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Innovation processes in creative industries: new practices and the use of technology in the digital entertainment industry

Cristian Granados Sánchez

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Thesis title:

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A mi familia, por dejarme volar.

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Así como la historia de Bilbo Bolson, el doctorado que estoy a punto de culminar ha sido un excepcional viaje que ha cambiado no solo mis perspectivas profesionales, sino también mi vida personal y la forma en la cual concibo al mundo. Ha sido un viaje que empecé siendo una persona y termino, con la ayuda de mi familia, mentores y amigos, siendo otra. No tengo una mejor manera de explicar la profunda experiencia de vida que ha significado realizar este doctorado. Y como toda transformación y viaje, no ha sido un esfuerzo en solitario. Es así, que quiero agradecer a diferentes personas y organizaciones que hicieron posible este viaje.

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CHAPTER 1

Introduction

1.1 MOTIVATION, CONTEXT AND RESEARCH QUESTIONS

In the last few decades Creative Industries (CIs) have been gaining ground as an important topic in academic and political agendas, leading to their recognition as highly innovative industries. The concept of creative industries emerged in 1998, when they were defended by the British government as those that have their origin in creativity and individual talent to produce content, services or products with symbolic value (DCMS 1998), e.g. design, fashion, music, architecture, performing arts, video games, among other sectors. The rationale in grouping these rather diverse activities together was said to be that individual creativity and intellectual capital were the primary drivers for these sectors. A common denominator of all these activities is that aesthetic and cultural attributes are decisive elements of product and service differentiation and value (Rozentale and Lavanga, 2014). Moreover, digital technologies play an important role as they provide new forms of expressions of creativity (such as in music, movies or video games), enabling the development of new markets or new ways of distribution (Tom Fleming Creative Consultancy, 2015; Van Hoose, 2011).

According to a report supported by UNESCO (EY, 2015), these industries represented 3% of world Gross Domestic Product and 1% of the world's active population. Creative industries provide jobs that are highly skilled and more resistant to automation, jobs that are therefore more likely to be sustainable (Marcella and Rowley, 2014). In this sense, some countries have developed policies to attract and promote these sectors. For instance, European countries through the strategy "Europe 2020" (European Commission, 2016).

In this regard, understanding creative industries is therefore of strategic importance. In the academic literature, these activities have been widely studied as new industries in developed countries from the perspectives of their distinctive features, from the urban and economic domains, or from the labor occupation type under the concept "creative class" (e.g. Scott, 1996; Verganti 2006; Clare, 2012; Mellander and Florida 2011). Nevertheless, as different authors point out (Sunley et al. 2008; Marcella et al. 2014; Pick et al. 2015; Knight and Harvey, 2015), there is a gap with regards to studying their innovation processes. Since these sectors are considered highly innovative (Rozentale and Lavanga, 2014) and innovation is one of their essential aspects (NESTA, 2009), it is important to analyze their innovation patterns more profoundly.

The innovation process, traditionally understood as a sequence of individual stages of innovative activity (Salermo et al. 2015), has been analyzed by several scholars that have proposed models to explain it (e.g. Rothwell, 1994; Hobday, 2005), but these studies are focused on technological and manufacturing industries. Therefore, they do not fit the CIs, because they conceive the process as sequential activities and are associated with traditional management (Hotho and Champion, 2011).

After conducting the literature review (which is presented in the second chapter), I argue that research on creative industries has analyzed innovation from different perspectives (e.g Tschang et al. 2006; Hotho and Champion, 2011; Knight and Harvey, 2015) but in a separate way, without in-depth analysis of their innovation process, which is rarely mentioned and has been scarcely theorized (Knight and Harvey, 2015). According to Sunley et al. (2008), one of the reasons of little research on innovation

process in creative industries is due to the difficulty in identifying an output of the process, and the condition of "creative" that has generated a halo of innovative "per se". Furthermore, the role of new digital technologies in the innovation process has not been analyzed, which play a major role in these industries.

In this regard, this doctoral thesis **aims to contribute to the literature by exploring different topics of the innovation process in creative industries from the perspective of the use of new technologies (technological change) and the emergence of new practices (organizational change)**. From a general perspective, this is important because technology is one of the factors that explain why some sectors are more innovative than others, and why successive changes in industry leadership occur over time (Lee and Malerba, 2017).

The decision to analyze the innovation process from the technological and organizational change perspectives, is based on the assumption that processes and practices in organizations are related to the technology they employ (Barley, 1990), and in today´s fast-paced economy different digital and internet technologies are shaping faster several aspects of organizations (Barley, 2015). In this sense, new technologies can trigger or alter existing process, such as innovation (Scott et al. 2000), and this could create modifications in organizations, such as practices (Van Hoose, 2011). Besides, when the nature of the work changes, this could lead to the diffusion of new organizational forms and practices (Jonsson, 1998). For example, the emergence of collaborative practices in innovation, such as hackathons (Seravalli and Simeone, 2016).

1.1.1 Study context and methods

The case of the mobile games sector (i.e. games to be played on portable devices) has been used as study context (it is considered part of the digital entertainment industry). In this sense, we have collected data in three different cities (Barcelona, Montreal and Helsinki) where the presence of digital business and mobile games is important (Cohendet et al. 2010).

This creative sector has attracted considerable attention due to its capacity to combine technology, design, arts and data, to create entertainment products (Davidovici-Nora, 2014; Feijoo et al. 2012). This sector has been selected because over the last decade it has experienced a deep transformation with the introduction of some technologies, e.g digital platforms and data analytic tools (Evans et al. 2006; De Prato et al. 2014). As well, some practices have emerged. For instance, collaborative practices have been incorporated in these organizations and they have been used in innovation processes. Besides the interesting context, mobile games have become a big business generating $40.4 billion, which represents 37% of the global video game market (Newzoo, 2016).

In pursuing the main objective of this thesis and using the context of mobile games, we have used qualitative methods (literature review, single and comparative case studies and grounded theory) and data from interviews, non-participant observation and desk research. We believe this approach is suitable for our explorative questions (are described in the next section) and because qualitative data allows investigating contemporary problems in real environments providing richer data than quantitative methods (Creswell, 2013).

1.1.2 Research questions

In line with the above, this doctoral thesis aims to offer answers to the following specific questions:

RQ1: What is the state of the academic literature in regards to the innovation process in creative industries?

RQ2: What practices have been introduced in the innovation process due to technological changes?

RQ3: How have digital platforms, as new technologies, changed the innovation process and what new managerial practices have been introduced?

RQ4: How do hackathons, as new practices, contribute to innovation in creative industries?

1.2 STRUCTURE OF THE THESIS

In pursuit of the objective, it is proposed a compendium of four articles corresponding to the central chapters (Chapters 2, 3, 4, 5) of this thesis. The articles are interrelated in a way that each one contributes to the general objective and answer a specific research question. Table 1.1 summarizes the content of the four articles.

