- Ⓕ------------- > --Ⓟ-&--Ⓕ-----> --> ☼	ⓉⒶⓈⓂ	1. Assembling images, events and interactions. 2. Adding features and mechanics 3. Adding player actions 4. Grouping feature-based fragments until having numerous levels.
Ditto	↺[© = Ⓑ₁,₂,₃,₄>Ⓣ] < >Ⓡ>Ⓣ>Ⓐ ------ ₪----- Ⓕ------- --Ⓟ-&-Ⓕ→ -----------------------→ ☼	ⓉⒶⓈⒹⓂ	1. Working with and meshing up mechanics 2. Working with and meshing up features from different games 3. Coming up and working with interactions 4. Working with and adjusting difficulty
David Kanaga	↺[©₁,₂,₃,₄ << >>Ⓑ₁,₂,₃,₄] < >Ⓡ>Ⓣ ----------------Ⓕ--&-Ⓟ---→ -----------------------→ ☼	Ⓓ₄	1. Compositing elements within the game as if they were music elements or voices in a music sheet 2. Working with game engine assets and compositing them 3. Assembling a narrative 4. Creating a context and philosophy into which embed the game (libretto).
Alistair Aitchenson	↺[©₁,₂,₃,₄,₅,₆ << >>Ⓑ₁,₂,₃,₄,₅,₆>Ⓣ] ----Ⓕ------- ₪----------Ⓕ--&-Ⓟ---→ -----------------------→ ☼		1. Working with interactions 2. Working with constraints and affordances of real life objects 3. Working with interfaces 4. Working with elements from other games 5. Working with puzzles 6. Propitiating play outside of the game
Douglas Wilson (Die Gute Fabrik)	↺[©₁,₂,₃,₄,₅ << >>Ⓟ>Ⓑ>Ⓣ] ----Ⓕ------ ₪----Ⓕ--&-Ⓟ---→ -----------------------→ ☼		1. Working with constraints 2. Working with motion control 3. Working with interactions 4. Affording physical play 5. Working with audio

XRA (Ezra White Hanson)	↺[C₁,₂,₃,₄,₅,₆ << >>R>P₅,₆,₇>B₅,₆,₇>T] ----F------- ₪-----P--&--F--------------→ -----------------------→ ☼ -→ ☼ -→ ☼ D	1. Working with visuals and sound 2. Working with mechanics, 3. Creating puzzles 4. Working with interactions 5. Creating environments 6. Affording and inducing exploration 7. Designing levels
Ed Key (Twisted Tree Games)	↺[C₁,₂,₃,₄ << >>B₁,₂,₃,₄,₅]>R>B₆,₇,₈>T --------------₪------------F-------------------- -P-&-F-> ------------------------------------→ ☼ BTASD M	1. Working with Interactions 2. Working with mechanics 3. Working with rules 4. Working with sounds 5. Creating environments 6. Adding features 7. Working with characters 8. Creating a plot
Brendon Chung (Blendo Games)	↺[CR<>>>>B]>T -----F→₪ ------------F-&--P-→ -------------------------→ ☼ TM	---- ----
Justin Ma (Subset Games)	↺[C₁,₂,₃]<< >>B>T -----F-------₪----F--&-P----→ ----------------------------→ ☼ BTAM	1. Working with mechanics 2. Affording a feel 3. Transferring a type of control from other games to the game designed
Patrick Smith (Vectorpark)	↺[C₁<< >> B₁,₂>Drawing >T]> --------- F-------------------- > ₪ -F-P> ---------------------------------→ ☼	1. Working with interactions (not necessarily as rules, but more toy-alike) 2. Finding a rhythm for the elements created
Terry Cavanagh	↺[C₁,₂,₃< > B₁,₂,₃>T] > Levels or scenes C>B₃,₄,₅,₆>T>A ----F→₪ --F-- or --P-> ---------P--&--F-------→ TADM ------------→ ☼ or --→ ☼ or ------------------→ ☼	1. Working with mechanics 2. Working with elements within the game world 3. Working with events to happen in the game 4. Working with actions characters do 5. Working with levels and a plot 6. Working with difficulty

Designer	Process Diagram	Notes
AP Thomson (Hexecutable)	©1,2>®>®>®>Ⓐ > ↻[Levels or scenes ©3,4,5< >Ⓑ3,4,5]>Ⓣ>Ⓐ Ⓣ Ⓐ Ⓢ Ⓓ Ⓜ ₪ ----Ⓟ-- &--Ⓕ--→ --------------Ⓟ-- &--Ⓕ--------------→ --------------------→ ☼ ------------------------→ ☼ ↻[Ⓑ>Expanding through levels]3,4,5>Ⓣ>	1. Creating contexts with lose or win conditions (rules) 2. Working with mechanics 3. Working with gimmicks 4. New mechanics and extra features 5. Exploring thematic, characters and motivations
Jim McGinley (Big Pants)	©1,2>Ⓑ>Ⓣ>Ⓐ > ↻[Levels or scenes ©2,3< >Ⓑ>2,3]>Ⓣ> Ⓐ Ⓣ Ⓐ -Ⓕ->₪ -Ⓟ-&-Ⓕ→ --------------Ⓟ-- &--Ⓕ--------------→ --------------------→ ☼ --------------------→ ☼	1. Working with interactions 2. Working with mechanics 3. Making level variations that expand the main gameplay
Jason Roberts	©1>Ⓟ>Ⓑ>Ⓣ>Ⓐ > **Levels or scenes** ©2,3,4>Ⓟ>Ⓑ>Ⓣ Ⓣ Ⓐ -Ⓕ->₪ -Ⓟ-&-Ⓕ→ --------------Ⓟ-- &--Ⓕ--------------→ --------------------→ ☼ --------------------→ ☼	1. Working with Interactions 2. Creating puzzles 3. Working with a story / narrative / scenes 4. Working with visual compositions
Richard Boeser (Sparpweed)	©1,2>®>Ⓟ>Ⓑ>Ⓣ>Ⓐ Levels or scenes Ⓑ2,3,4,5,6>Ⓣ>Ⓐ Ⓣ Ⓐ Ⓓ Ⓜ ----Ⓕ→₪----Ⓟ--&-Ⓕ-→ --------Ⓟ--&--Ⓕ------→ --------------------→ ☼ -----------------→ ☼	1. Working with mechanics 2. Working with features 3. Affording challenge 4. Affording progressing 5. Inducing the feel of achievement
Anders Gustafsson (Cockroach Inc.)	©1,2,3,4>Ⓑ>Ⓣ **Levels or scenes** Ⓑ2,3,4,5>Ⓣ] >Ⓐ Ⓑ Ⓣ Ⓓ Ⓜ ----Ⓕ----₪-----Ⓕ---&--Ⓟ-→ --------Ⓟ--&--Ⓕ------→ --------------------→ ☼ -----------------→ ☼	1. Working with mechanic 2. Working with dialogs and a story 3. Creating puzzles 4. Explore the potential of a narrative 5. Structuring based on a *Zelda* game-alike unlocking-structure
Tom Sennett	©1,2,3,4,5>Ⓟ>Ⓑ>Ⓣ> Levels or scenes ©1,2,3,4,5> Ⓑ1,2,3,4,5>Ⓣ>Ⓐ Ⓣ Ⓐ Ⓜ ---Ⓕ->₪----Ⓟ-&-Ⓕ→ --------Ⓕ----&-----Ⓟ-------→ --------------------→ ☼ -----------------→ ☼	1. Mechanics 2. Analyzing other games and trying to integrate features 3. Affording challenge 4. Working with power-ups
James Earl Cox III (Seemingly Pointless)	©1,2,3,4,5>Ⓟ>Ⓣ Ⓣ Ⓓ ---Ⓕ→₪ -------Ⓟ---&--Ⓕ-→ --------------------→ ☼	1. Mechanics, 2. Working with emotion, 3. Creating an atmosphere, 4. Working with interactions 5. Creating an experience

Auriea (Tales of Tales)	C_1>Ⓡ<>Ⓑ>Ⓣ>Ⓐ> ----Ⓕ->₪ --Ⓟ-&-Ⓕ→ ----→ ☀ --------------→☀	←——————→ ⓉⒶⓈⓜ Ⓓ$_2$	1. Working with characters, environments, contexts, narratives, and relationships among elements 2. Creating the context where the game exits
Lucas Pope	$C_{1,2}$ >Ⓑ$_{2,3,4}$>Ⓣ ----Ⓕ→₪ ---Ⓟ--&-----Ⓕ-→ ------→ ☀-----------☀	ⒷⒶⓉⒹ	1.Working with mechanics 2.Working with a narrative 3. Plot 4. Adding elements for subversion
Nathalie Lawhead (Alienmelon)	Ⓒ$_{1,2,3,4}$>Ⓑ>$_{3,4}$>Ⓣ --Ⓕ→₪ ------Ⓟ---&--Ⓕ-→ ------→ ☀ --------------------☀	Ⓣ	1.Working with interactions 2. Working and adding funny things 3. Working with glitches 4. Adding Easter eggs
Nina Freeman	Ⓒ$_{1,2,3}$Ⓡ$_{1,2,3}$>Ⓟ$_{1,2,3}$ ----Ⓕ→₪ -Ⓟ-&-Ⓕ-> --------------------→ ☀	ⒷⓉⓈⒹⓜ	1. Working with stories, narratives, and characters 2. Creating experiences 3. Working with mechanics
Alina Constantin (Tiny Red Camel)	Ⓒ$_{1,2,3,4}$>Ⓡ>Ⓟ>Ⓣ>Ⓐ -Ⓕ->₪ -------Ⓟ----&--Ⓕ---------→ --------------------------→ ☀	ⒶⓈⒹⓜ	1. Working with intentions and experience to provide 2. Working with player actions 3. Structuring rules 4. Using narrative to take players through
Danny Day (QCF)	Ⓒ$_{1,2,3,4}$>Ⓡ>Ⓟ>Ⓣ ----Ⓕ→₪ ---Ⓟ-&-Ⓕ-> ------------------→ ☀	ⒷⓉⓈⒹⓜ	1. Working with mechanics 2. Working with rules 3. Creating problems to solve for the player 4. Creating an experience
Felix Bohtasch (Broken Rules)	Ⓒ$_{1,2,3}$>Ⓡ>Ⓟ>Ⓣ ----Ⓕ→₪ ---Ⓟ-&-Ⓕ-> ------------------→ ☀	Ⓑ$_{4,5,6}$ⓉⓈ Ⓓⓜ	1. Working with constraints 2. Working with mechanics 3. Working with emotions 4. Working with a narrative 5. Creating with puzzles 6. Creating levels

Matt Meyer and Brent Calhoun (Super Chop Games)	C[1,2,3,4,5] > R > P > B > T ----F----₪----F----&---P--------→ ---------------------→ ☼ -→ ☼ -→ ☼	B T D M	1. Working with sound and music 2. Affording control interactions 3. Matching interactions and visuals with sound and music and vice versa 4. Affording a feel 5. Creating an experience
Erik Svedang	C[1,2,3] > R > P > B[4] > T > A ----F→₪----P--&--F-→ ----------------→ ☼	T A S D M	1. Creating experiences 2. Working mechanics 3. Working with interactions 4. Doing Level design
Eddy Boxerman (Hemisphere Games)	C[1,2] > R > P[1,2] > T > B[3] > T > A ----F→₪----P--&--F-→ ----------------→ ☼	T A D M	1.Rules 2. Mechanics 3. Challenge / difficulty
Andy Schatz (Pocketwatch Games)	C[1, 2] > R > P[2,3] > B[2,3] > T > A ----F→₪ ---P--&--F-→ ------→ ☼---------- ☼	B[4] A S D M	1. Mapping real ecosystems and transforming them into digital systems 2. Working with mechanics 3. Working with characters and players roles with different nuances and asymmetries
Logan Olson (Hard Light Labs)	C[1,2,3,4] > R > P > B > T > ----F→₪ ---P-&-F-> --------------------------→ ☼	B[4] T A M	1. Working with interactions 2. Mapping how things as instruments work 3. Creating a virtual reality experience 4. Analyzing virtual reality applications' interfaces and implementing such elements

The design processes portrayed in table 6.7 feature variations in their structures (ⓒⓇⓅⒷⓉⒷ ⓉⒶⓈⒹⓂ). Some of the processes feature more activities than others; some of them lack of researching, some of prototyping, some of documenting and some of the whole production phase. This should not be seen as a lack of quality in the undertaking of the design or in the games resulting of such activity. As Bryan Lawson (2005) argues, there is no right way to design.

The differences in processes are due to numerous factors, such as the kind of games designed, the context for the design, the resources of the designer, the size of the design teams, the participating of co-designers, as well as where the games will be played and their reason for existing. All these circumstances shape how designers undertake design[64]. The personal characteristics of the design of each of the interviewed designers are summarized in Appendix A.

Yet, despite of the differences in design processes due to particular circumstances and style of each of the interviewed designers, the results allow reaching an understanding about the characteristics of the design of indie games. The research found that among indie designers each of the different design activities for the development of the game have multiple connotations, such as follows:

> - Conceptualizing ⓒ implies coming up with ideas for games, structuring such ideas and finding out how to articulate the game. For most of the interviewees, it also entails already working with the prototype, exploring ideas through prototyping. As well, it encompasses to lesser degree doing research on the topic of the design or on technical issues and analyzing or being critical about the design. Conceptualizing also implies working on paper, writing design notes or taking the design thoughts out of the head into writing. Just in very exceptional cases implying the applying to funding or sharing information with externals, more structured documentation is developed. Conceptualizing is then as follows: ⓒ= ⓒ,Ⓟ,Ⓡ,ⒹÃ.
>
> *"What I try to do is to get input from many different things, like, I try to listen to music and watch movies and experience things that are interesting. That could give me ideas. But it's very unclear that works like it. It's more like an unconscious thing. But I think it's very important to get the correct input as a creator or artist. In a way, it's what you experience what allows you to create new things, like, you need to experience things to get ideas, so, I am conscious on that, but I don't want to think too much on how that actually happens because I'm scared I gonna block myself"* – Erik Svedang, 3.05.2017
>
> *"My design is very much like that; I steal as many ideas as I can from as many games as I can. If you just do that a lot at some point you're gonna end up with something that looks original; in the end is just like a big boiling pit of, like, stolen ideas. Yeah. I'm very motivation driven, so, I often try to challenge myself to recreate or reenact something that I like in another video game. In the prototype I'm working on right now you have a bunch of jumping, and then I played a bit of Zelda and the day after I implemented doing the summer sword thing that you do in Zelda when you flip all the time. So, I had to implement that, just to, like, steal that idea.*

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[64] The reader of this text should take into account who the interviewed designers are and what are the kinds of games they design. The first table of this chapter helps as reference (6.1). In addition, it should be considered it is not the same to design a game that consists of a single mechanic than a game that implies many actions to be undertaken by the player, or to make a 2D game than a 3D game or to work as a team or as a single individual. It should also be minded that some of the games are intended to be published and be sold on an online store, while some of the games are for venues, and some of them are designed without mattering if someone will ever play them and just because the designers are passionate about games and through making games they feel realized.

It's something that I like in another videogames, by taking and putting it in my own game; it's often just a challenge". Ditto, 16.03.2017

- Researching Ⓡ entails digging intentionally into bibliographic and ludographic resources to get information contributing to the designing of the game. This activity impacts the conceptualizing Ⓒ, prototyping Ⓟ and understanding of the design of the game.

"I also do research into how other videogames approach doing this thing that I am doing. You kind of look at it as those other games that have done a lot of the prototype work for you. So, you can kind of play them and kind of treat them like a prototype and kind of take the things that work well and kind of think about how can I improve this that they have made" – Brendon Chong (Blendo Games), 21.03.2017

- Prototyping Ⓟ not only involves working on a prototype, as part of the design undertaken by the interviewed designers, it is in great extent conceptualizing the game and structuring it, finding out how it has to be articulated. In addition, for some of the designers it also covers working with the information gathered about the game or even building the game. Prototyping is: Ⓟ=Ⓟ,Ⓒ,Ⓡ,Ⓑ

"I usually start with prototypes, because my ideas are usually focused. There's usually one core element that, if I can get a playable something, a playable prototype of it; or get some visual representation of it quickly to sort of, the understanding if it's gonna work or not; or what will it take to make it work, or if my preconceived notions were totally wrong or totally right. So, because of the ideas I come up with, usually it is pretty quick to go to the prototype or the experimental stage, throwing something upon the screen" - Lucas Pope, 3.04.2017

- Building Ⓑ is already the formal making of the game while designing it, and several of the interviewed designers opt for this possibility than a provisional prototype. While building, designers still conceptualize the game, find out how to articulate it and try out possibilities for the different elements they design their games with. Building can be seen as Ⓑ=Ⓑ,Ⓒ

"With computer games, usually if there's like a story-based game, I have something in mind. Then, a prototype isn't really the right thing; it's more like an exploration towards the final game. I just work towards getting the whole thing so you kind of...I would not call it prototyping, is more actually working on the actual game and feeling your way forward" – Erik Svedang, 3.05.2017

- Playtesting Ⓣ among the interviewed designers involves testing their designs themselves, testing the game with peers, testing with friends, testing at festivals, sending betas to friends and receiving feedback from people who try out an open build of their designs. The information gathered through testing contributes to the balancing of the games. Testing is for the interviewees the most important activity for the analysis and criticality upon their designs.

"That's the first testing I do, and that is internal. So that's the testing with the other members of the team. 'I have this idea; I think would be really great, if this character would do this'. And then the player would have to do that and that involves, as I said, scribbles, thumbnails, and talking, a lot of talking. So, people who work with me, have, I've sort of managed this to work with people who like to listen; because I talk a lot. I sort of process the idea, if I can express the idea to you, then I would try to express it to my programmer, and I would try to express it so, to our regular team. But in the other game that I'm working on, I'm working with people who don't work with games at all, who are activists, and teachers, and stuff like that. So, that's the harder ones to test, but I still test the idea. I'd say 'ok, I think the player should get these rules, and then they should do this'. So, I'd go with conversational kind of explaining the idea, and asking them if they have understood the

basics, like, sort of, kind of again, like a lot close to theater impro: 'ok, if you would be this character, now this is how you function, what would you do in this situation?'" – Alina Constantin (Tiny Red Camel), 20.04.2017

- Balancing Ⓐ among the interviewed designers refers to verifying and perfecting the design of the games to secure they are functional, as well as later on tweaking values to afford progression, afford challenge or to increase difficulty.

"The way that it kind of comes together at the end is kind of a mixture of just a lot of iteration and just kind of slowly tweaking it over and over again, and a lot of luck, just, like; the pieces just happen to fall into place. I kind of like to think of it as, like, a game is like a giant piece of clay and you just have to shape it over and over again until eventually it slowly slowly starts to gain shape; it kind of starts to solidify; so, that is kind of how the way the game just comes together; just the pieces very slowly come together" - Brendon Chon (Blendo Games), 21.03.2017

These multiple connotations of the design activities were identified in most of the interviewed designers. However, this phenomenon is more present or more relevant especially by some of the interviews and at specific parts of the development of the games. For this reason, the visualizations of the design processes for these designers (table 6.7) feature blocks of creative loops where the design practices focalize (↺[Ⓒ = Ⓑ]) or the design activities bounce back to each other instead of immediately leading from left to right (ⒸⓇ<<< >>>Ⓑ) .

"There's usually a drawing at some point and sometimes the idea comes from the drawing; so, I just draw things without even trying to think of ideas just in my spare time, and something in there would seem interesting. Sometimes I have an idea and I'd draw it out and kind of work through some things on paper and once I see something definitive, then I sit on, and try to write some code to make it work. And, usually, there's always a cycle that at sometimes it's never what you think it's gonna be exactly. So, I might go back and do some more drawing, or put it aside and think about some more, and I go back to it, and change it, or redo it. Eventually a project kind of finds its form and it becomes more like it's completing itself. But especially in the early stages there's a lot of trying things, seeing what works, seeing how it feels, and then trying again" – Patrick Smith (Vectorpark), 3.02.2017

In addition, the separation between the design of the game and its production is not clear-cut among interviewed indie designers. This is due partly to the peculiarities in design style regarding framing Ⓕ and the "locking" of the game idea that will be explained in next sections. Another reason is that there is not always the need for a production phase as it is understood within game design, especially when indie designers do not work with or supervise other people, or when the game is intended to exists just as it is right after finishing its design. In fact, just for few designers it is possible to identify crisply a design phase and a production phase (Ⓒ>Ⓡ>Ⓟ>Ⓑ>Ⓣ ⒷⓉⒶ ⓈⒹⓂ). For most of the interviewees, the design extends into the making, polishing, tuning and managing of the game, its production (Ⓒ>Ⓡ>Ⓟ>Ⓑ>Ⓣ ⟵ ⒷⓉⒶⓈⒹⓂ). However, for a handful of designers a production phase does not apply.

"The project kind of just started accidentally, ´cos I was just working on Panoramical and then, I, first, I was just playing the game a long time, and then thought: 'oh, let me just sort of screw around with the visual components, just as if they were the audio. Oh! this is kind of fun. I can do really dramatic things very quickly'. And then, 'oh, well, let me try placing things in the environment'. And Fernando[65] showed me how to do the landscape tool and I was like 'oh, my god'. And then, I went crazy, just like building, you know, a pretty dumb landscape or whatever, and peppering it with little free objects that I found online. But then I felt like, 'wow! I could be really serious about it! I could make a whole, I'd like to make a whole game in this way'. And so, I

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[65] Fernando Ramallo is co-designer of one of the games of David Kanaga: *Panoramical* (2015).

commissioned Fernando to write these tools so that I could trigger things and so that I could change the camera between first person, third person and fixed camera. And, yeah, so that happened. And then, there was a few stages of iteration on the tools where I would work with them for a while and then we would go back and make some changes. And one of the changes was make the camera changing the values of the third person camera, and that was like an incredible revelation ´cos now I could move the camera further back away from the character. I can move it up and down, and I could change the angle of it. And so suddenly I felt I was given these sort of means of doing it, like game cinematography in a really expressive way." – David Kanaga, 30.06.2017

Documentation Ⓓ has a special role among indie designers and it varies and depends on who they collaborate with, what kind of games they design and whether someone external from the design should also read such documents. Documentation consists primarily of personal design notes and writings such as post-its and notebooks, and extends to emails, shared online documents, lists, blog posts and in a few cases formally structured design and production documents and even postmortems. Special cases are the texts created as part of the design of the game, such as manifestos, librettos, manuscripts, etc.; documents that create the context for the games to exist and without such the design would not be complete.

> *"it's more the writing down of the manifesto or the article or whatever about how we work or what we think about game; it's an outcome of what we make. We describe why we made it that way, in a way, or what we hope other people will follow in whatever design we've made or get out of it like from other designers. You know, if you're looking at this and you're a game designer we hope you get this out of it. That's the only reason why Michael's written postmortems or anything like that, is to try to communicate what we're trying to do.… it's important to do it at certain point because people were looking at us like, 'what are you doing?' And so, we were, like, well, got tired, and the reason why we felt like that important what we're trying to make a space for where our work could exist, and could be sold, or it could be experienced in a way that people could understand. And if people weren't understanding we had to explain it, so, that's what we did. You know, otherwise people were just like, 'get out of here', you know. But since we took the time to, you know, go through it, and like, feel like, no no no, here's the things that we think about, then people were sort of, like, part of that dialog, and it made space for us, and it made space for other people who wanted to create weird games"* – Auriea (Tales of Tales)

A series of elements have been identified as the ingredients the interviewed designers use for the design of their games. These elements not only come into play while conceptualizing but also while prototyping and building the game (Ⓒ,Ⓟ,Ⓑ). They are used both while designing the core concept of the game as well as while working on levels, scenes or puzzles, when expanding the game. These elements include for instance, working with interactions, trying to embed a feel, working with music, working with emotions, with music or creating puzzles, among others. The elements are various and show that designers can make games and playful things out of many different things.

> *"My process has been doing the audiovisual stuff first; it is how I want something to appear or sound to the player and that kind of drives the overall tone and then I try to get mechanics that would work with it to support the visuals and audio".*[66] – XRA (Ezra White Hanson), 29.07.2017

Chapter 4 introduced *C-K theory* (Hatchuel, et al., 2003). From this theoretical standpoint, the elements the designers work with as well as constraints provide information that expands the knowledge of the designer and lead to the generation of new concepts. Notions such as what is a game about, what kind of feelings a song conveys, the personal interpretation of an emotion, what

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[66] This is one of the several examples in which designers first start working on the aesthetic experience to be provided and then on a game mechanic. This approach is an opposite to the *MDA framework* (Hunicke, et al., 2004).

is possible to do or not with controllers or how big is the space where the game will be played, become part of the propositions with logical status for the designers. These propositions allow the designer obtaining new knowledge as well as coming up with new concepts, which in terms of *C-K theory* are propositions without logical status (Hatchuel, et al., 2003). An exemplification of these events is depicted in chapter 4. An upcoming section of this chapter will also explain the series of transformations from concepts to knowledge and from knowledge to concepts that undertaking design implies based on the accounts of one of the designers participating in the research.

> [About getting inspiration from everyday life routines] *"….sort of, it's like quite that narrow, when you find a routine somebody does, but it's kind of that idea, where you find just some small thing that you think can turn into something mechanic-wise, or story-wise, or something. If you think this small thing could represent a bigger thing and the idea is sort of, the focus is very very narrow. So I'm not trying to make an RPG[67] where there are side quests. I am trying to do one very specific thing, and I'm not even doing it well. I mean, just one thing because, for me it helps me to have that kind of focus. Production-wise it's incredibly useful to have that sort of focus, like, 'ok, the game is about this one thing'. But also from marketing and human interest perspective, I think it's a lot more powerful. I love AAA[68] games; I love big games, but I think it's really a lot more powerful when you can have something like that where it's easy to describe the game, when you see the game and understand what it is and there's no other questions about how broad something is. For me the focus, a narrow focus is very important. So, ideas that sort of encapsulate that better or represent that well are the ones that I like more. And that comes up a lot on things people do, on routines, actions, things like that. But you know, there's other ways where it sort of comes up. So, it's not necessarily just the actions of people, but it's sort of everyday things you might notice and think 'well, that particular thing has a very strong unique individual representation, and it could make a game'. You could make a game out of that"* – Lucas Pope, 3.04.2017*

THE DESIGN SITUATION

One of the first sections of this chapter portrayed the situations 🔲 designers encounter and that kick off their design activity. Motivation-wise, these situations were classified as either extrinsic, problems to solve for externals, or intrinsic, self-structured or collaboratively structured projects or projects with voluntarily-accepted but flexible constraints. As either the designers were called in to design a car by request from a manufacturer or if they just were just showing up in car assembly line and by own initiative started working on the car they want to create.

The research showed that in all these design situations 🔲 but especially for those that come from the designers themselves, the interviewed designers formulate or frame Ⓕ the contexts around which their design practice revolves. Those designers that do contract work or are commissioned take their time to understand the needs to meet and then envision and propose the kind of game they have to design to meet specifications. And as for those designers who work on the projects they want, these designers formulate what is that they want to achieve, what kind of games they want to design; if it is either a game inspired in the games they like, or a game based on a specific topic, or simply an interesting idea to pursue.

However, the formulation of the design context 🔲 among the interviewed designers cannot be reduced to an event that triggers a staged and sequential development process. First, as already

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[67] Role playing games.
[68] Mainstream games

mentioned, the design processes of the designers previously depicted are not sequential or lineal phenomena (Ⓒ→Ⓡ→Ⓟ→Ⓣ); they rather consist of activities leading to others, bouncing to each other or even encompassing each other (Ⓒ>Ⓡ>Ⓟ>Ⓑ>Ⓣ, ↺[Ⓒ = Ⓑ] or even ⒸⓇ<<< >>> Ⓑ). And second, especially when working on projects without decisive constraints, the interviewed designers develop their games through different temporalities. Designs span through different times where many ideas that come and go, transform, mature, get discarded and mutate. Through the undertaking of other works, prototypes, conversations and obtained learning, ideas nourish and eventually just a few of these designs reach a public as a game. Thus, conceptualizing Ⓒ, prototyping Ⓟ and building Ⓑ can take place in multiple scenarios and times and even revolve around different matters and still be part of the design of the same single game.