The first article (Chapter 2) is a literature review that serves as a starting point. In this paper, the existing innovation process literature in different creative sectors is reviewed, and a theoretical model for the entire innovation process is proposed. In essence, it explains how innovation occurs and what managerial practices are commonly used. Based on the proposal, an agenda for future research is presented.

The research agenda leads us to focus on the second paper (Chapter 3) on the innovation process in a specific creative sector, mobile games, and new practices that have been introduced due to technological and market changes. Based on a qualitative approach of 14 case studies, the paper proposes a data-driven innovation process model. This model explains how mobile companies explore, develop and commercialize new products/ services in an iterative way, and the role of technological and market changes on the emergence of this model.

Taking into account the research agenda from the second chapter, we now focus on the third paper (Chapter 4). This article presents an exploratory study on how digital platforms, as internet technologies, have changed and introduced new innovation practices. Using qualitative data from 50 interviews with professional, the results show that digital platforms have introduced some practices such as a creation process in real time, and they have reorganized others, such as internal structures. This research aims to contribute to the literature by improving the knowledge on how technologies change managerial practices (in this case the innovation process) and organizations, and it goes beyond by examining the changes produced on a specific creative industry.

Table 1.1 Characteristics of the main chapters

Chapter	Title	Methodology	Main findings
Chapter 2 **RQ1**	How do creative industries innovate? A literature review and a model proposal	Literature review	A research agenda and a theoretical model that explains the innovation process in creative industries
Chapter 3 **RQ2**	Innovation process in creative industries: insights from the mobile games sector	Multiple and comparative cases study. 14 companies, 38 interviews and secondary data.	The study revealed an emergent data-driven innovation process. Different technologies and market changes have led to this situation.
Chapter 4 **RQ3**	The impact of new technologies on managerial practices and organizations: The case of digital platforms on the innovation process	Grounded theory. 50 semi-structured interviews, field notes and secondary data.	Digital platforms have brought the introduction of new innovation practices. These practices have improved the innovative capacity replacing traditional intuitive methods.
Chapter 4 **RQ4**	How do collaborative practices contribute to innovation in large organizations? The case of Hackathons.	Single case study. Analytical interviews (10), and non-participant observation (72 hrs).	Hackathons contribute to innovation in exploration activities, e.g. by finding new external solutions. They also contribute by enhancing some pre-conditions for innovation, e.g. attracting talent or building a community of experts.

The last paper (Chapter 5) presents an inductive study on how hackathons, as new innovation and collaborative practices, contribute to innovation in large organizations. Drawing on a single case of a large company from a creative sector (mobile games), and based on analytical interviews and non-

participant observation, the results suggest that hackathons contribute by promoting exploration activities, and by enhancing some preconditions for innovation, such as attracting talent. This paper aims to contribute to the existing research on new innovation practices by positioning the results in innovation literature and by explaining contextual and relational factors not previously described.

Finally, the conclusions section (Chapter 6) reflects on the results obtained and it presents some future research lines to continue developing the creative industry and innovation process literature.

This thesis is based on the following published, under review and conference articles:

Published articles

Granados, C., Bernardo, M. and Pareja, M. (2017). How do creative industries innovate? A model proposal. *Creative Industries Journal,* 3 (10), 211 - 225.

Articles under review

Granados, C., Eastaway-Pareja, M. and Bernardo, M. Innovation process in creative industries: Insights from the mobile games sector. Under review in Industry and Innovation Journal (Indexed in JCR. Q2).

Granados, C., Eastaway-Pareja, M. and Bernardo, M. The impact of new technologies on managerial practices and organizations: The case of digital platforms on the innovation process. *Under review in European Management Review (Indexed in JCR. Q2).*

Granados, C. and Eastaway-Pareja, M. How do collaborative practices contribute to innovation in large organizations? The case of Hackathons. *Under review in Innovation, Organization and Management (Indexed in JCR, Q2).*

International conferences

Granados, C., Pareja-Eastaway, M. and Bernardo, M. (2017, September) *Innovation process in creative industries: Insights from the mobile games sector.* Paper presented at the 18th Continuos Innovation Conference. University of Postdam, Potsdam: Germany.

Granados, C., Pareja-Eastaway, M. and Bernardo, M. (2018, January). *How do new technologies change managerial practice? Digital platforms and Innovation processes.* Paper presented at 18th DRUID Academy Conference. University of Southern Denmark, Odense: Denmark.

Granados, C. and Pareja-Eastaway, M (2018, January). *How do collaborative movement contribute to innovation in large organizations?* Paper presented at the 2nd International RGSC Symposium. Loughborough University, London: England.

Granados, C., Pareja-Eastaway, M. and Bernardo, M. (2018, June). *Creative Industries and its innovation processes.* Paper presented at the 18th. DRUID Conference. Copenhagen Business School, Copenhagen: Denmark.

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CHAPTER 2

How do creative industries innovate? A literature review and a model proposal

2.1 INTRODUCTION

Creative industries (CIs) have positioned themselves as important in academic and political agendas due to their economical contribution and growth prospects (UNCTAD, 2013). According to a report supported by UNESCO (EY, 2015), these industries represent 3% of world Gross Domestic Product (GDP) and 1% of the world's active population. The academic research about these industries has been focused on urban and economic issues (Scott, 1996; Verganti, 2006; Clare, 2012), and on the labor occupation type under the concept "creative class" (Florida, 2002; Mellander and Florida 2011). However, there is a lack of scholarship around their management, and specifically around the innovation process (IP) (Pick et al. 2015; Townley et al. 2009).

Given that these industries have been considered as highly innovative (Rozentale and Lavanga, 2014, 55; O`Connor 2009, 387), studies about innovation in CIs have been centered in creativity research, dedicating little analysis to the innovation process (IP), which is rarely mentioned and has been scarcely theorized (Knight and Harvey, 2015). Furthermore, most of the theoretical and empirical studies about IP, have been developed in technological and manufacturing industries. Therefore they do not fit the CIs, because they conceive the process as sequential activities and are associated with traditional management (Tidd, 2001; Hotho and Champion, 2011).

Thus, the main aim of this chapter is to propose a model for the entire innovation process from the exploration to the exploitation phases, in selected CIs. Through a literature review, we analyzed the sectors of design, video games, fashion and haute cuisine. We choose these sectors because

they are examples of the use of creativity, constant innovation and symbolic value, all of which are common features for all creative sectors. In the case of the video games industry, it has become one of the most important entertainment sectors, and it combines cultural and technical components (Burger-Helmchen et al. 2012; Tschang and Szczypula, 2006). Likewise, design is fundamental in adding value and creating novelty in other kinds of industry (Sunley et al. 2008). In the fashion sector, it is usual to use aesthetic elements in order to build an individual style and competitive advantages, besides its economic importance in global context (Cillo and Verona, 2008). The haute cuisine industry has used creativity and certain cultural elements as flagships; this also has been increasingly discussed in academic literature (Svejenova, Mazza and Planellas 2007).

Our theoretical model explains the entire innovation process as a result of individual and collective efforts, and it is influenced by external and internal factors. Also it explores the following questions: Where do ideas come from? How do firms develop ideas into innovation? How do they diffuse innovation? What is the impact of the environment?