> *"Especially with Blueberry Garden I did a lot of sketches and drawings, I was kind of dreaming about making the game for a year or two years before... I had a lot of time where I can just sit and draw things I wanted to be in the game. Then in the end a lot of those things developed... there was definitely a lot of it planned out beforehand"* – Erik Svedang, 3.05.2017

> *"Joust, I did that in a weekend, but that, the questions I had going into the Game Jam and the technology I used and all the lessons I learned from motion control came from lots of failed and successful motion control games in the years prior. So, you know, even if someone says, 'I did this in a weekend', that can be misleading, like, it was, very much tight to those technical design social lessons that I had learned. So, it's maybe a little misleading to say that it was only done in a weekend"* – Douglas Wilson (Die gute Fabrik, Copengahen Game Collective), 19.08.2017

In addition, the situations 🔲 around which indie designers undertake their design activities are influenced by spontaneity. Conversely to game design where a market need triggers the design process, indie designers do not have to start their design with a need nor with the pressure of producing something. Ideas come to the designer spur of the moment while doing other activities and it is up to the designers to decide the fate of such ideas.

> *"It means that now and then new ideas pop up, saying it, like, it mostly happens when I go somewhere and I have some time for myself and I don't have to think in all the other stuff that I need to do without conscious trying to think in new ideas. That's when there is enough space in my head to come up with something new. But also, just like showers in general, and that kind of off time. I really feel that this initial tiny spark is created, and is also the part I have least control. I have the feeling that everything after that, I quite know what I'm doing. But the first initial thing is, like, it´s something someone says or maybe something you see in a game and then realize 'oh, this would be totally different, that would be an interesting thing'. I can't pin point at that or no more than that"* – Ricard Boeser (Sparpweed), 21.06.2017

> *"It just comes to us. It just pops in there. Or we're talking, or we're on the train and we're looking at the forest and we're like 'oh, let's make, we should make a multiplayer game that takes place in the forest. Everybody would be here, yeah'. You know, and then we think we're joking, and then we write it down and two years later we're like 'hey, that was a good idea'. You know, whatever. It's like, it just comes, we don't know where it comes from"* - Auriea (Tale of Tales), 7.06.2017

Moreover, a few of the interviewed designers undertake their designing activities knowing very vaguely what they are working on or not even knowing such a thing; they design without specifying what is the final kind of game they want to create (🔲 or the absence of 🔲, respectively). These designers claim to let the design of their game go its own way; they design relatively goal-free putting elements together, seeing the result, then trying out other

configurations and so on until eventually opting for a solution they had not considered or aimed at before.

Although this goal-free designing is something very specific of some of the interviewed designers (absence of 🔃), a considerable degree of openness of the design or the lack of rigidity is a phenomenon that is common among most of the interviewees. For instance, while working on levels or scenes, the designers do not only extend and tune the game with new scenarios or worlds, they expand the design by adding new mechanics, features, gimmicks and other elements that completely change the sense of what they are designing. As well, the designers also design around unexpected things that happen during the design, such as glitches or bugs. More than implementations of their design ideas, prototypes and especially builds constitute to different extent among indie designers the canvas upon which design is undertaken.

> *"I was coding and then we were trying the accelerometer values. Originally, that game was supposed to be a race, and while we were testing not the gameplay but kind of the game file, like, the accelerometer stuff, we would end up just kind of pushing each other to get each other out, and then so, kind of organically, it was, like, 'oh, ok, this is more kind of a combat game that it is a racing game'. Because that was what we were instantly doing."* – Douglas Wilson (Die gute Fabrik, Copengahen Game Collective), 19.08.2017

> *"Often, when there's a bug, I actually decide to go with it and build something around that bug because it's funny or interesting or different. It's kind of rolling with whatever happens. It makes it interesting. You can sit down and say, it's structured and organized, but I feel, like, really interesting ideas and experiences come out of, when you just don't plan, and you just kind of go with whatever problems or issues arise. It's almost like the computer is making it with you at that point. It's kind of romanticizing bugs, which are totally not cool to have, but it can be interesting"* – Nathalie Lawhead (Alien Mellon), 31.01.2017

APPROCHES FOR DESIGN

Back to the imaginary scenario of the design of the car from an indie games perspective, while designing, the car designer could encounter situations that would induce several reflective thoughts. For instance, the car designer could think: "ok, now the engine is at the rear of the car, how could I connect it with the steering wheel in the front? Could I take some pipes through the base of the car? Or should I do the connection from above the car or from the side? Which way would be better?".

As well, the car designer could have this other kind of thoughts: "now, I have several car parts in front of me, they seem to connect to each other, but I want to re-work their interface to avoid connecting them as usual and try to come up with a new composition. I will also try to replace all plastic surfaces and use wood and wool instead, to show my peculiar style as designer".

The two previous examples of reflective thoughts of the car designer represent the two approaches for design broadly discussed in chapter 4, problem-solving ⓟ (Simon, et al., 1972) (Simon, 1996) and framing Ⓕ (Dorst, 2015). According to Kees Dorst (2015) both approaches pertain to designing. Results show that these two approaches (ⓟand Ⓕ) are identifiable in the practice of the interviewed designers, sometimes even mixed or combined.

> *"You propose mechanics and thereafter explore what interesting ideas that mechanic affords. And then you go profiling, 'ok, it yielded this interesting ideas, I will keep this one'. And now I will start exploring from thereon. That is the forward-focused design, why is it forward-focused? Because there is no final objective, I am not saying this is what I want to make, but that you are exploring all the possibilities in a preselected space.*

Backward-focused design, on the other hand, would be, for instance, an adventure game. It is the entire contrary. In general, it is stating that the adventure game aims at reaching this specific point. To get to that point, you have to go through the bridge, then I break the bridge, then you have to search for a way to cross the bridge. Then, I say, 'ok, I am gonna have wood tiles and nails somewhere but I will have them separate'. This way of designing is already backward-focused. You already have decided where you want to go and you are trying to trace out a way to reach that point. That would be the difference between the forward-focused design and the backward-focused design. Anyhow, you can never purely do forward-focused design. There is a bit of forward-focused and backward-focused design. But overall, I do more forward-focused design, more about experimenting, to see what in the universe of things the game itself proposes"- Daniel Benmergui, 31.01.2017

"when the whole thing sort of unrolls in front of me, I can see the whole game; like the initial idea, and so I start working on it, prototyping it, changing things, finishing parts that didn't work, basically just running into problems, considering the problems that need small solutions. Sometimes big problems need big solutions, but normally just sort of solving things here and there as I go; prototyping it, testing it, finding things that work or don't work. And then hopefully, it sort kind of comes together into something where is not always the same as my initial vision, which I could see in front of me, but I feel like it's unique and interesting to me personally, and I think people may be interested as well. And at that point I just kind of lock in and then I can just sort of finish the game. I can do little things I think it needs. I can fix things here and there. I can give it a little bit at some places, and then finish the game, and then, usually when I'm developing a game, I try to tell people as I'm developing to give feedback and sort of that kind of leads me to the end where I just release the game and then try to forget about it completely." – Lucas Pope, 3.04.2107

"I kind of focus on one part of whatever the problem is I'm trying to solve, or the specific thing I wanna do; and I kind of make a thing; and just different things. I look at reference images. I try, like, to find relations to real world examples; then I also sometimes look at games to see, not so much like, how I should do it, but I look at games to see, like, well, what's the gameplay implications of this idea, are there any other games that have similar, like, implications with their design, and what do they do to, like, balance any stuff like that, something that helps" – XRA (Ezra White Hanson), 29.06.2017

"I wonder if I'm able to do this just in the way that they did it in this game and then I try to challenge myself like that. So, GoNNER actually started, you know, Super Meat Boy; I was thinking to myself 'I wonder if it's possible to have guns in Super Meat Boy', because the platforming is so precise and there's so many, I mean, the platforming itself takes so much energy in the player that putting weapons in there would probably make it difficult to play the platforming part. So, it was a challenge to see what kind of thing you do with that, if you had a platformer as precise as Super Meat Ball, what does it feel to have a gun in that as well? And it turns out it feels super weird. You have to, simply, to slow time for concentrating on the shooting. So, there's is like a balance act on how much attention you can take away from the platforming in order to give some other interaction but also keeping the platforming interesting. So, how do you do that altogether? So, that was like the challenge that I started with, and then everything else just expands from that. Like, once I had a concept I steal ideas from other games and tried to put them in my own, like jumping; 'oh, this is cool, Super Mario did that'. So, I do that in my game, and like, and then it all rolls on and on" - Ditto, 16.03.2017

Results also show that framing Ⓕ has among several of the interviewed designers a very special function. Through framing designers retransform the design situation they work on and especially their designs over and over again. So, if the interviewed designers were the car designers of the hypothetical example, they would have started with the objective of designing a sports car and halfway through the process would have reformulated their view, their plans and designs to make a chariot instead. Or they would have designed the sports car and while being in the assembly line would have removed the door and attached an airplane wing, and later on would have changed the whole frame of the car and would have replaced it for a boat's structure. Or they could also have started with an objective in mind and just on the fly and iteratively would have put together a car engine, the propellers of a chopper, the coachwork of a 1950's Volkswagen, and so on until eventually deciding "ok, this is it".

These ways of framing among the interviewed designers induce a very peculiar phenomenon regarding the "locking" of the design. Locking understood as sticking to one design and not changing its essence, and just focusing on producing it, on polishing it and tuning it, on making it ready for its release. Some of the designers do not lock their design at all or they do it after numerous design activities and already very advanced in their design process. Some others do not lock it even when designing levels or scenes, which means the level and scenes entail an expansion of the design instead of an extension of it. Within the design of indie games, the design is not set in stone and the designers keep on adding features and elements that change partially or completely what their games are about.

> *"Our design principle usually is: don't take anything for granted. Sort of, try anything and very often. We just strapped ideas we've been working on for months. If we find out that doesn't work and we just, we have a high level idea or principle for the game, and then we just sort of do anything with that as sort of guide host to follow. And, you know, as long as we are gradually moving towards this principle we're happy. Yeah, I may write up tons of game design documents of, like, specifics as we go forward, but none of those are written in stone, and 95 percent of the content isn't in the final game, often changes considerably. It's a very fluid gradual process of constantly reassessing. And I might wake up in the morning and then Matt says he found some issue with the design and I guess we gonna cut half the game. And it's, once you figure what the game is about it's a different design process; 'cos then it's just more minor detail, like, how do we make each individual element clean and fun. But that's basically how it works for a broad view"* - Justin Ma (Subset Games), 2.02.2017

> *"I sit down with the first idea I get and implement it; I make it happen in the game. Once implemented, oftentimes new variations to that idea pop up. Just as I said, I am programming and while programming other alternatives appear. Once that happens, there is the original idea and the other ideas that appeared in the process. Then it can happen I feel more appealed to one of those variations of the idea instead of to the original idea. And well, I thought, like, you go walking and then a bomb explodes. But probably it would be better to have monsters instead; then I take that direction. I implement things towards that direction and I am aiming at with the game; that's how new variations appear and I go choosing variations that seem to me more interesting"* – Daniel Benmergui, 30.01.2017

FROM KNOWLEDGE TO CONCEPT AND FROM CONCEPT TO KNOWLEDGE: IDENTIFYING WHAT THE GAMES ARE ABOUT

The previous chapter introduced *C-K theory* (Hatchuel, et al., 2003). From this theoretical standpoint, designing consists of a series of transformations of concepts, or propositions without a logical status for the designer, into knowledge, or propositions that are true for the designer, and vice versa. The outcome of the designing activity, the design, gets to exist once the knowledge of the designer is expanded by recognizing a proposition as true (☼).

For instance, a car designer can picture having an airplane turbine on top of a car. This idea would represent a proposition without a logical status for the designer, a concept; because the designer has to find out first through explorative work in which way this idea can be feasible to consider it as true. The designer would have to turn to engineering, physics and other disciplines to determine if having an object with such a great energy power as a turbine is something realistic on top of a car. As well, the designer has to ideate modifications either for the car or for the turbine in order to match the properties and characteristics of the two objects and yield a functional object.

By digging into already available knowledge and through prototyping, the designer would find out what is feasible, what is not, and what other alternatives or modifications to the original idea are

necessary to reach the goal. All this exploring, try-outs and studying of possibilities are what in *C-K theory* (Hatchuel, et al., 2003) is referred as expansions and partitions of concepts and knowledge through design operators. Eventually, the designer would find a proposition that becomes true according to the designer's point of view, objectives and working constraints. This proposition would constitute the design (☼), the outcome of the design activity, which could be then produced or in some circumstances already be implemented. In addition, this ultimate proposition (☼) represents new knowledge for the designer, because it entails detailed information on how to reach a goal and create a not-previously existing object.

For the design of games, this designing is visible in fragments of the accounts of Justin Ma (Subset Games). Table 6.8 presents at the left the narration of the designer about his design process and at the right the analysis and identification of concepts and knowledge in the narration. As well, the analysis of the accounts describes the design operators undertaken by Ma yield in terms of *C-K theory* (Hatchuel, et al., 2003): concept to concept (C>C), knowledge to knowledge (K>K), knowledge to concept (K>C) and concept to knowledge (C>K).

Scheme 6.8 Analysis of the accounts of an indie designer through C-K theory

"I'm just thinking, in general, coming up with game ideas. So, basically for us, making FTL, it's like, you picture a specific atmosphere or feeling that you want the player to feel. I want to feel like x, I want to feel I have like this type of power; I have this type of control. And then, so, you take that idea of you know, giving players a sort of feeling and you just look through media, through books, whatever. Basically, anything that interests, and then you say, well, that's interesting; can I make a game that sort of emulates that feeling? When I make, like, little tiny things myself, like Game Maker games and stuff, usually, what that comes down to is, there's this specific game mechanic I want to explore. And so, it's sort of bottom up instead of top down of just like. I really like, you know, the group of mechanics in this platformer, and if I, what situation would that be interesting in. So, that's another way that I would come up with minor game ideas. Another way would be to basically take things that you like from anything and put them together and see what it is like. With this new game, there's one game idea mechanic and then, I, really, like, over battling, and I haven't seen over battling anyone do something similar in ages. So, I, like, ok, I wanna see if I can see this sort of mechanic and jamming it with here, or a lot of FTL creation stuff was combining, like, what did I like about watching those first Battlestar Galactica episode? What was like managing crew in this board game? And what was that feeling in Spelunky where decisions really matter? You know, like, so it's just trying to take ideas and just put them together and just fiddle around and see until it's interesting. I think that's usually	Concept: *"a specific atmosphere or feeling that you want the player to feel. I want to feel like x, I want to feel I have, like, this type of power; I have this type of control."* This proposition without logical status is the one starting the design.

Knowledge: *"you just look through media, through books"*. These actions indicate the designer is expanding his knowledge (K>K).

Concept: *"that's interesting; can I make a game that sort of emulates that feeling?"* . To reach this question, the designer turned to recently-obtained knowledge to come up with a new concept (K>C).

Concept: *"there's this specific game mechanic I want to explore."* The designer uses the game engine both to get new concepts and to find out their feasibility (C>C and C>K).

Concept: *"I really like, you know, the group of mechanics in this platformer, and if I, what situation would that be interesting in"*. The designer comes up with a new concept based on game elements he has identified or knows from somewhere else (K>C). And when questioning the situation in which the mechanic would be interesting, the designer is ready to partition concepts into new concepts (C>C).

Concepts: *"take things that you like from anything and put them together and see what it is like … … … trying to take ideas and just put them together and just fiddle until it's interesting"*. To take elements from other games implies using already available knowledge and formulating it as concepts (K>C). The process of finding out their feasibility and coming up with a working design implicitly entails several design operators (C>C, K>K, K>C, C>K). When the designer finds out what is interesting, is the moment a proposition becomes true for him, when an element of the design is chosen. This |

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the sort of approaches that I come to with just general game ideas….

…if we have a new game design, you know, we're trying a new game mechanic, we're having this sort of city building elements or whatever. And then, with the assumption that this game design element would be in the game, or, I would write a bunch of ideas and just brainstorm: What does that mean about the unit? What does that mean about money? What does that mean about whatever? And I just keep going down and I'd just have a huge list and then like two days later we realized that that basic mechanic doesn't work and then so all that gets ignored. So, for me game design documents are a way to basically explore an idea further and fill up the holes so you can start seeing where the gaps in the design are. So, I can have a general idea but I wanna add fire too; and I try to think on all the fire weapons in the way it goes back to interact with other things. And maybe you´ll start, to see, you know some weaknesses in the design, or maybe you just keep seeing tons of new interesting ideas that come from it...

…so for example we have this sort of reputation system, or whatever. And then, we were analyzing, ok, it doesn't feel right, what does it add to the game? and if you take a step back and I just look at it from the distance, all it's doing it's effectively being money, it's money. So, if that's all that is, so why don't we just scrap the whole system and we use money? You know, or you, there's a lot of time that we, like, the FTL feel thing, the fleet counter, that was literally, we needed to add like a hunger clock to the game, like a rogue hunger clock. So what, so in what way can we do it thematically interesting that mechanically just forces you to move? We sort of break it apart. And what is this from the most abstract just basic sense? What is it doing to the player? So, for example, we had something like reputation, that is functioning, that is effectively money, and we also have a system of money, it's like, well, that is redundant. You don't need that! You can clean that up. You can make it clear to the player where the priorities are by, like, removing this sort of unnecessary elements; even if thematically they're very different. If mechanically they're operating in the same space, it's kind of bogging you down a little bit. But that also comes from our appreciation of extremely sleek clean minimal gameplay experiences, that maybe comes from a lot of board games and stuff. If you can say it any simpler, just so the simplest thing possible, do

consists of a transformation of concepts into knowledge; a concept is validated as a true proposition (C>K).

Concept and knowledge: the *"sort of city building"* element or the new game mechanic represents a concept. When the designer writes a bunch of new ideas and brainstorms, he generates new concepts (C>C). These concepts are influenced by the knowledge he already has available (K>C). And when the designer questions what each element implies in the game, he is turning to his knowledge to work out with the concepts (K>K and K>C).

Concept: *"we realized that that basic mechanic doesn't work."* This event implies the designer validated a concept (C>K) with the aim of turning it into knowledge. In the process, the proposition was found out as unfeasible.

The designer executes all the design operators (C>C, K>C, K>K and C>K) by working on design documentation as follows: there is a general idea for a game, a concept, and the designer partitions it into a new concept about having fire (C>C). This leads to new concepts about fire weapons (C>C) influenced by the knowledge base of the designer (K>C).

Concept: *"this sort of reputation system".* The designer turns to his knowledge to validate the concept (C>K) and finds in his knowledge base (K>K) a discrepancy that allows him envisioning the implication of the concept within the game in the form of new knowledge: *"all it's doing it's effectively being money; it's money".*

Concept and knowledge: the designer is working with a concept, the fleet counter, and finds in his knowledge (K>C) the need to add an extra element, the clock. Then turns to his knowledge for alternatives that could result in concepts making this feature thematically interesting (K>C).

Knowledge: *"You don't need that! You can clean that up".* The knowledge generated through the execution of design operators, allows the designers to decide on removing a feature.

Knowledge: *"our appreciation of extremely sleek clean minimal gameplay experiences, that maybe comes from a lot of board games and stuff".* The proposition refers to the knowledge base of the designer.

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the most clear, and then, once you have those mechanics, be clear. You can have fun with the atmosphere, you can have fun with the situation; but as the core mechanics has to be really parsed down. So most of, like, practically speaking, our development period is like a whole bunch of ideas at the very beginning and then the rest of time is just cut cut cut cut, just chop away until we get something very tiny".

Summary of the designer's design activities. He partitions concepts (C>C) that then are worked out and transformed into numerous propositions (C>K, K>K, C>C and K>C), until eventually a statement is validated as true (C>K) and becomes knowledge in the form of an identified design by the designer, which is expressed as *"we get something very tiny"*.

In term of C-K theory with a space for concept and a space for knowledge as explained in chapter 4 on design theory, these accounts by Justin Ma (Subset Games) are as follows in figure 6.9:

CONCEPT SPACE

C0: *"A specific atmosphere or feeling that you want the player to feel. I want to feel like x, I want to feel I have, like, this type of power; I have this type of control."*

C: *"there's this specific game mechanic I want to explore."*

C: *"that's interesting; can I make a game that sort of emulates that feeling?"*

C: *"I really like, you know, the group of mechanics in this platformer, and if I, what situation would that be interesting in".*

C: New idea to explore   C: New idea to explore

C: *"take things that you like from anything and put them together and see what it is like"*

C: *"fire"*   C: *"reputation system"*   C: *"clock"*

Concept   Concept

Concept

KNOWLEDGE SPACE

K: Notions on what games are about (rules, goals, procedures, play, etc.), personal beliefs and preferences

K: Looking through media and books   K: New knowledge and notions

K: Findings after implementing the mechanics in the game engine

K6: Identification of interesting mechanics in platform games

K: Notions on what games are about (rules, goals, procedures, play, etc.), personal beliefs and preferences

K: Finding out if something is repetitive or unnecessary or not a good fit within the design

K: *"our appreciation of extremely sleek clean minimal gameplay experiences, that maybe comes from a lot of board games and stuff".*

DESIGN: *"we get something very tiny"* in the form of a game, a simple functional mechanic.
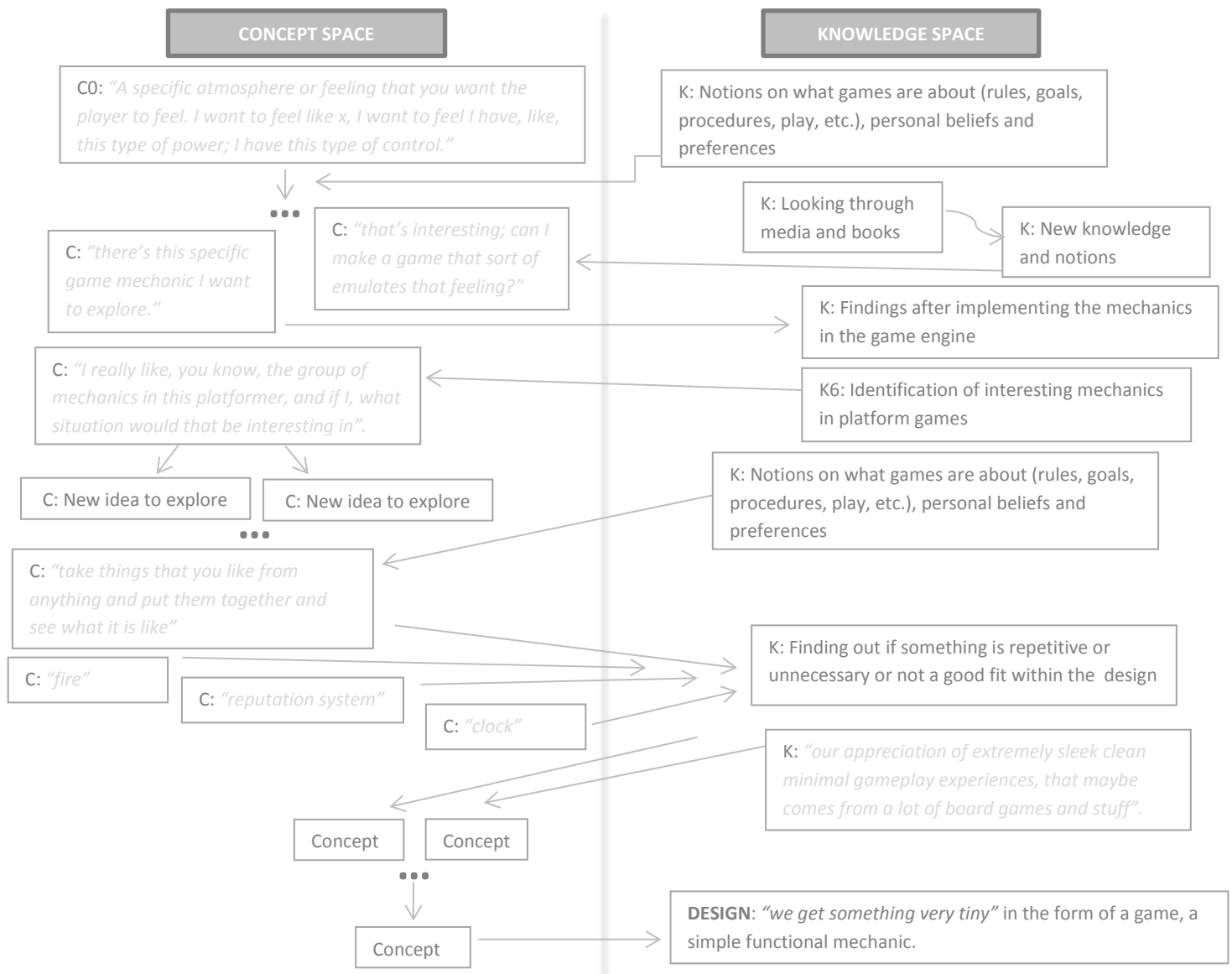
Figure 6.9 Excerpts of the design of by Justin Ma visualized through C-K theory

Figure 6.9 presents a visualization of excerpts of the design accounts of Justin Ma (Subset Games). The space at the left includes all the concepts or propositions without logical status for the designer. These are possibilities for the design. The space at the right portray the knowledge base of the designer, and all the new knowledge that is generated through several actions, such as looking through books and media and implementing concepts and finding out if they represent a good fit within the design, or if they are feasible. After an ongoing cycle of generating new concepts and expanding knowledge, the designer identifies a proposition as true, which represents what he calls "something very tiny", a simple functional mechanic in the form of a game.

The research shows that designers get to know or identify what the ultimate design of their game is about after having already been working on it for quite a while (☼). This, because their designing extends through different temporalities and because they do not lock their designs into a fixed idea. The most common moment for knowing or identifying the design ☼ among interviewees, was after exploring ideas on the engine and trying them out (ⒸⓅⒷⓉ), which yields an operating game unit. However, depending on the designers, some peculiarities and variations are identified

For some of the interviewed designers, there seemed to be a clear view of what their game was about early on; but through further design work such as researching or building the game and encountering new information or unexpected events such as bugs and glitches, what it seemed to be already the definitive game turned out to be something else and more concrete (----- ☼ -----☼). A few other of the designers opted for a game idea but ended up finding other ideas that shaped up the final game as something completely different (----- ☼-----☼). As well, while working on levels or scenes, games also got redefined. Some of the designers had defined their games already and while creating levels the games changed into different games; thus their games are both extended and expanded (----- ☼   ----- ☼); while some other designers once having their games defined, while working on levels, added new variations that changed the sense of the game but still left some elements untouched (----- ☼   ------- ☼).

> *"So I mean, part of that was like sort of, coming up with special cases, coming up with secrets to hide, coming up with, I call them 'gimmicks' sometimes, which is, a lot of people treat gimmicks as a negative thing, and I actually think they are pretty good. Was the time, I like the idea of like, coming up with sort of little one of interesting interactions that just make people play in a different way, just for maybe one level; it is just that I find that kind of fun. So, coming up with a bunch of those, it is like, way to, sort of explore the mechanics more. But all of that came on later. So it was, like the initial thing was, get the core of the first piece of gameplay, which is this network screen then get the core of the battle system, then get the two of them in a great and nicely.; then create like, you know, varying levels of difficulty of these systems. Then start exploring and more with gimmicks or other things. See, it is kind of mostly a process of expanding outward, and it means that especially for the bigger games it's not always clear what the whole vision, or what the whole game will look like, like, like I have the idea in my head of, like, could be good if I have the idea 'oh, you go to these individual networks that you flicked on the file system' and each one is kind of its self-contained world and... the game will basically will be doing all this, doing a big list of this. So, that is the vision initially, but that's super big, because it is not really talking about how it's each one different and like, how does the gameplay feel, despite the fact that it is basically just going through a list of battles. Ah... So, yeah, to answer your question more directly, I have vague notions of what the whole structure of the game will look like from the very beginning, but, until I am actually working on that stuff, they don't become less vague until I am actually working on them"* – AP Thomson, 6.08.2017

DESIGN METHODS AMONG "INDIES"

In the previous section, it was mentioned that the interviewed designers work with ideas that come and go, transform and evolve. Does this mean that a popular design method such as brainstorming is not applied by them? Do indie designers apply design methods in their design practice? Results show that the interviewed indie designers occasionally support their practice by applying design methods. Table 6.10 shows in the form of a word cloud visualization the most common design methods identified among the interviewed designers. The bigger the font the more popular among the interviewees.