Due to the novelty of the proposal, a research agenda is proposed to reinforce this research field. The paper follows with the literature review about creative industries and innovation processes. Then, the methodology applied is presented and the model is proposed in the results section. Finally, the conclusions and the research agenda are presented.

2.2 CREATIVE INDUSTRIES, INNOVATION AND INNOVATION PROCESS

In this section the features of creative industries, linked with innovation and IP, with the intention to frame this investigation are discussed.

2.2.1 Creative industries

CIs have been known as having activities based on individual talent to produce content, services or products with cultural and symbolic value (DCMS, 1998), and positioned themselves in an important way. For instance, the European Union through the strategy "Europe 2020", mentions them as important industries for economy and employment generation. Nevertheless, the European Commission (2016) considers that there is a lack of knowledge about their function patterns and their funding.

Certain characteristics have been generalized for any creative organization (Rozentale and Lavanga, 2014). For example, authors suggest the lack of management skills (Marcella, 2014), deficiencies in commercial vision by managers (Chaston, 2008), fragmentation in small and medium-sized enterprises (Jones et al. 2004), with self-employed workers or in a part-time status, and innovation being vital for their survival (Stam et al. 2008; Caves, 2000). But also, their high expressive value, which does not reflect production costs and are the result of ideas exploitation (DCMS, 1998; Potts et al. 2008), and due to the particularity of their products as symbolic, experiential and non-utilitarian goods, where they play aesthetic and expressive roles (Caves, 2000). Consequently consumers evaluate, accept and reject them in a completely different way, versus utilitarian products or with rational purchase theory (Stam et al. 2008). All this means that they

have a different innovation process and other management practices (Knight and Harvey, 2015).

2.2.2 Innovation

Innovation is considered as constant in the CIs and is one of their essential aspects (NESTA, 2009). Traditionally, innovations have been defined as novel ideas with an application and financial returns for organizations (Baregheh et al. 2009), and this phenomenon has been researched widely in other industries and often classified in incremental innovation (Usher, 1929) and radical innovation (Schumpeter, 1934), as well as in product innovation, service innovation, process innovation and marketing (OECD, 2005).

These classifications, although widely used, do not fit with CIs because of two main reasons. First, they are more related to technological innovation and patents measurement (NESTA, 2009). Consequently, the identification of an output is more complex, and some CIs use intellectual property, *e.g.* source code in video games, while others do not use any protection, *e.g.* haute cuisine (Sunley et al. 2008). Second, innovation in CIs is based on new content or experiences, therefore it is inaccurate measuring them from utilitarian perspectives (e.g. the patent point of view). Miles and Green (2008) and Stoneman (2011), have addressed these issues and they have proposed the concept of "Hidden innovation" and "Soft innovation", which are related to: i) R&D processes but in contexts different from conventional laboratories, like in haute cuisine; ii) a mix of technology and content, but with new purposes, for example educational video games; iii) Innovation based on aesthetic change rather than utilitarian one. These approaches are taken into account in this paper in order to identify different innovation

types in CIs, through a literature review. In the methodology section it is explained in detail.

2.2.3 Innovation process

In regards to the IP, it has been defined in other industries as "a sequence of individual stages of the innovative activity" (Ota, Hazama and Samson 2013), and traditionally split into: i) internal IP, or "creation", and ii) external IP, or "innovation diffusion" (Ota et al. 2013; Rogers, 2003). March (1991) has also referred to this division in his exploration and exploitation approach, which is about ambidextrous ability of organizations to, on the one hand, create or investigate (exploration), that involves spontaneity or lack of structure, and on the other hand, implementation and repetition (exploitation), that involves standardization and control (applied in CIs by Knight and Harvey (2015).

The academic literature indicates that since the 1950s, there was a proliferation of IP models, mainly aimed at technologic and manufacturing industries (Hobday, 2005). For example, Utterback (1971) proposed one of the first linear models, Cooper (1990) developed a model divided into "stages", and Wheelwright and Clark (1992) proposed the "Funnel Development Model" along with several other authors (Rothwell, 1994; Hobday, 2005). Generally, these models proposed an IP in a simple and linear view, from ideas to market launch. Consequently, academic discussion argues that these models are not realistic and are focused on big companies with R&D departments (Salerno et al. 2015). Furthermore, these models are centered in standardized or formal processes, thus, they do not fit in with the CIs that develop a non-articulated IP (Knight and Harvey, 2015), and do not take into account factors like having several sources of

creativity. Other contributions about creativity management in organizations (Drazi, Glynn and Kazanjian, 1999; Mumford et al. 2002), have not paid attention to the IP in creative industries. Pick et al. (2015), Knight et al. (2015) and Miles et al. (2008) mention that there is a lack of theory to enable a better understanding of the innovative activity, as a set of processes in a systemic approach. This is the gap that the present paper tries to address. In other words, this study analyzes how the innovation process in creative industries is managed to propose a model that could fit for these industries.

2.3 METHODOLOGY

To address the objective of this paper a literature review was carried out to assess current knowledge. Literature reviews are considered a key tool for managing information in academic research (Turner, Swart and Maylor 2013). The methodology was applied following Tranfield et al. (2003) and the Centre for Reviews and Dissemination (2001)'s recommended stages: 1) planning the review, 2) conducting the review, and 3) reporting and dissemination. The articles were extracted from relevant journals with peer review, using the key words "innovation process" and "innovation stages", along with the sectors selected (video games, design, fashion, haute cuisine) in the title and abstract. Only empirical papers were considered, both qualitative and quantitative. The databases employed were Scopus, Emerald and Web of Science. Furthermore, for selecting the papers, the innovation types mentioned by Stoneman (2011) and Miles and Green (2008) were used. The studies focused on organizational innovation, process innovation and marketing innovation were discarded. Such selection of articles is conditioned by the attempt to focus in product and service innovation with

commercial purposes within the CIs. In total, 24 papers were found and analyzed.

2.4 RESULTS

In the next section we discuss the literature and the theoretical model for the entire innovation process is presented.

From the 24 articles analyzed in total, 4 referred to the design sector, 8 to fashion, 8 to video games and 4 to haute cuisine. The descriptive results are listed in Table 2.1. The majority of papers use qualitative methods, mainly case studies (18), longitudinal studies (1), comparative studies (2) and interviews (3). Only one article is quantitative, which is an opportunity to make this kind of research in the topic. The papers come from Europe (England, Italy, France, Denmark, Austria, Spain, Switzerland and Norwegian), North America (USA and Canada) and Asia to a limited extent (Singapore). These findings show an opportunity for contributions coming from Latin America or Asia.

Table 2.1 shows the exploration to exploitation phases, where the investigations have been carried out (March, 1991). This approach is appropriate to tackle the IP, due the lack of theories. Moreover, this approach offers flexibility to split the process into the two big phases, i.e., exploration and exploitation. The analysis of these papers highlighted that none of the papers analyzes the entire process in detail, they rather analyze it by topics. This is the main reason to propose our model.