The design methods presented in table 6.9 are positioned across two axes as follows: vertically, from the start of the design and all the way through the process towards the end of the design and the production of the game; and horizontally, from more heuristic to the left to more systematic to the right, as the continuum proposed by Daalhuizen, Person, and Gattol (2013) to analyze design methods. The size of the font for the elements in the table represents the frequency with which the design methods were identified among the interviewed designers.
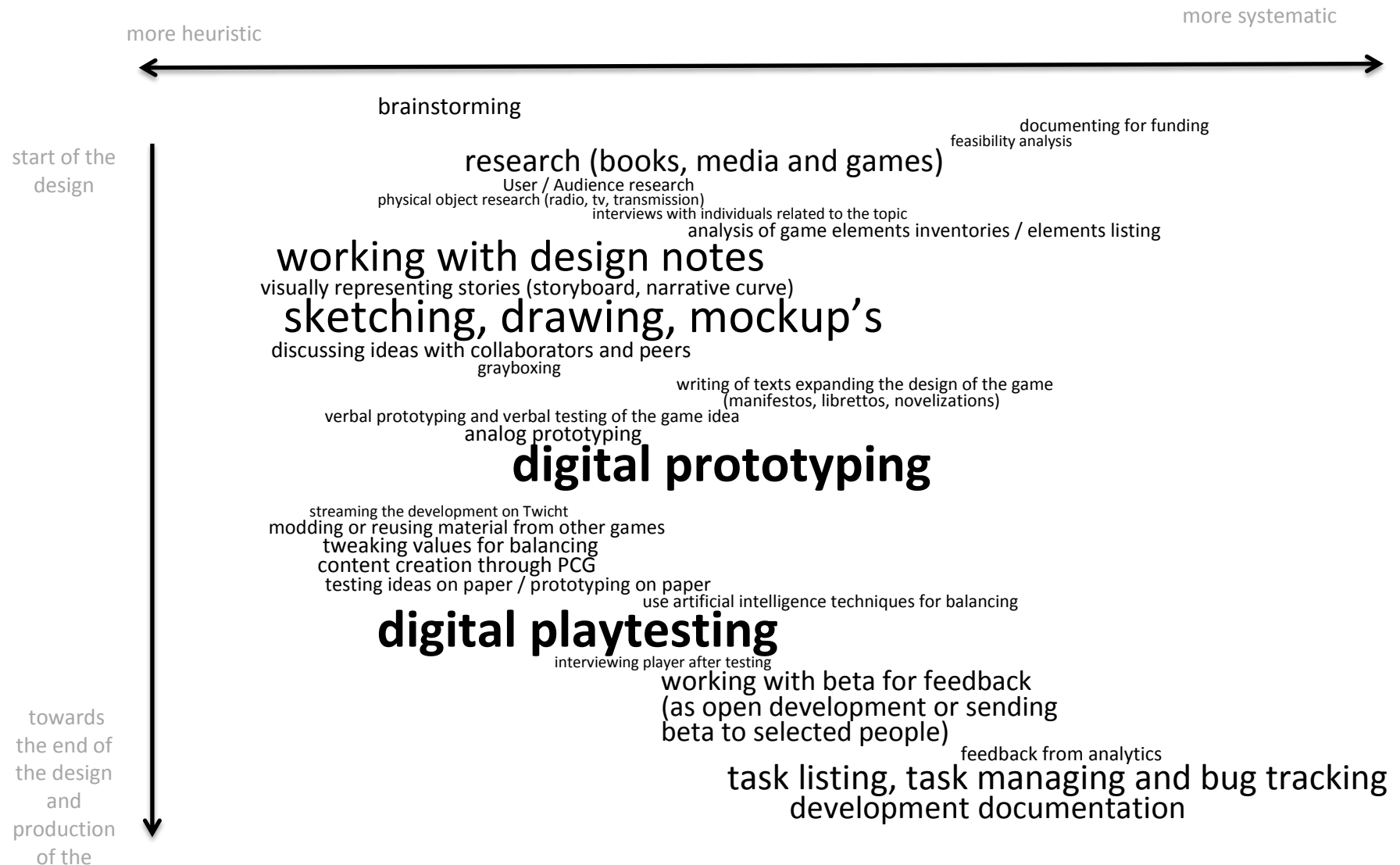
Among interviewees, design methods with heuristic characteristics are more diverse and numerous than those that are systematic. These design methods are more identifiable during the design of the core of the game, while conceptualizing, prototyping, building and testing (Ⓒ,Ⓟ,Ⓑ, Ⓣ). Design methods that are systematic are applied by designers as part of activities that imply managing and finishing the game. Even if the number of systematic design methods is relatively small, this type of methods is the most popular among indie designers. Systematic methods are applied by a larger number of interviewees than heuristic methods. For this reason, systematic design methods are depicted with a font of considerable size. In contrast, heuristic methods in the visualization are more in number, however, some of these design methods are applied just by very few of the designers; they are applied on an individual and particular basis.

> *"I do a lot of, like, story boards and stuff, and send those to the artist, and they all kind of work with the story board to try to do some concepts. So, for me it's like, gathering those interviews, gathering sort of some primary source material and then doing story boards"* – Nina Freeman, 10.02.2017

The distribution and representativeness of design methods in the word cloud leads to infer that during the design of the game, the designers work with information whose degree of specification is not decisive and that the goal to reach can be satisfying instead of optimal. While when managing the production of the game, which can include working with documentation, dealing with analytics and solving technical issues, to consider the most complete information about the design situation is very important as well as to reach optimal rather than satisfying results.

> *"Something I did a year ago, was, to write down all the game ideas I had in my head and then try to rate them on a few different aspects. One was, how much time I would think the project would take to complete, and the other was, how much I felt like doing the project; like, if I really wanted to work on it. The other one was how much impact I think the project would have, like, how original it would be and whether I would be proud of having that finished. Like, something that stands out. Do I think commercially it would be viable? Would it make some money? And something more like team size: Do I need other people to do this or could I do it by myself? And that is something that I now try to be more aware of; because my projects progress slowly or I notice I take quite some years to finish something. So, I better choose the right projects. So, I would say that is the big evaluation that I try to make. Ok, What am I gonna spend my time on?"* - Richard Boeser (Sparpweed), 21.06.2017

Table 6.10 DESIGN METHODS identified among designers of indie games

more heuristic   more systematic

start of the
design

brainstorming

documenting for funding
feasibility analysis

research (books, media and games)
User / Audience research
physical object research (radio, tv, transmission)
interviews with individuals related to the topic
analysis of game elements inventories / elements listing

working with design notes
visually representing stories (storyboard, narrative curve)
sketching, drawing, mockup's
discussing ideas with collaborators and peers
grayboxing
writing of texts expanding the design of the game
(manifestos, librettos, novelizations)
verbal prototyping and verbal testing of the game idea
analog prototyping
digital prototyping

streaming the development on Twicht
modding or reusing material from other games
tweaking values for balancing
content creation through PCG
testing ideas on paper / prototyping on paper
use artificial intelligence techniques for balancing
digital playtesting
interviewing player after testing
working with beta for feedback
(as open development or sending
beta to selected people)

towards
the end of
the design
and
production
of the

feedback from analytics
task listing, task managing and bug tracking
development documentation

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PHILOSOPHIES FOR DESIGN

ᄪᄪ⅃ @eelfroth · 21 jun.

game design is ideological work. by designing systems and mechanics you are codifying a world view. what ideology are you encoding into the game you are working on?

The designers of indie games have particular views and thoughts about designing and about what they want to express and achieve with the outcome of their design practice. As Bryan Lawson (2005) claims, these ideas also represent constraints within the design (Lawson, 2005). These outlooks are crucial to get a better understanding on the rationale behind the design activities of the designers. These visions deal with honesty, creating what is for the designers important and designing on their very own particular way. The following are some of the personal statements of the designers on this regards:

> *"I mean, I use the same kind of method that I use in a collaboration; to try to have the music and the visuals and the theatricality of the game harmonized. But at the same time, I'm trying to humanize a lot of different things. So, the Oikospiel, I call it an opera, because I'm trying to bring all these different things together. So, there's the music, there's the setting, there's colors, there's the story, there's the teams, there's, which have a kind of philosophical basis, and so. In that process, I was really, I mean, all my process is grounded in some kind of musical mentality, I think. So, even in Oikospiel I am trying to bring these different things together, it is really kind of like a tuning harmonizing process"* – David Kanaga, 30.06.2017

> [About game design] *"….they wrote books on how to make their game; but that's gonna never be your game. And if you take your idea and wedge it into that it's gonna be their game. It's like, the best way to do this is to forget it, go make your own game! I feel, like, overcomplicated when it´s your iteration. Kids are so good at making games. They come up with ideas, like 'no, you don't do that, that's how you do it, no, that's not the rule'. Like kids, they switch off the rules all the time, but they're making games. You know. So, how did we forget about that? And we now need rules and big things to teach us something we knew already from childhood being already that small? Forget it! Stop over planning! Stop overanalyzing! Just start with a basic interaction that really interests you! It seems, like, a lot of the indie success stories from all the talks, that's what they did".* – Nathalie Lawhead (Alien Mellon), 31.01.2017

> *"All the games are built for ourselves. They're built for us, and then basically, if we like them, then we like, we make them accessible. You know what I mean? People can understand how to play it, but it's not built for other people, because I believe that doesn't work. And plus, the big thing is, if your game fails; let's say you're building it for someone else, right? But you don't like the game, then if it fails with the other person, then you end up with the game that you don´t like; I don't think it's possible to build a game for someone else. Or, if you do that, you're gonna end up with, someone who built it better than you. It's like; I'm not being pretentious here. It's when you're getting into kind of music and art, right? You try to build art just to, like, make a painting that impresses everybody, but you don't like it. I don't understand that. It's like, you build it, you make it for yourself, and then you try to hopefully connect with an audience and make sure that they understand it; like, make sure that they can see it. But then, your job is done, because, otherwise, you're just bringing something into the world that no one needs. 'I built something that I thought people that like Super Mario can play'. It's like 'ok, you like it?' It's like, mmnnnnno! I don't really care. We don't need, no one needs that."* – Jim McGinley (Big Pants), 13.07.2017

> *"It's not my games bleed over into the real world, the interesting happens in the real world. The game as a digital object, physical object, exists not to be the center of attention, but to support the play, the social interaction, what people are doing. I'm making games that would encourage people to have interesting moments in those kinds of situations"* – Alistar Aitchenson, 18.12.2016

> *"I keep saying there isn't a goal, or I don't want there to be a goal. But in reality there is a goal in the game, but it's sort of. I can try to think of another example, I don't know, I feel like, I have a very, like, this specific thing I'm trying to do. But it's more like, I keep relating it back to, if somebody was on a hike, or if they were kind of in, you know, somebody is hiking and it's sort of more like, how do people determine, whether, what they point at, like a point of interest, they're hiking, and they see something. And they wanna, like, go try to get to that place. And then, they try of, short term… like, if you covert it into a game. Like, the short term objective would be: how do I get up to that cliff? Or that point on this hill. And then it's*

about finding a path and kind of navigating there. So, it's sort of what the game, the goals are in the game. But the game should never tell the player, like, where to go. But, it's interesting because I still, in a way, I still figuring it out, but, it might change. I think it's kind of, what I'm hoping. I will be kind of, like, a way of proving something, not proving my ability, but proving that there's just a different approach to games. Like, so, for example, Proteus, is a good reference point of a game that has no goal and you kind of, it's focused on that and it's also focused on the music being kind of dynamic and procedural, and then kind of it's based on what you're doing... with this project I wanted to, like, serve as sort of like a guide post, or like a marker of, like, 'hey!, there can be other games that are kind of this way' and maybe people will be inspired and want to, like, go in whatever direction they see as the game being in" – XRA (Ezra White Hanson), 29.06.2017*

"I think it's really important that everyone has their own definition of what a game is. Just so they know what they're making. One of the biggest problems, and sorry that I'm very happy in terms of, like, cutting out unneeded features, is, that I 've even had, like, AAA studio heads kind of told me this thing I've made isn't a game. And I don't do it rudely or anything, but I kind of explain to them my definition of a game, and I kind of ask them what theirs is. And it turns out that some of them just don't have one. You know, they're, they've been around long enough that they just kind of expected to be certain elements in the game and they really haven't thought critically about why we include this. And they've just always done it, so it's this weird kind of split" –James Earl Cox III (Seemingly Pointless), 13.01.2017*

"I think where you find success with that is staying true to that idea. Because, when you think about it, if we' re making the game that we have in our minds, the best way that we can do that is to be as truer as possible. Because we are the best deliverers of that idea; because it's the game that we have in our heads and the game that we want to exist. So, we're the best at making that thing. So, it makes sense that we should do our best to do that right, because this is our particular thing that we can give to people. And if they have a similar sort of mindset as us, then they'll probably really like it, 'cos we've done the thing that we think it's most honest to our own ideas " – Matt Meyer (Super Chop Games), 31.01.2017*

CONCLUSIONS: DESIGN STYLES AMONG DESIGNERS OF INDIE GAMES

Design style was defined in chapter 4 on design theory as the sets of features or patterns identifiable in the undertaking of design (Chan, 2000). Design styles come from personal preferences, personal knowledge and mental models of the designer as well as from the rules and procedures of the domain in which the designers perform their practice. Individual traits of the design styles of the interviewed designers are summarized in Appendix A.

Nevertheless, as a group of people with a common design practice, the interviewees also feature patterns representing shared or common design styles. These design styles are the characteristics and peculiarities of the design of indie games presented throughout this chapter. In fact, only through the understanding of these characteristics the whole dimension about the nature of the design of indie games can be reached.

This research found the following design styles among indie designers of games:

a) The design revolves around what is personal to the designers.
b) Designs represent self-structured or collaboratively-structured projects without determining constraints.
c) Designers design games with an objective in mind but also occasionally totally goal-free.
d) The role of the player is to verify that the games are playable, understandable and accessible.
e) The different design activities (Ⓒ,Ⓟ,Ⓑ,Ⓣ,Ⓐ) for the design of indie games have multiple connotations. Especially conceptualizing Ⓒ, prototyping Ⓟ and building the game Ⓑ share many traits in common.
f) The locking of the design varies greatly: once knowing what the design of the game is about (☼), designers do not lock their design; instead, they continue designing. The design of the games

experiences continuous transformations. The designs of the games are not only extended, but also expanded into different and newer designs.

g) Due to representing what is personal to the designers, the design situations (ℷ) around which the designs revolve are self-formulated and even oftentimes not formulated.

h) Multi-temporality of the design: the design is not limited to having an idea and then developing it. Among indie designers, ideas and designs come, go, mature and transform numerous times. For this reason, the design of some games cannot be comprehended as a lineal operation. An idea for a game could have had its origin years before and then due to several events, learning and decisions, it could have evolved until eventually shaping up a game.

i) The design can be influenced by spontaneity instead of being forcedly triggered.

j) Prototypes and game builds constitute design canvases: instead of representing implementations and visualizations of design ideas and decisions, prototypes and builds are the contexts designers use to conceptualize.

k) The design of indie games is part of a continuum. There is neither a specific start nor a specific end; it is rather a continuous activity.

l) The indie design practice is supported occasionally by applying design methods; heuristic design methods for the core design activities and systematic design methods for the managing of the design and finishing the game.

m) Designers undertake their design practice with particular views influencing their work and games. These outlooks revolve around honesty, artistry, staying true to one self, designing games on the designers' own way and creating what is of the designers of interest[69].

> *"A huge part of the process, I mean, I worked on the game for probably about two years, about a little over that. And probably, about a year of the game was just play. I would get all these things and I would just play, really, like, it was a computer game. Like, my dream computer game, I would get these things and then would go, 'oh, how can this change? How can I play with them? What kind of music would I have? How can the music change? How can the cameras change? How can the lighting change? How can the environment itself change with all these scripts I have?' And it was just play, just like pure play. But then it kind of gradually tipped more towards the work of it; where I would, at getting an idea, I would play and I would say 'I'm gonna make this change. I'm gonna color it blue and then I'm gonna add blah blah blah blah blah'. And then, I would be, 'oh no! I just got a big idea I wanna have this piece of notation inhere that has different trigger zones that are gonna play all those kinds of different notes based on what the notation looks like, or based on what the notes are blah blah blah'. Basically, sometimes I get ideas that would require a lot of labor to complete. So, the second year of development was much more laborious and there was still play but there was a lot of, like, to do-lists. So, like, year one, a lot of play, didn't know what was gonna come out of it. Year two, wanted to squeeze it into a complete design. And so, a lot of work, to do-lists, a lot of plans, a lot of goals. So, that's in general something"* – David Kanaga, 30.06.2017

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[69] The interview transcripts were also coded and analyzed using as theme of analysis Bryan Lawson's and Kees Dorst's (2009) model on design activities, which consists of *formulating*, *representing*, *moving*, *evaluating* and *managing*. However, this model was discarded to be presented as part of the results and visualizations of this chapter because *C-K theory* (Hatchuel, et al., 2003)provided a better understanding around the activities designers undertake than Lawson's and Dorst's (2009) model.

CHAPTER 7: THE DESIGN OF INDIE GAMES, A DIFFERENT PARADIGM

"Navigating this freedom is the ultimate challenge for the fine artist; there are not ´requirements´ for art. While design is always to some extent grounded by functionality, by the obligation to relate to the needs of people and requirements of stakeholders, art is not functional; it does not need to make sense. Artists are more or less on their own having to develop a personal and interesting starting point for the production of their works" (Lawson, et al., 2009 p. 41).

This chapter aims at answering the research question of the dissertation and presenting the concluding remarks of this research work. The structure of the chapter is as follows: the first section consists of a comparison between the design of indie games and game design based on the results presented in the previous chapter. The comparison revolves around portraying the design of indie games as similar to an art practice and game design more as a commercial design practice.

The second section of the chapter turns back to some theoretical standpoints discussed in chapter 2 about indie games, in order to assess the design of indie games as inherent within indie cultures. The chapter continues by analyzing and discussing the contributions of this dissertation to game studies, as well as by suggesting potential lines of future work on design research in the discipline. The text closes with the conclusions to the whole dissertation.

DESIGN OF INDIE GAMES, AN ART PRACTICE

As this dissertation approaches its end, the research question resurfaces to be finally answered and discussed: in comparison with game design and based on the design undertaken by the designers of indie games, does the design of indie games represent a different paradigm? In order to answer this question, this section will discuss the results of the research from Bryan Lawson's (2005) view on the boundaries between design and an art practice.

ELEMENTS IN COMMON

According to Lawson (2005), both in design and in an artistic practice, practitioners engage in the same design activities. Practitioners of both design and art follow diverse lines of thought while doing their work. These practitioners find a convenient way to undertake their practice in the externalization of their ideas through design methods. And in both scenarios, design and art, practitioners bring their personal views into the creation process (Lawson, 2005).

These similarities that Lawson (2005) mentions between design and an art practice are present in both game design and the design of indie games. First, both revolve around the same thing: games. Second, they both entail the undertaking of design, reason why the theories from diverse design disciplines were appropriate tools for this research. Besides, as it was already stated in chapter 4, design is the same creative process in all fields (Gregory, 1966)(Lawson, 2005). Both for game design and for the design of games it is

possible to identify design actors, their roles and constraints. Also, both game design and the design of indie games imply *problem-solving* (Simon, 1996) and *framing* (Dorst, 2015).

Furthermore, design methods are present both in game design and in the design of indie games. Game design literature presents a series of design methods[70] to support designers in their practice, which include matrixes, charts and diagrams (Perez D, 2018) presented in chapter 3. Designers of indie games also occasionally apply some design methods in their design practice. And even if game design is just a general view around the creation of games in game industry contexts, it also entails that practitioners subscribed to this construct design games influenced by their very personal views. As for the design of indie games, it has been shown that indie designers do have their views and outlooks about design influencing their practice.

DIVERGENCES

Nevertheless, despite the common design activities, design methods and the influence of personal views while undertaking design, game design and the design of indie games pose several points of divergence. Lawson states (2005) that in spite of sharing similarities, what differentiates design disciplines are their constraints, methods and procedures. Based on the results of this research, the discrepancies between game design and the design of indie games are easily identifiable.

On the one hand, game design entails designing with rigid and flexible constraints from players and from publishers, design actors who strongly influence the design process. Game design also prescribes a series of views about the design of games, the game design contributions. And even if these formulations by academics and game industry veterans have been scrutinized for their lack of support for the actual design of games (Järvinen, 2008)(Neil, 2012) (Orita Almeida, et al., 2013) (Librande, 2010), they provide schemes to follow for game making. They intend to provide insights on how games can be understood and analyzed in order to be also designed. In addition, game design consists of definitions, structures and limits for each of its activities: conceptualization, prototyping, playtesting and documenting (see chapter 3).

The design of indie games, on the other hand, mostly entails constraints that are not rigid or determining; these constraints vary, change, and come mainly from the designer. Since indie designers work on projects that they structure themselves, they have the possibility to define the limitations and specifications that shape up their process and at the same time are able to restate or modify those limitations or specifications. The design of indie games is flexible and adaptable.

The design of indie games encompasses a particular setting of design actors. The most important actor is the designer instead of the player. Other design actors such as publishers, clients, third-party organizations, have at the end very low relevance within the whole design activity of the indie designers. These designers enjoy a big amount of power to decide on their design. Oftentimes, designers also share that power with other designers, they co-design their games together.

The design of indie games relies on working with a larger number of elements for the creation of games than the ones considered in game design literature. As well, the way in which these elements are worked with is different. While game design is mostly mechanic-oriented, the design of indie games is not only

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[70] These design methods should not be confused with game design contributions. The practical use of game design contributions was already discussed in chapter 3, so that is clear which game design contributions actually constitute design methods. Moreover, an extensive theoretical explanation of the term design methods is presented in chapter 4.

focused on mechanics but also on images, sounds, emotions, among other elements, and finding for these inputs proper interactions and mechanics. Thus, the design of indie games would not only involve a similar approach to the one suggested in game design with the name of the *MDA framework* (Hunicke, et al., 2004). It would also imply diverse approaches, such as total opposites to the *MDA framework* (Hunicke, et al., 2004) or other kind of mixed ways of game making.

The design of indie games also consists of its own interpretations of the activities for the creation of games in a way that does not totally match the definitions of game design. Conceptualizing, prototyping, building, playtesting and documenting share many characteristics among each other, to the point that they get to overlap, include each other, lead back to each other, or even become synonymous. As well, within the design of indie games, design activities are not sequentially strict. Indie design takes place through different moments in time and at different situations, and oftentimes there is not an end for the design process, it just continues or becomes the design of a different game.

On this regard, a very important and distinctive characteristic in the design of indie games and that does not fit at all game design is the role of spontaneity while conceptualizing. Game ideas, around which the design of indie games revolves, are not induced or sought because the designers have to come up with a game. The ideas come freely to the designers; the designers gather spontaneous ideas and leave them there to rest, until those ideas eventually start shaping up a project to work on. Exceptions to these cases are events or situations like Game Jams, funding opportunities or commissioned projects that trigger the design process. But besides these, the design of indie games is influenced by and flows because of spontaneity.

Design methods in game deign and in the design of indie games also show a big difference. Since game design entails meeting the goals of the publisher, meeting the needs of the player and communicating with the team developing the game, design methods that are systematic gain more relevance. These design methods are the ones that consider the most complete information about the design and aim at reaching optimal rather than satisficing[71] results (Daalhuizen, et al., 2013). Hence, the most predominant design method within game design with these characteristics is the writing of game design documents.

Conversely, within the design of indie games, design methods are applied occasionally. Especially for the core design of the games, heuristic design methods are the ones that are more visible, but only as support of the design practice and not as the drive for it. In fact, besides prototyping and playtesting as design methods, indie designers undertake the creation of games with moderate to minimal use of heuristic design methods.

The focus of heuristic design methods and their very individual use for the core design of the games within the design of indie games indicates several particular characteristics of the practice. First, within their free practice, lacking of rigid structures, the most convenient ways to externalize their design thoughts is through prototypes and builds. If they need to try out ideas they can work directly on the engine. And second, the design of indie games is flexible, open and embracing change and variations. Within the core design of indie games, paying high attention to detailed information and aiming at meeting an optimal solution as in game design is not a priority. Instead, in case of applying heuristic design methods, the aim is to find a satisficing solution. There is no need to observe information in detail or to treat it with rigor.

Nevertheless, systematic design methods within the design of indie games are not out of the picture. These design methods are the most popular within this design practice; they are just not that relevant for the

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[71] The term satisficing was introduced in chapter 3 as an adaptation of Herbert Simon (1973) to the word satisfactory, to refer to the limited capabilities of humans to find optimal solutions to problems in comparison with computers.

most creative part of the design of the game. Systematic design methods apply for activities that deal with communicating with coworkers or with external individuals like funding institutions, as well as apply for managing the development of the game. This implies that getting the financial and promotional resources for the development of the games and working towards the release of the game are activities for which reaching an optimal goal is important within the design of indie games. To position the game in the best way possible out in public is a relevant issue within the design of indie games.

FUNCIONALITY VERSUS FREEDOM

While distinguishing disparities between design and an artistic practice, Bryan Lawson (2005) focuses on functionality and freedom. While design and its outcomes tend to relate to a market, an artistic practice represents to its practitioners relatively more freedom to pursue their own interests and the possibility to work within a loose structure or context. From this theoretical standpoint, game design fits more Lawson's vision of design while the design of indie games fits more an artistic practice.

Game design is more grounded to functionality than to freedom. Game design is a game industry construct (see Chapter 3); it relates to a market and to the specifications and needs of the stakeholders that configure such a market, the publisher and the player. Game design has the player as its main focus (Fullerton, 2008), who is, in the market, the consumer to satisfy and whose expectations have to be met. This setting represents a reduced freedom for the design of the games, for the designers. Game design consists of aiming at reaching the most optimal solution in order to satisfy players and publishers. Game design is triggered by structures and actors of the market.

Additionally, game design is a staged-based, structured and well-defined process embedded in the workflow of the game industry. Also, due to the industry's logics that may include costs or working within an industry-alike pipeline, game design implies a practice that is precise, detailed, time-specific, opportune and rigid. The design starts with a goal to be met; once conceptually developed, the design has to be visualized and tested through prototypes; and once adopted, the design is locked in its form to then be produced.

The design of indie games is more similar to an artistic practice than design due to its high degree of freedom. The design of indie games revolves around what is personal to the designers. This type of design is about creating games that the designers like, games that the designers consider not to exist out there; it is making games for the sake of making games, exploring topics, exploring games as a medium and their potential, probing through the design of games that other forms of games are possible, embodying stories, presenting other people with procedures or interactions that interest the designers; it is also exploring the designers' own creativity, making personal statements, collaborating with other people to create something and getting people to play the ideas the designers want and feel for.

The design of indie games represents a lot of flexibility regarding the direction of the design of the games. Indie designers not only can set their own goal, they can also decide how deep to explore what they are working on and for how long. This is a privilege that commercial design practices hardly afford due to deadlines to meet and costs to pay. Also, indie designers can design games without a specific objective; the design can be goal-free, totally explorative. The designers are free to navigate seas of possibilities; they can change their mind on what they are working on. They can opt not to get fixed with a design idea, to lock it, to instead let other alternatives arise or allow ideas to transform into something new over and over again.

Moreover, within the design of indie games rigid structures and sequenced procedures are not relevant. Instead, design activities can be reinterpreted and have new meanings, allowing designers, for instance, to conceptualize games while working on the engine, either while prototyping or while already making the game, while building it. Prototypes and game builds are canvas for the creation of games. Documentation oftentimes also consists of part of the design of the game, it is an element without which the indie game is incomplete among its publics. The different design activities in the making of indie games represent creative contexts.

The design of indie games is not triggered by market needs. Instead, it flows on ideas that spur of the moment come to the designers. It is more spontaneous than led, at least at its beginning. Ideas come to the designers freely and evolve likewise. This leads to visions on design among indie designers as if it was the game taking its own course. Through the process, designers may let ideas settle down and morph into new forms or the designers may explore through the undertaking of different design activities and occasionally by applying design methods new possibilities.

Additionally, the design of indie games does not have the same market focus as game design. On the one hand, this design consists of what is personal to the designers of the games. And on the other hand, the role of the player is to validate the game, to verify if the game works and if it is understandable. This is very similar to what happens within artistic practices, where artists put out their work, and this work originates from the intrinsic motivation of the artists. Also, when the work of the artists is out, it is there to appeal to those people who identify with it, instead of consumers of a commercial market. This way of designing agrees with the outlooks of the designers of indie games, which revolve around honesty, working on their very personal visions and definitions on games and designing the way the designers feel right to do it.

Figure 7.1 presents a comparison between game design and the design of indie games. The figure portrays at the top elements that imply the undertaking of design activities mentioned by Bryan Lawson (2005) as common between design and an artistic practice. The rest of the elements in the figure depict the characteristics that have been discussed in this chapter as proper to game design as a design practice and for the design of indie games as alike an artistic practice[72].