Table 2. 1 Classification of IP studies.

Author (s)/ year	Sample/ Method	Industry	Country	Area	Phase of study	
					Explora	Exploita
Sutton and Hargadon (1996)	Case study	Design	USA	Ideas generation	X	
Redfem et al. (2003)	Case study	Fashion	UK	Supply chain	X	
Tschang (2005)	Case study/ 65 technical reports	Video game	Singapore	Idea generation. Development process	X	
Tschang et al. (2006)	2/Case study/ Interviews	Video game	Singapore	Creative process	X	
Sunley et al. (2008)	80/ Interviews	Design	UK	Idea generation, development and execution	X	X
Cillo et al. (2008)	6/ Comparativ e study	Fashion	Italy	Creative process	X	
Byrkjeflot et al. (2012)	Longitudin al study	Haute cuisine	Norway Denmark	Creation and diffusion	X	X
Messeni et al. (2014)	Case study/ Interviews	Haute cuisine	Denmark	Creation of new dishes	X	
Caniato et al. (2014)	13/Case study/ Interviews	Fashion	Italy	Creative process and development	X	X
Stierand et al. (2014)	18/ Interviews	Haute cuisine	Swiss	Creative and innovation process diffusion	X	X
Shah et al. (2003)	4/Case study	Fashion	Austria - USA	Ideas generation, diffusion	X	X
Rowley et al.(2007)	Case study	Fashion	UK	Ideas generation, development, feedback	X	X

Burger-Helmche et al. (2012)	2/Case study	Video game	Canada	Ideas generation, development, diffusion	X	X
Parmentier et al. (2014)	4/Case study	Video game	France	Ideas generation, development, test	X	
Cohendet et al.(2007)	Case study/ Ethnograph	Video game	Canada	Ideas generation. IP	X	X
Svejenova et al. (2007)	Case study	Haute cuisine	Spain	Creative process and diffusion	X	X
Andriopoulos et al. (2010)	7/Case study/ Interviews	Design	Italy	Ambidext.	X	X
Hotho et al. (2011)	Case study	Video game	UK	Innovation process and others	X	X
Panourgias et al. (2014)	3/Case study/ Interviews/	Video game	UK	Creative process and development	X	
Simon (2006)	4/Case study/ Interviews	Video game	Canada	Manager tasks in creative projects.	X	
Kincade et al. (2007)	Case study/ Survey/ Focus G.	Fashion	USA	Development production, sales	X	X
Bettiol et al. (2011)	300/ Survey/ Network analysis	Design	Italy	Networking in temporary organizations	-	-
Marcella et al. (2014)	8/ Interviews	Fashion	UK	Project management	X	X
Cohendet et al. (2014)	1/Case study/ Ethnograph	Video game	Canada France	Idea generation, development	X	X
Houman et al. (2015)	7/Case study	Fashion	Norway Denmark	Creative process	X	

2.4.1 Towards an innovation process model in creative industries

As previously mentioned, the IP has been commonly defined as a sequence of activities or stages (Ota et al. 2013). However, the literature review has shed more light on this phenomenon. The IP is an integrated process and not separated in stages, with several micro-processes and interconnections. Although the word "process" is used, in this paper it does not refer to an ordered system, because activities are more complex in organizations (Styhre, Wikmalm and Olilla 2010, 134). Since most of the existing literature focused on different parts of the IP, the proposed model theorizes it completely from the exploration to exploitation phases (Figure 2.1).

Although the IP differs in various creative sectors, the proposed model incorporates four basic aspects (based on Knight and Harvey, 2015): 1) ideas, 2) development, 3) diffusion or commercialization, and 4) external factors. Both ideas and a part of the development aspect are considered as part of exploration. The other part of the development aspect (control, standardization and administrative tasks) and diffusion, are considered as a part of exploitation. The proposed model is focused on the innovation that is the result of individual and collective efforts and is influenced by external and internal factors. Thus, the model attempts to answer the following questions:

a) Where do ideas come from? b) How do firms develop ideas into innovation? c) How do they diffuse innovation? d) What is the impact of the external factors?

Figure 2.1 Innovation process model

Regional Innovation System. City as a place for creation.
Government - Universities - Partners - Other industries - Users

Ambiguos phase

Several sources of ideas

Ideas

Coupled phases and continuous feedback

Development   Diffusion

Several ways of diffusion

Outsourcing

Linear phase
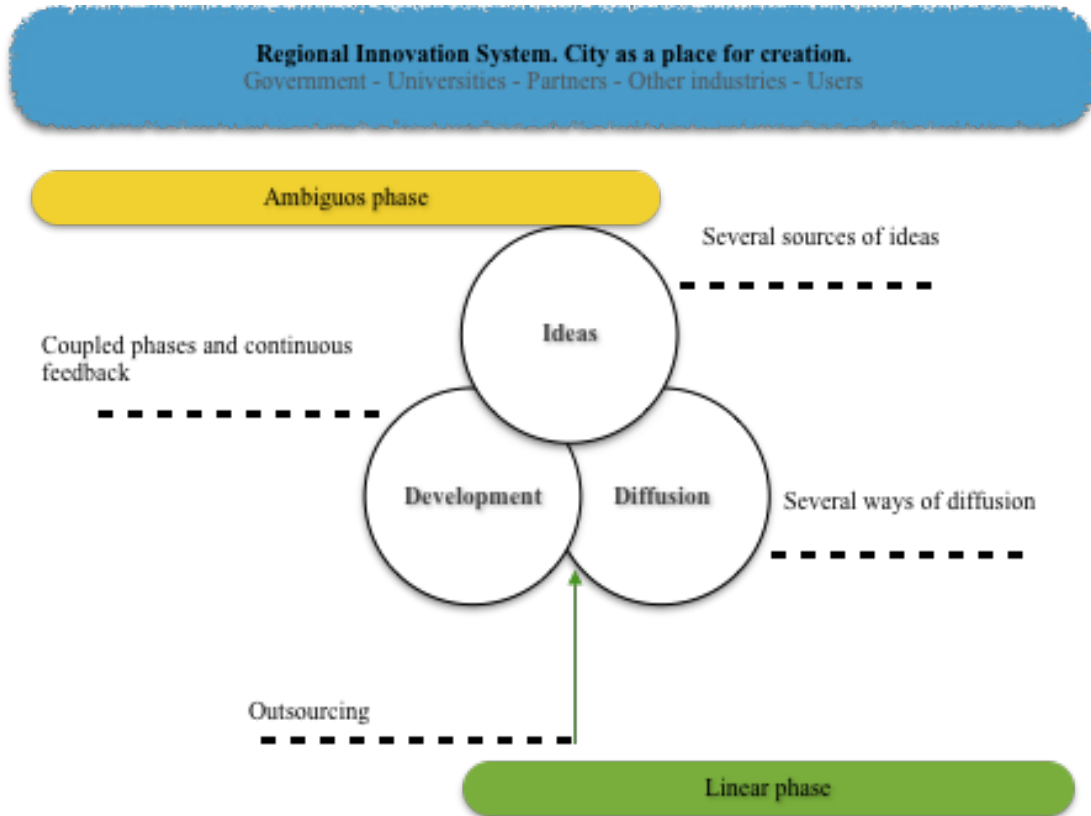
Source: own elaboration

a) Where do ideas come from?