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[72] Despite the design of indie games shares too much in common with an artistic practice, it still implies designing. It should not be undermined as not designing. Just as other art practices and design itself (Lawson, 2005), the design of indie games involves undertaking design activities. Due to this, the theories from design disciplines used in this dissertation where compatible and appropriate for this study.

Following several lines of thought

Applying design methods

Problem-solving (Simon, 1996) and *framing* (Dorst, 2015)

Designers bring their personal views into the processes

GAME DESIGN

DESIGN OF INDIE GAMES

Rigid constrained-based

Permeated by spontaneity

Framed within rigid structures

High degree of freedom

Grounded and related to a market

Revolving around what is personal for the designer

Player-focused

Goal-free / explorative

Priming optimal rather than satisficing design results

Priming satisficing rather than optimal design results

DESIGN

ARTISTIC PRACTICE

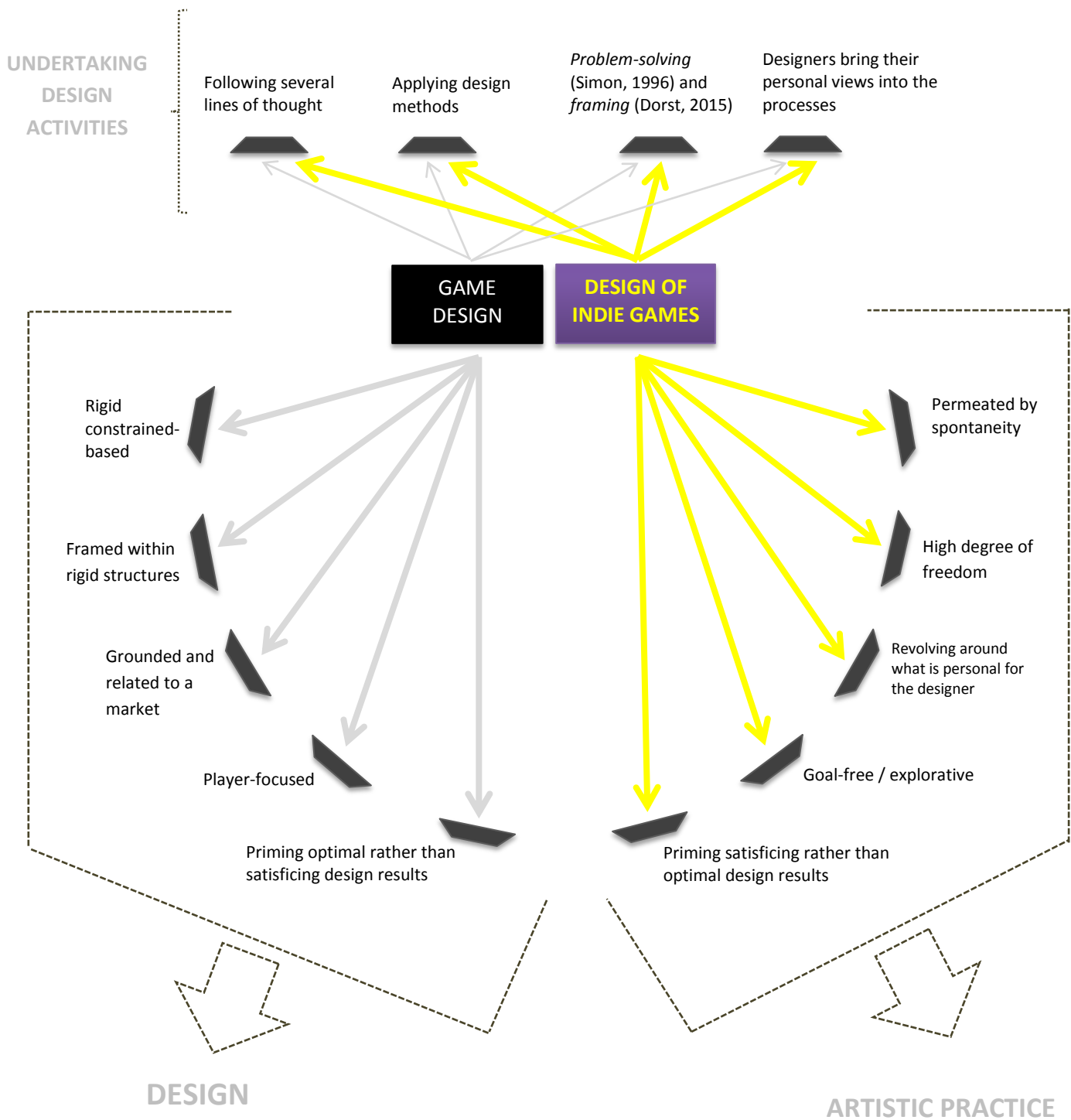Figure 7.1 Comparison of characteristics between game design and the design of indie games.
The figure expands Bryan Lawson's (2005) theoretical standpoint on the boundaries between design and art by including the results of the dissertation in order to show how game design tends to be more akin to a design practice, while the design of indie games tends to be more similar to an artistic practice.

THE DESIGN OF INDIE GAMES AS AN INDIE CULTURE'S ELEMENT

The design of indie games has been profiled as similar to an artistic practice. Yet, the indie nature of this kind of design should not be excluded as part of a proper understanding of the phenomenon. Since the design of indie games consists of designing games that are personal to the designers, navigating through design with freedom and designing without structural impositions, represents the perfect means for crafters to explore their creativity and expressiveness, such as Kara Oakes (2009) describes in her accounts for indie cultures.

Moreover, just as crafters and participants of other indie cultures do (Oakes, 2009), the practitioners of the design of indie games can work on their creations and control their processes while not having any commercial purposes. For this reason, within the design of indie games the main actor is the designer and the object designed. Thus, the design aims at reaching satisficing solutions instead of optimal solutions, and also for this reason meeting needs of other individuals such as the player are not relevant.

The design of indie games also relates to the *Do It Yourself* movement (D.I.Y.); however, not from the perspective of commercially convenient discourses presenting game engines as relatively free and available to game practitioners; a situation already discussed in chapter 2. The design of indie game shows characteristics of D.I.Y. (Lowndes, 2016) (Duncombe, 1997) in the sense that it is about creating games on the designer's own terms, without leads and according to their own initiative. Besides, it implies networking, the collaboration with other designers.

Chapter 2 presented a couple of theoretical standpoints about the term *alternative media*. A media that pushes for pluralism in political and artistic ways without necessarily opposing mainstream media (Atton, 2002), and as a hybrid media meshing the established and the free but still conferring voice to unrepresented groups of people (Guedes, et al., 2007). The design of indie games implies the design of *alternative media*. It is medium that allows its practitioners "raise their voice" by creating the games that in commercial contexts would not exist, or games that have been already created but still can be reinterpreted.

Bart Cammaerts and Nico Carpentier (2007) argue that *alternative media* does not have to be counter-hegemonic. This also applies to the design of indie games. In several ways the design of indie games and game design share traits and characteristics. This is especially the case of few of the interviewees of the dissertation, who also take commissioned work. The indie design practice can be more alike game design and focus on the player and work with rigid constraints under certain conditions. This fits Paolo Pedercini's (2012) vision on indie games as a phenomenon projecting itself in a continuum with mainstream games and gradually separating away from commercial and established structures towards freedom (chapter 2).

Paolo Ruffino (2013) claims that indie games represent a new dynamic of mass production within the game industry, in which game companies avail on the free labor of indie practitioners. This dissertation did not focus on money flows nor paid attention to the distributions of the designs indie designers produce. Hence, it is not possible to expand exactly the same discourse and focus presented by Ruffino. However, what the dissertation found is that, at least during the design process, the meddling of other actors that could benefit commercially from the work of the indie designers is limited. This entails that the design of indie games is predominantly free and the commercial benefits other actors may seek in it do not have a strong impact on the conception of indie games.

The design of indie games as depicted through the results of this dissertation can imply a lot of work by its practitioners, as labor (Ruffino, 2013). However, the design of indie games also implies play. In *Man, Play*

and Games, Roger Caillois (1958), provides numerous examples of people playing, especially children. Children imitating serious activities of adults, children making games and playing out of nothing, and children inventing their own games and inviting other children to play those games made according to their own terms.

Even though Caillois' (1958) most descriptive examples revolve around children, play is universal (Brown, 1991), and apply as well to adults (Sutton-Smith, 1998), such as the designers of indie games. Just as in Caillois' examples, these designers make games inspired on mainstream games they like, which were part of serious business strategies. The designers also put out their own versions and interpretations of what a game means to them; the designers make out games and playful experiences out of whatever they get input from or feel appealed to. And they also design games to make themselves play and make other people play.

IS THE DESIGN OF INDIE GAMES A DIFFERENT PARADIGM?

The time has come! Time to answer the research question of the dissertation: based on the design undertaken by the designers of the so-called indie games, does the design of indie games constitute a different paradigm compared to game design? The dissertation kicked off with this hypothesis: the design of the so-called indie games and game design represent different paradigms of design. Under the logic that the former questions the most underlying assumptions upon which game design is based, such as designing under determinant constraints, designing with the player as main focus, and following formalized and rigid design structures and methodologies. The design of indie games does not comply with such traditions and principles so characteristic in game design. The design of indie games revolves more about personal interests and freedom while designing. Thus, the hypothesis was proved correct.

Based on Ian Hacking's (Kuhn, 2012) connotation of the term paradigm, the design of indie games and game design constitute different paradigms. The design of indie games has different principles, ideals and methods compared to game design. The former implies navigating to great extent freedom, revolves around what is personal for its practitioners, and it is mostly heuristic in its core practice. The latter is staged, rigidly-structured and well-defined, implies rigid constraints, revolves around the needs and specifications of game industry's actors; the player is its main focus, the target market to satisfy; and it is systematic, in the sense that aims at obtaining the most optimal results through its process. Thus, the hypothesis has been proved as true.

It is worth highlighting the reason for the divergence between the design of indie games and game design. Because, even if the design of indie games has been depicted as similar to an artistic practice, as inherent to indie cultures and an as play, it should not be addressed as a lower category of undertaking design than game design. Just as Bryan Lawson (2005) states, there is no right way to do design.

Game design is formulated around game industry practices and conventions. Game design does not encompass a theoretical standpoint on the design of games as an innate human activity, for the making of games in all contexts, either non-commercial or commercial. This theoretical view has not existed yet within game studies. Only with such a standpoint, it would be possible to find out if game practitioners who affiliate themselves to a particular movement, such as the indie movement, feature in their way of undertaking design due to their ideology, divergences in comparison to a general theory of game making. Until such approach is formalized in game studies, the present dissertation represents the best way to explain the design of games as a human activity.

CONTRIBUTION OF THE DISSERTATION WITHIN GAME STUDIES

The dissertation has identified, discussed and illustrated the most underlying characteristics of the design undertaken by indie designers for the creation of their games (chapter 6). By formalizing the design of indie games, the dissertation also addressed recent academic concerns (Neil, 2012): after several decades of game design and especially game studies as a discipline, how is actually the design of games in practice undertaken? How do designers support themselves in their practice and what impact have game design contributions had so far? Based on the knowledge provided by this dissertation, the discourses in game studies around the design of games, including teaching practices, can be reformulated in order to meet the contemporary panorama of game making, so strongly defined by indie designers.

The elements designers work with to make games have been unveiled. The dissertation shows designers get inspired and work with a larger number of elements than those game design literature considers. Designers not only make games focusing on mechanics but also on images, sounds, emotions and feels. This knowledge can broaden the design perspectives in game studies so that not only mechanic-oriented approaches like the *MDA framework* (Hunicke, et al., 2004) are promoted, but also other diverse and varied approaches. As well, it can be acknowledge that play and games can come out of almost anything, just as Caillois (1958) argues with his theory of play.

The dissertation has also laid down the foundations for the understanding of the design of games; not as a series of industry practices and conventionalities as game design represents, but rather as theoretical standpoints on what designing games as an inherent human activity entails. The epistemological views about design in games studies were very limited, for that reason the theoretical framework of this dissertation was constructed with input from other design disciplines. The dissertation turned to engineering, architecture, product design, and design as a field of inquiry to find theoretical explanations to the phenomenon of designing.

Theoretical standpoints around the concepts of design problems, design solutions, designing, constraints and design actors have been extensively discussed. These terms have been put in the perspective and exemplified within the field of games. As well, the term design method, which has been arbitrarily used in game studies to refer to any kind of game design contribution, was also clarified; and by doing so, the design methods within game design literature were pointed out.

The dissertation has also addressed the dilemma of the two paradigms for design and their implication in the practical design of games, *problem-solving* (Simon, 1996) and *reflection-in-action* (Schön, 1983). The dissertation clarified the theoretical misconceptions about these terms by stating how similar both views are: whereas *problem-solving* (Simon, 1996) represents a positivistic approach to a situation, *reflection-in-action* (Schön, 1983) entails a constructivist approach. Moreover, the dissertation also argued that *reflection-in-action* (Schön, 1983), a view that has strongly permeated design discourses in game studies (Salen, 2007)(Salen, et al., 2004) (Kuittinen, et al., 2009) (Kultima, 2015) (Kultima, et al., 2010) (Lankoski, et al., 2017), is in fact, not an appropriate theoretical standpoint to explain design.

Yet, due to the relevance of the dilemma of the two design paradigms in game studies, the research addressed the two approaches for the execution of design, *problem-solving* (Simon, 1996) and *framing* (Dorst, 2015). Besides explaining that the opting for either one or the other approach depends on the design context and especially on the skills, knowledge and style of the designer (Dorst, 2015); it is noted that both approaches are inherent to design. Designers do both *problem-solving* (Simon, 1996) and *framing*

(Dorst, 2015) simultaneously or intercalated while designing. The research confirmed this by identifying in the accounts of the interviewed designers both approaches.

The theoretical views and results about design approaches open the door to a new dimension for the study of design within game studies: to considering *problem-solving* (Simon, 1996) as an existing and valid approach for the design of games. An approach that can be reflective and can also be externalized, in order to make explicit the designer's thoughts for communicating with other co-workers as well as for evaluating the practice of game design students.

The insights on design approaches also lead to identify *framing* (Dorst, 2015) as a more fitting theoretical standpoint to explain design than *reflection-in-action* (Schön, 1983). This leads also to acknowledge both *problem-solving* (Simon, 1996) and *framing* as non-mutually excluding approaches for the design of games, instead of the so far mutually excluding *problem-solving* (Simon, 1996) and *reflection-in-action* (Schön, 1983) views in game studies. *Problem-solving* (Simon, 1996) and *framing* (Dorst, 2015) are both part of undertaking design and both should be part of the study of the design of games.