The CIs convert an idea into a product, service and cultural or experiential content (Throsby, 2001). Four different sources of ideas have been found (see Figure 2.1):

(1) Individual creativity. This means that a person is the main creative process leader, and ideas could emerge through a recombination of elements, one's own initiative, inspiration, the influence of others,

background and the availability of internal resources like technology, or external, like cultural elements (Tschang et al. 2006; Tschang, 2005; Stierand et al. 2014; Cillo et al. 2008; Redfern and Davey, 2003; Caniato et al. 2014; Panourgias et al. 2014; Messeni and Savino, 2014). Individual creativity also is clear in the study of Caniato et al. (2014), which shows that in certain occasions the fashion sector creates new collections based on creativity of its designers. Also, Stierand at al. (2015), Byrkjeflot et al. (2012) and Svejenova et al. (2007) in their respective papers focused on haute cuisine, demonstrate that chefs play the main role in the creative process through their emotions, aspirations or inspired by local resources or certain traditions to develop new dishes. Although individual creativity is a common practice in CIs, Brentani and Reid (2012) suggest that this could trigger lack of integration with market needs, and higher uncertainty during the process.

(2) Collective work or with users. This source of ideas comes from user communities and working teams, and is common both in video game and fashion sectors. Sutton and Hargadon (1996) suggest their use in order to get ideas in brainstorming sessions or through pilot tests. In the video game sector these are used to test and get feedback from experienced and online users (Helmchen and Cohendet, 2012; Parmentier and Mangematin, 2014), which leads to an extension of company borders and reducing intellectual property. In the fashion sector users play an important role to find new materials, new ideas, pilot testing, among others (Cillo et al. 2008; Redfern and Davey, 2003; Caniato et al. 2014; Shah and Franke, 2003; Rowley et al. 2007). Also, users could be an important source to test ideas in real

environments, like the case of sport fashion sector (Shah et al. 2003; Rowley et al. 2007). All these practice are related with the open innovation concept (Chesbrough, 2003), however some creative sectors have the philosophy of "noncommercial profits" (Chaston, 2008), like open source in video games (Burger-Helmchen et al. 2012).

(3) Market. The market is a source of inspiration based on market trends and used by designers as a source to develop new proposals (Caniato et al. 2014; Cillo et al. 2008; Kincade et al. 2007). Caniato et al. (2014) shows that on some occasions the fashion sector creates new collections based on creativity of its designers (as well as Cillo et al. 2008) and in other occasions, takes in consideration the local market to adapt their new products, which is a usual strategy in technological industries and is known as "market push" (Godin, 2013). Sunley et al. (2008) in design sector, exposes an IP based on the designer-client relation, in which the main priority is to achieve persuasion in the project, this is, equilibrium among creative freedom and customer satisfaction. However, Brentani et al. (2012) considers that organizations which take the client voice too seriously could damage or reduce novelty. Redfem and Davey (2003) analyzed this dilemma in fashion industry and they proposed the "Kano" model in order to improve material selection and increase market satisfaction.

(4) Science. Cillo et al. (2008), Svejenova et al. (2007), Panourgias et al. (2014) and Cohendet et al. (2007) suggest that sectors like haute cuisine, fashion and video games, use R&D processes in order to develop new ingredients, materials or devices, which are the main

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source of creation in these sectors. The case of haute cuisine is especially interesting, where some restaurants have separated the creative process from commercialization, which leads a business model based on earning returns from innovation and R&D consultancy, instead of selling food. This money is afterwards invested in their own R&D, which enables freedom during creation and commercial success (Svejenova et al. 2007).

b) How do firms develop ideas into innovation?

Isolated ideas are not enough for innovation. There is a need for organizations and resources to convert ideas into products, services, or content to promote business benefits (Amabile, 1998). It is a systemic and complex process, rather than sequential and simplistic, and is supported by external stakeholders who promote innovation (Byrkjeflot et al. 2012; Stierand et al. 2014). For example, in haute cuisine, restaurant guides (Michelin) and the industry have the role of evaluators and promoters. In video games, publishers play an important role during the development.

Different ways in which CIs organize and use resources to convert ideas into innovation have been found, and they have been divided into two phases (see Figure 2.1): an ambiguous phase (related to exploration), and a linear phase (related to exploitation). Simon (2006) labelled these stages as the creative and ambiguously face, and the linear and administrative face, respectively. The first one is a series of non-ordered, uncertain and flexible activities. During this phase, teamwork is self-governing (Townley et al. 2009), and has freedom to find new paths, for instance, to choose tools or resources for certain tasks (Shah et al. 2003; Rowley et al. 2007). The use of similar activities from traditional industries is also applied, like

milestones, tests, multidisciplinary teams or strong leadership, but also unique activities which involve a complex and uncertain process (Tschang, 2005; Stierand et al. 2014; Simon, 2007; Cohendet and Simon, 2007), for instance, the motivating or sense making role of a creative project manager with freedom to select resources and manage work (Simon, 2006).

Furthermore, the team often manages the work in temporary units or in project-based units (Bettiol and Sedita, 2001), which are disintegrated once the project is finished. In this way it reduces complexity of the process and increases possibilities of success (Andriopoulos and Lewis, 2010; Cohendet et al. 2014); this a common tool in other CIs, like in film sector (Faulkner and Anderson 1987). In addition, firms organize work into a network with other organizations in their surroundings (Grabher, 2002), and with user communities, in order to delegate part of their IP (Helmchen and Cohendet, 2012; Parmentier and Mangematin, 2014; Svejenova et al. 2007), that constitutes a business model based on social network market, as suggested by O'Connor (2009), and is related to the open innovation concept (Chesbrough, 2003).

The second phase, the "linear phase", is more ordered and related to administrative tasks, such as access to resource and market, which often are in the hands of managers (Townley et al. 2009). During this phase deadlines, meetings or control processes occur. (Tschang, 2005; Stierand et al. 2014; Cohendet et al. 2007; Marcella and Rowley, 2014; Simon, 2006; Svejenova et al. 2007; Hotho and Champion, 2011). Nevertheless, in practice there is a lack of management skills (Marcella and Rowley, 2014) and dilemmas between artistic and commercial satisfaction, because some creators consider commercialization as a degradation of their work

(Chaston, 2008; Fillis, 2002). Wilson and Stokers (2005) suggest the division of creative process from management tasks, in order to solve this dilemma. In this respect, the CIs have two dilemmas: to manage a more creative process (ambiguous phase) and managing a more analytic process (linear phase). The scholars underline the difficulty of this dilemma, arguing that many managers or executives do not have knowledge about management tools and in practice they act intuitively (Marcella and Rowley 2014, 1). The tensions between those phases represents one of the biggest challenge in creative industries (Andriopoulos et al. 2010), which causes barriers that limits growth or creativity, as Hotho and Champion (2011) and Panourgias et al. (2014) suggest.

c) How do they diffuse innovation?

Diffusion is the way in which creative organizations promote or commercialize their products (Ota et al. 2013; Rogers, 2003). Five different practices or diffusion strategies have been found (see Figure 2.1): i) through media, ii) with the support of public actors, iii) with the support of civil society actors, iv) networking collaboration, and v) through internet.

Svejenova et al. (2007, 544) conclude that thanks to mass media, Ferran Adria's innovations have been gaining recognition and promotion. Byrkjeflot et al. (2012) also demonstrate the support from media and public actors to diffuse a common label for Nordic cuisine. Cohendet et al. (2014) in the video game sector, refer to the support from cultural, nonprofit and public organizations to promote and trigger this sector. Burger-Helmchen et al. (2012) and Parmentier and Mangematin (2014) exemplify the internet as a dissemination and commercialization means in the video game industry that has been known as "Digital Creative Business". Finally, Bettiol and

Sedita (2001) and Grabher (2002), allude to collaboration in networks to carry out logistics and sales (see also Haefliger, Jäger and Krogh 2010).

d) What is the impact of the external factors?

The model also takes into consideration the external factors and the physical space where CIs are located, which could influence innovation (see Figure 2.1). Because creative industries tend to lodge in urban centers (Scott, 1996; Clare, 2012; Stam et al. 2008), the need for face-to-face relations and for support from a local customer base (Grandadam et al. 2013), geographic space plays an important role in developing the activity successfully. The model takes as a reference Kimpeler and Georgieff (2009) and Müller et al. (2008)'s studies, who integrate the CIs as part of national or regional innovation systems, because they cooperate with other companies around them, like technologic centers, governments, universities or other industries, generating exchanges of knowledge or learning, which is essential for creation and boosting innovation in economy. Furthermore, cultural and social norms have been also taken into account, such as tolerance, which could foster or damage innovation (Florida, 2002). Moreover, the importance of physical spaces for meeting or encounters, recreation, inspiration and face-to-face communication are also highlighted (see also, Clare, 2012; Florida, 2002; Landry, 2000; Drake, 2003).

2.5 DISCUSSION AND CONCLUSIONS

The aim of this study is to propose a model, through a literature review, to represent the entire innovation process in creative industries. Despite the growing importance of CIs in the academic world and in political agendas (Stam et al. 2008), the literature review related to IP is scarce. This

literature review has demonstrated that academic contributions only analyze the process from different perspectives but in a separate way, which makes it difficult to identify the entirely innovation process in CIs. In this regard, the main contribution of this paper is the proposed model that theorizes the entire IP in CIs and is the result of the integration of the different contributions analyzed in the literature review.

Considering two main stages, exploration and exploitation (March, 1991; Stonemason, 2011; Miles and Green, 2008), the model considers three basic issues: ideas, development and diffusion. Each aspect reflects certain activities developed by creative organizations (in the video games, haute cuisine, design and fashion industries) in order to create products, services or content with symbolic, cultural or experiential value.

Regarding the idea source, and against to the usual assumption that CIs are related only with individual talent and with cultural and symbolic value (Townley et al. 2009), four different idea sources have been found: individual creativity, collective work or with users, market and science. In the video game industry all these types of sources are common, while the design sector is more focused on individual creativity and the market as main sources of new ideas. The haute cuisine sector uses chefs (individual creativity) as makers of the creative process, and fashion industry gets ideas from its designer (individual creativity), market (trends) and, to a lesser extent, from science (new materials).

In the second aspect of the model, the development process is divided into an ambiguous, complex, and flexible face (named as "ambiguous phase"), and a bureaucratic and administrative face (named as "linear phase"). Concerning "ambiguous phase", which is related to exploration activities,

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CIs organize work in temporary structures and a significant degree of outsourcing in certain processes like R&D, through market networks. Also they use traditional management tools like milestones or tests. In relation to "the linear phase", it is in hands of managers and refers to administrative tasks and standardization. However, this facet is less studied and is where CIs have lower performance (Marcella et al. 2014; Chaston, 2008). In regard to the third part of the model, diffusion, five strategies or practices have been found: through media, with the support of public actors, with the support of civil society actors, networking collaboration and through internet. In this stage, the CIs show the capacity to work in collaboration, consequently external context is important for their work.

The model also considers external factors, arguing that CIs are part of regional innovation systems, the importance of geographic space or city as place for inspiration, global-local networking, access to public actors or other industries that promote learning and obtaining knowledge.

Although the main contribution of this study is theoretical, implications for managers and academia can be extracted. For managers, the model helps in having the global picture of the IP and thus, allows the decision-making and the strategies setting. It is also contributing to reduce the uncertainty that CIs could have as they know both the stages of the IP and the factors conditioning each of them. For academia, to the best of authors' knowledge, this is the first model considering all IP stages. Thus, the model and the literature review open new research lines that are proposed in the research agenda below.

2.6 RESEARCH AGENDA

Based on the literature review and the main conclusions, the following future research lines can be suggested:

- To test the proposed model empirically. This means asking the organizations of these CIs about their innovation process. Using a survey, mainly applying quantitative methodologies that, according to the review, are the least applied in these analyses. The findings will help in improving the model and how it fits in the CIs.

- To analyze the role of open innovation (Chesbrough, 2003) in CIs. The academic literature already shows research on spillovers in CIs and their role in industrial innovation (Muller, 2008), but as innovation is a key factor for these organizations, analyzing how applying open innovation allows them to differentiate from rivals could also improve the model.

- To analyze how CIs solve the dilemmas or tensions between creative process and IP as barriers for growth, commercialization or diffusion. Most of empirical studies have focused on exploitation phase. Widening the analysis to the entire IP and propose solutions to the trade-off could also improve the innovation process. It could help to take into account ordinary or daily activities at the micro level, *e.g.*, routines or actions occurred with persons or technology, as a way of "creating from nothing" combining resources at hand to innovate (Klerk, 2015).

- To understand and measure the value-added generation of CIs. One of the biggest challenges in CIs is to achieve sales for something which consumers could get for free. It is necessary to understand the role of symbolic value to enable new products or services with high added value.

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CHAPTER 3

Innovation process in creative industries: insights from the mobile games sector.

3.1 INTRODUCTION

The topic of innovation has been one of the most discussed in management literature. Several scholars have called for addressing the roots of this process in order to understand it from different approaches and sectors (see Salermo, 2015). In the case of the creative industries as a recent academic issue, they have raised interest among scholars because they are considered as highly innovative sectors (Stam et al. 2008; Knight et al. 2015). More than 30 industries are included in this category (e.g design, software, fashion, film), but the video games sector in particular has attracted considerable attention due to its capacity to combine technology, design and arts to create complex and entertainment products (Tschang et al. 2006).