Game design and its contributions have been questioned for lacking insights for an understanding on how to design games (Orita Almeida, et al., 2013) (Librande, 2010), for entailing designers have to use their intuition to find out how to composite game elements and come up with a game (Järvinen, 2008). This dissertation has provided a theoretical standpoint to reach an understanding on how the design of games is done so that it is not reduced to an act of uncertainty. The dissertation introduced to game studies *C-K theory* (Hatchuel, et al., 2003), a framework for the explaining, analyzing and undertaking of design applicable to all design disciplines.

Through *C-K theory* (Hatchuel, et al., 2003), the design of games was presented as a series of transformations of concepts to knowledge and knowledge to concepts. Concepts consisting of propositions without logical status for the designers and knowledge consisting of propositions with a logical status for the designers. It was also explained and exemplified how constraints as well as the characteristics and properties of the elements the designers work with, such as notions on what a rule or what a game is, constitute information that expand the knowledge of the designers.

The process for the design of games from a *C-K theory* (Hatchuel, et al., 2003) perspective was visualized (chapter 4 and chapter 6). The text showed how designers propose concepts; how these concepts branch, partition; how knowledge is expanded from the knowledge the designers have or obtain through reasoning or researching; how obtained knowledge informs and favors the creation of new concepts; and how concepts are validated and verified for logical status by the designers. The designers check on the coherence and feasibility of the concepts.

From a *C-K theory* (Hatchuel, et al., 2003) perspective, the design of games is not presented as sequenced steps or as a structured procedure on how to clip up or edit game elements. Instead, a general understanding around design and how design is undertaken in a way that is applicable to games was provided. Thus, game design theorists and designers can forego the need of rigid guidelines for the creation of games. Instead, they can find the understanding they need for the design of games in the explanation of this activity as consisting of working with and transforming concepts and knowledge.

FUTURE LEADS FOR DESIGN STUDIES IN GAME STUDIES

This dissertation has dealt with the design activities that indie designers undertake for the creation of their games. However, design is not only what designers do, it is also the object created and the reception of what has been created (Hatchuel, 2018). For this reason, to get a broader understanding on the design of games, it is necessary to expand the research by studying specifically the games produced by the participants of this dissertation and the players of those games. With this three-dimensional research, it will be possible to understand the whole phenomenon around the creation of games, especially outside of the game industry.

This dissertation noted that game design is constructed around the game industry's practices and conventionalities. As well, the text raised awareness about the limited epistemological views on design in game studies and proposed as part of its theoretical framework and results the theoretical standpoints and resources to fill some epistemological gaps within the discipline. The dissertation also raised the awareness on the need of a body of theories within game studies addressing the design of games from an encompassing perspective, design as an inherent human activity: a theory for the design of games and play.

CONCLUSION

Several characteristics define the design of indie games: it revolves around personal projects without determining constraints structured by the designers and by their co-designers. It is formulated or framed by the indie designers and driven by an objective, but oftentimes it is not formulated and the design flows goal-free and without the knowledge of what it is about. It is permeated by spontaneity; ideas freely come and trigger the design without being necessarily forced or induced by the designers and the need to come up with a game to satisfy someone's needs. Within the design of indie games, game ideas constantly morph or evolve into new ideas and games.

The design of indie games takes place through different times and moments, through years in which the designers obtain knowledge and while ideas settle down and shape up to be turned into playable prototypes. The design of indie games is much done in prototypes and game builds, which are the canvas for the creativity of the designers.

The design of indie games is occasionally supported by applying heuristic design methods and primes more attention to reaching a satisficing design solution rather than an optimal design solution. The design of indie games is influenced and driven by the philosophies of the designers, outlooks that denote discourses about freedom, honesty following own rules and creating games on their own terms and based on their own definitions. The player's role in this kind of design is to verify that the games are understandable and accessible to other people and not only to the indie designers.

The design of indie games represents a different paradigm in comparison to game design. Even though the design of indie games implies the undertaking of all the design activities that design entails, the design of indie games is more alike to an artistic practice. Instead of being grounded on the market needs, the design of indie games represents the context for its practitioners to navigate freedom and explore their creativity and expressiveness around their own personal games.

APPENDIX A. Peculiarities of the design undertaken by the interviewed designers of indie games.

DESIGNER	SUMMARY OF THE PERSONAL DESIGN TRAITS
Daniel Benmergui	Benmergui's style is characterized by what he calls forward-focused design. This entails that he continuously explores concepts in a goal-free way, without a set objective. He may get a mental image about something and then start working on it with the engine. Then, new ideas come to him and he implements them. He also explores different alternatives. The ideas that remain are the ones that fit more the overall game. Eventually, it comes to the point at which Benmergui decides that the game is formed and he stops exploring and focuses on polishing.
AP Thomson (Hexecutable)	He starts working on a topic he gets from an external or that he gives to himself. He then aims at designing and producing the game following what he calls Adam Salzmann's *inverted pyramid*. This means getting a small playable game unit first, a functional prototype, which represents the lower part of the pyramid, the lower vertex that remains always constant. Then, the upper part of the pyramid can be extended upwards, which would equal to extending the game by adding new features. However, AP Thomson's design style is particular, in the sense that instead of just extending the game, he expands it. Thomson expands the game and changes its essence and meaning as he progresses with the development of the game and designs levels and scenes by adding new narratives, new mechanics, and features, which he calls gimmicks.
Alina Constantin (Tiny Red Camel)	Constantin's design is characterized by the research she undertakes with the aim of understanding who is her player and what is the emotion that the game has to convey. Her prototyping work can be analog, digital through visualizations, and in many cases also verbal. Constantin finds in the verbalization of her game ideas and the conversing of her designs a very useful way to verify her design work. In fact, she states her design is influenced by impro-theater.
Jim McGinley (Big Pants)	Big Pants' design style revolves around getting a functional game unit and keeping it always functional and playable despite further changes. It is while working on levels that the game as design extends and expands, though. The variations McGinley works on confer to his games new meanings.
Auriea (Tales of Tales)	The diversity of projects Tale of Tales work on leads these artists to have more than one way to design. Sometimes they have an idea for a game first; sometimes they work on the design first and later on the specific idea appears. Sometimes they work on a concept that spontaneously arises, and sometimes they can be commissioned. For Tales of Tales, it is of extreme importance as part of their design researching and documenting. Research is done thoroughly especially at the beginning of the design process and can consist of gathering audiovisual material. The documenting activities that stand out by Tale of Tales entail the

	elaboration of texts for different publics explaining their work, such as manifestos, transcripts and postmortems. These documents are also part of Tale of Tales' games because they prepare the context in which the games have to exist.
Jason Roberts	*Gorogoa's* design process started with the design and development of the basic core of the game, the main mechanic. Once having a basic and well-defined game idea, the design of the scenes took place. This entailed an intensive art, narrative and puzzles design work.
Patrick Smith	Smith regularly draws and then builds and tries out his playful ideas. These actions are totally explorative and undertaken without setting or fixing a goal. Even after working on a game build, Smith goes back to drawing as part of his creative process. It can be that he decides to settle down with an idea that has been constantly popping up and then he starts shaping it as a game or playful experience.
Terry Cavanagh	Cavanagh explores the different ideas that come to him by prototyping them. He continues working on his designs and even starts making levels and shaping up games without the need of answering his ultimate design questions: he leaves the door open for exploration; he allows his games in many situations to take their own course. He also focuses on making his games his very own way despite they may seem not so accessible to other people.
Logan Olson (Hard Light Labs)	Olson found in virtual reality a market opportunity he wanted to tackle with *Soundstage*, an idea originally inspired by previous work experiences with Pure Data. Olson defines his approach as very much influenced by the practices he learned in his previous job in Disney: he opts first to get a design and then on producing it. *Soundstage* entailed researching on virtual reality and tinkering while working with the engine and production tools. It also implied expanding the affordances and features of prototypes and game builds by getting feedback while playtesting and by trying out and implementing other virtual reality applications.
Brendon Chung (Blendo Games)	Chung envisions his design as handcraft work addressing a niche audience. He designs in an explorative way. He allows ideas and games to take their own form; to him, the design of a game is about letting the game go its own way. A very particular feature on his design is that all his games are part of the same universe.
Ditto	Ditto oftentimes participates in Game Jams and in some other occasions has ideas he would like to explore on his own. He tends to mesh mechanics and features from different games of his interest. He calls this "stealing"; he steals the mechanics and features of the games he likes. He explores through his builds how these elements work together.
Andy Schatz (Pocketwatch Games)	Shatz's designs are inspired by his interests and hobbies. He normally tries to get a design vision in paper functioning as a lighthouse for his design activities and for his team. He mentions approaching the phenomena that inspire and configure his games as ecosystems from which he identifies mechanics. He works on getting a minimal version of the game and then he and his team expand it. He also caters for player styles and provides elements that players can find compelling, such as

	characters.
Erik Svedang	Svedang's design processes vary from one situation to another. He claims to be inspired by different things for his games or to get ideas spontaneously and then work on getting a functional unit of the game; a vertical slice that can be expanded into a more complete game. Svedang defines his approach as being a "scientists" on a quest to discover if his ideas are feasible.
Ed Key	Key immerses himself in a collaborative process with other creators; he aims at finding common interests with the people he designs with. His design is explorative and revolves around analyzing possibilities and alternatives without having a fixed goal. He works more based on fixed constraints, such as the specification of having a very simple interaction for *Proteus*.
Nathalie Lawhead (Alien Mellon)	Once having a defined idea, Lawhead works on developing her games. She mentions she tries to honor her original ideas; however, through the process, bugs and unexpected things with the code may happen that may alter the result of the design. Lawhead designs as well around these bugs and imperfections. She allows them to be. She also constantly works on and designs around Easter Eggs.
Nina Freeman	Freeman conceives many ideas and lets those ideas sit down for a while. When she considers that a narrative can be supported or enacted by a mechanic, she looks for collaborators to produce the ideas. She also does extensive research on the topic, even when personal. Freeman and her collaborators throw ideas back and forth until they decide upon something to develop. The game is then developed under her supervision.
Lucas Pope	Pope claims to find himself always surrounded by many ideas for games. But he works on those ideas that after a while remain of his interest. He also opts for ideas that he considers not to be represented or explored in games already existing. He starts by building the idea and getting it functional. Then he "locks" the design and focuses on finishing of the game. However, he may also allow himself some degree of exploration during these activities, which in turns results in ending up with something different than what he had originally planned. As well, he tries to subvert players by adding elements they would not expect to find in the game.
Justin Ma (Subset Games)	Subset Games' style is characterized by a continuous exploration of ideas, where elements are implemented and later on scrapped out. Nothing is set on stone for these designers. Eventually, a minimal set of elements remains and its expansion takes place into forming a bigger game.
Douglas Wilson (Die Gute Fabrik and Copenhagen Game Collective)	For Wilson, every design is different. It all depends on who he is collaborating with. As well, it depends on the relevance he identifies on what he works on within the scene of developers to with which he subscribes.

Ezra White Hanson (XRA)	The design of *Memory of a Broken Dimension* has consisted of exploring ideas on paper and also on the build of the game. XRA's aim has been to create a game where the player has the freedom to explore the game world and find intuitively what can be done there. By designing this game, XRA has been exploring games as a medium to show that other kinds of games can also exist.
Matt Meyer and Brent Calhoun (Super Chop Games)	For *Ephemerid*, Meyer and Calhoun formulated the constraints and objectives around which they wanted to design, such as controlling the game without the need of a user interface, foregoing the use of text and affording a more visceral touch-control experience than already existing touch-control games. Throughout the design of the game, Meyer and Calhoun explored different alternatives and ways to achieve their purposes.
Tom Sennett	Sennett designs around simple ideas he wants to explore. Sometimes he aims at implementing those ideas and releasing them; while other times he does what he defines as "blowing them up". This entails the expansion of the game with new features differing from the original idea and conferring the game a new meaning.
Richard Boeser	Boeser's ideas come to him spontaneously. He works just on a few of them, though, because his games take their time to be developed and finished. His style is characterized for working with a set design objective but at the same time not locking the idea and staying always flexible for potential changes and modifications.
Eddy Boxerman	Boxerman claims to have many game ideas. Some of them tend to be inspired by ecosystems that stand out for the balancing of their elements. However, Boxerman does work on designing all his ideas. He focuses just on those ideas that other people find interesting.
James Earl Cox III (Seemingly Pointless)	Cox has been designing numerous games as part of his project on making 100 games in 5 years. He tries to come up with game ideas by thinking on the kind of experiences he would like to provide to the player and on a narrative. He explores topics and issues that would not normally be depicted or treated in games. Due to the peculiarity of his games and the reactions he has got from other people, he claims to have his own definition of what games are.
Danny Day (QCF)	Day occasionally develops games for clients. For these projects, he focuses on the objectives of the client and the characteristics of the player of the games. This implies for him researching on the audience. Day also develops his own games, and in this case, he also has a player-focus approach but still explores the ideas that are of his personal interest.
David Kananga	Kanaga frequently works collaboratively with other designers. He provides mainly the musical part of those game experiences. However, in regard *Oikospiel Book 1*, Kanaga's very own game, he did not have the intention of making a game. He did not know he could make one. He started by playing with the engine, with other third party tools and with game store assets. He was just exploring, tinkering without a goal. Suddenly, Kanaga got hooked up with the tools. He developed a narrative based on his very own philosophical vision on the topic of labor. As the

	musician he is, Kananga also accompanied the game with a libretto; which is a novelization expanding the meaning of the game.
Felix Bohtasch (Broken Rules)	Broken Rules as a group of people work on projects that appeal to them as a group, that interest them all. They also have a few criteria to decide on what to work on. For instance, they focus on designing things that are relatively simple; this because it is already too complex to develop a whole game. They prefer to work on something they can deliver well. Bohtasch also claims to base his design activities on working with constraints, on specifications to meet or objectives to achieve.
Alistair Aitchenson	Aitchenson designs games for festivals. The audience is not only the players but also the publics around the players, who are extremely important actors within the designs. These games are also performative. Moreover, Aitchenson's designing is continuous, in the sense that one game idea leads to a different game idea successively. He claims to design around the affordances and constraints of the objects that he uses for his games, which include not only hardware but also everyday life articles and other props that suddenly become game interfaces.

APPENDIX B. Computer files with the interview transcripts and analysis on MAXQDA 2018.

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