The way the mobile games sector organizes the innovation process (IP), which we understand as the different activities to create and commercialize new products (Freeman et al. 2007), has led to discussion in management and in creative industries literature. While the traditional and linear conception of the innovation process of ideas to market (Wheelwright et al. 1992; Cooper, 1990; Rothwell, 1994; Hobday, 2005), does not explain the innovation patterns in this sector, other researchers have shed more light proposing different models to explain processes based on multiple iterations and continuos testings (Baba et al. 2001; Simon, 2006; Tschang, 2005; Tschang et al. 2006; Cohendet et al. 2007; Stacey et al. 2007; Burger-Helmche et al. 2012; Parmentier et al. 2014; Belanger et al. 2016). In the innovation literature, these models are linked to iterative models based on lack of bureaucracy, trial and error, and constant adaptation (Eisenhardt, 1995; Hobday, 2000; Grabher, 2002; Loch et al. 2006; Whitley, 2006). Nevertheless, these studies have only been focused on the traditional branch

of video games (PC and console), and they have not taken into account the recent market changes, like introduction of mobile devices or the changing role of costumers (De Prato et al. 2014), which have led a deep transformation in this sector and the emergence of mobile games. Nowadays, mobile games represent the most important branch of games.

In line with this, this paper aims to analyze the innovation process in mobile games and propose a model to explain it. Why is it relevant to analyze this process in the mobiles game sector? In first place, analyzing the IP in this sector as a separate unit from traditional video games (PC and consoles) is theoretically important because the introduction of new technology and changes in the video game market introduced different practices in the innovation process. Some scholars have supported this, claiming that technological and market changes lead to transformations in business and productive systems (Barley, 2015; Juma, 2016), and consequently in innovation processes. Therefore, the central research questions of this paper are:

RQ1. What is the configuration of the mobile games innovation process?

RQ2. What practices have been introduced due to technological and market changes?

To address this issue, we conducted interviews in 14 mobile games studios located in Barcelona, Helsinki and Montreal. The main contributions are the proposition of an innovation model that attempts to explain this process, and it also presents evidence on the impact of technological and market changes in the IP. The research aims to expand the knowledge in innovation

process and creative industries, and it is significant because it addresses a gap in literature. For practitioners it presents valuable practices from leading worldwide companies. The paper is organized in the following sections: First, the article provides a background. This is followed by the methodology. Next, the findings and the innovation process model are introduced in the third section. In the last part, discussion and conclusion are presented.

3.2 BACKGROUND

3.2.1 Innovation process

The innovation process (IP), traditionally understood as a sequence of individual stages of the innovative activity (Freeman et al. 2007), has been analyzed by different scholars that have proposed models to explain it. Some of these models propose an innovation process approach based on documented rules and process, and with a linear view of ideas, evaluation, development, marketing and diffusion (Wheelwright et al. 1992; Cooper, 1990; Rothwell, 1994; Hobday, 2005; Salermo et al. 2015). In this classic view related to low uncertainty conditions, people can organize routines or standardize. Nevertheless, this could lead to inefficiency and a loss of competitive advantage due to rapid market evolution (Eisenhardt, 1995; Loch et al. 2006).

In view of this, other studies from the product development literature have proposed iterative models based on trial and error, feedback and learning as the project progress, quick adaptation and improvisation to manage uncertainty and risk in projects (Eisenhardt, 1995; Hobday, 2000; Grabher, 2002; Loch et al. 2006; Whitley, 2006). When there is uncertainty,

companies opt to be more experimental and improvisational (Scott, 1987). Therefore, this cannot be reduced to bureaucratic procedures or detailed plans (Hobday, 2000). This approach has been quantitatively tested by Eisenhardt et al. (1995) and they concluded that it is faster to innovate than others. However, some authors disagree with this one-size-fits-all approach, arguing the need for different frameworks for other sectors and situations, following contingency theory (see Salermo et al. 2015).

3.2.2 Innovation processes in creative industries.

In the case of the creative industries, some literature states that due to the particularity of their products as symbolic and experiential goods, consumers evaluate or accept them in a different way (Stam et al. 2008), which means that they have a different IP (Knight et al. 2015). The video game sector is one of the most important and profitable creative industry, generating $100 billion per year (Newzooo, 2017) and since 2004 its revenues superseded other creative activities like album sales (Cadin et al. 2006).

Video games are considered as interactive entertainment and complex products with the characteristics of both content and technology (Tschang et al. 2006), where the artistic and experiential values play a key role, which means that their new products are highly uncertainty and risky. In line with this, different scholars have argued the capacity of this sector to innovate in a more dynamic and flexible way (Tschang, 2005; Belanger et al. 2016), with non linear process in comparison with the classic view presented above (Wheelwright et al. 1992; Cooper, 1990; Rothwell, 1994; Hobday, 2005; Salermo et al. 2015). Consequently, there has been increasing interest to analyze the IP of video games. For example, Baba et al. (2001) identified

a spiral process based on a planning phase, and a development phase. Tschang (2005) described a process with frequent milestones and testing, multiple design iterations and multifunctional teams. Simon (2006) and Stacey et al. (2007) identified two general phases, one creative and spontaneous, and another linear and routinized, and other researchers have analyzed the process in a broad way (Tschang et al. 2006; Cohendet et al. 2006; Burger-Helmchen et al. 2012; Parmentier et al. 2014; Panourgias et al. 2014; Belanger et al. 2016).

Although these studies examine the IP of the gaming sector in depth, they focus on "traditional games" (console and PC games), and do not consider recent changes stemming from the introduction of new technology and market factors (Davidovici-Nora, 2014), which has introduced a new type of game and novel managerial practices.

3.2.3 Technological and market changes in the video game industry.

Technological and market changes lead important transformations in social and productive systems (Juma, 2016; Barley, 2015), and consequently on the IP; video games are a good example of it. Over the last decade this industry has experienced a deep transformation from a vertical production model dominated by retailers and hardware makers, with pay-to-play business models (De Prato et al. 2014; Davidovici-Nora, 2014), towards a more democratic system based on independent developers, digital platforms for online distribution (mainly Apple and Google), and free-to-play business models targeted to a wider market (Feijoo et al. 2012). And consequently, the emergence of new branch of games, such as mobile games.

Nowadays, the mobile gaming sector, which are casual games to be played on portable devices, represents 37% of the video game market, although by 2018 it will overtake traditional video games (Newzoo, 2016). The recently acquisitions illustrate its economic impact. For instance, Supercell, one of the biggest companies was acquired by $8.9 billion, the highest acquisition in the video game sector's history (Newzoo, 2016). The possibilities of this sector changed in 2007 with the introduction of smartphones and digital platforms, the increasing availability of mobile broadband, and the changing role of costumers as a "casual gamers" (De Prato et al. 2014). This contrasts with the traditional model, the digital platforms that distribute the games via mobile applications are Apple Store and Google Play. Apple's system is a closer ecosystem with tight control over the developments and features of the applications, and integrated with its own devices such as iPhone and iPad. Google Play is a more open system, integrated with other devices that they do not necessarily develop (Feijoo et al. 2012).

Due to all these reasons, analyzing the innovation process in mobile games is theoretically important. In our opinion, all these technological and market changes represent important constraints for the IP. For instance, thanks to the continuous user connection to the internet, companies can access a large amount of data, which has resulted in an increased importance of it to make decisions during the IP. Nevertheless, this phenomenon has been poorly studied.

3.3 METHODOLOGY

To achieve the objective, we follow the works of Yin (2014) and Eisenhardt (1989) about case studies, and Strauss et al. (1992) to construct theory from

qualitative data through abductive reasoning. Case studies allow investigating complex contemporary problems in a real environment and it provides a richer data than quantitative methods (Strauss et al. 1992). Abduction seeks a theory, explaining better something that was previously unexplained or unclear (Reichertz, 2014). Due to the explorative nature of our study, but with the previous investigation on innovation, we considered the research of Freeman et al. (2007) and Salermo et al. (2015) to operationalize the concept of innovation process. Consequently, we divide the process into three main phases: conceptualization, development and diffusion. Considering this approach, we defined constructs and propositions in order to focus the research, and as well to build a case protocol and a first draft of the interview guide.

Following recommendations of Yin (2014), we tested the protocol and improved the interview guide with two pilot case studies. A creative director, a general manager and a game designer from two companies (Mexico City and Barcelona), were interviewed. Following an abductive approach (Reichertz, 2014), these first insights allowed us to improve the interview guide and the protocol in order to collect the data later with the selected cases. The interview guide contained: i) General questions about the company and the role of the interviewee. ii) Questions related to the exploration of new knowledge and development. iii) Questions related to commercialization or diffusion of new games, and incremental innovations after the market launch. For the protocol, interview guide and invitation letter, see Annexes I.

3.3.1 Selected cases and data collection

Field work was conducted in 14 mobile game studios (see Table 3.1), located in three cities (Barcelona, Montreal and Helsinki), selected by "theoretical sampling" (Eisenhanrdt, 1989; Yin, 2014). This is, we selected cases where the phenomenon was easy to observe and that they could explain theory. We chose the cases from those cities because they are important hubs for digital business and video games (Cohendet et al. 2010).

Table 3.1 Overview of cases

Company	Number of Employees	Location of studio	Location of headquarter	Number of launched games	Most important game
King	300	Barcelona	Sweden	17	Candy Crush
Rovio	200	Helsinki	Finland	20	Angry Birds
Supercell	200	Helsinki	Finland	4	Clash of Clans
Social Point	300	Barcelona	Spain	6	Dragon City
Ubisoft (2)	3000	Montreal	France	+ than 20	Assasin's Creed
Ludia	300	Montreal	Canada	+ than 20	Jurassic World
Ubisoft (1)	50	Barcelona	France	+ than 20	Galaxy Life
Gameloft	50	Barcelona	France	+ than 20	Asphalt
Kerard Games	50	Barcelona	Spain	3	Golden Manager
Digital Legend	55	Barcelona	Spain	16	The After Pulse
Omnidrone	25	Barcelona	Spain	1	Titan Brawl
Zeptolab	20	Barcelona	Russia	8	Cut the rope
Abylight	20	Barcelona	Spain	+ than 20	-
Winko	15	Barcelona	Spain	1	Forge

Following recommendations of Yin (2014), we attempted to study a range of organizations to increase generalizability (big, medium and small-sized studios). Rovio, Supercell, Zeptolab, Ubisoft, Gameloft, King, Social Point and Ludia are some of the most successful mobile games companies with worldwide operations and revenues higher than $100 million per year. Omnidrone, Abylight, Kerad Games and Winko represent new successful competitors. To collect data, we conducted 38 semi-structured interviews with different people directly related to the innovation process (Table 3. 2 provides details). All interviews were recorded and transcribed. To avoid biases and for external validity, the case protocol was used consistently, and to triangulate information more than one person was interviewed in each company. Additionally, we review secondary data from the industry and related literature. Finally, in most of the companies was possible a period of observation after the interviews.

3.3.2 Data analysis

The data analysis was an iterative process following recommendations of Eisenhardt (1989) and Miles et al. (1994). We followed four steps to analyze the data:

- *i) Analysis within-case*. We organized each case according to different tentative categories related to the innovation process, for example, conceptualization, internal testing, pre-development and development. This step was crucial to become familiar with each case. Then, in order to avoid simple conclusions based on limited data, we created tentative concepts in each category, for instance, intuitive and historical inputs in ideation.

- *ii) Searching for cross-case patterns.* We carried out cross-case comparisons, looking for similarities and differences within each category and concept previously defined.

- *iii) Shaping hypotheses.* We accumulated evidence from our diverse data (interviews, secondary data), in order to evaluate how well or poorly the tentative categories and concepts fits.

- *iv) Enfolding literature.* Finally, we compared these emerging understanding with the extant literature, asking what is this similar to, what does it contradict, and why, in order to build a theoretical framework about the innovation process in the mobile games sector.

3.4 FINDINGS

This section presents our findings based on the data. Our primary goals are to analyze the configuration of the mobile games IP and based on this, shed more light on the impact of technological and market changes in the innovation process. The study revealed an emergent process divided in i) a "Creation phase" driven mostly by intuition, but within a framework to reduce uncertainty Here, digital platforms, internet connection and mobile devices have introduced the possibility to test the game at early stages in the process. ii) The "Live phase", when the product is in the market, is driven by data and it is an ongoing system that continuously is adding new features in the game after the launch; it seeks to extend the product life, converting the game in a service.

Table 3.2 Data sources

Company	Interviews	Secondary data	Observation
Rovio	Vice Pres. of Operations (60) Executive Producer (50)	Web of the company and other interviews in internet	Office observation during a tour provided by one of the interviewee.
Supercell	Lead Game/Producer (50) Game Lead (50)	Web of the company, press articles and other interviews found in internet.	Office observation during the field work.
King	General manager (55) Head of studio (70) Lead Designer (55)	Web of the company, press articles and other interviews found in internet	Office observation during the field work.
Social Point	Head of product (45) Product manager (50) Producer (50) Producer (50)	Web of the company, press articles and other interviews found in internet.	Office observation during a tour provided by one of the interviewees.
Ubisoft (1)	Studio manager (60) Head of production (60)	Web of the company and press articles.	Office observation during the field work.
Ubisoft (2)	Head of innovation (40) Producer (40)	Web of the company and press articles.	Office observation during a tour provided by one of the interviewees.
Ludia	Head of Production (50) Lead Producer (50)	Web of the company and press articles.	No observation
Gameloft	Lead game designer (50) Senior producer (50) Creative director (50)	Web of the company and press articles.	Office observation during the field work.
Kerard Games	Head of studio (50) Producer (50)	Web of the company and press articles	Office observation during a tour provided by one of the interviewees.
Digital Legend	Head of production (70) CEO/Founder (40)	Web of the company, press articles and other interviews found in internet.	Office observation during the field work.
Omnidrone	CEO/Founder (70) Senior game designer (50) Head of business (50)	Web of the company Press articles	No observation

Zeptolab	CEO/Founder (40) Chief of production (40) Project manager (50)	Web of the company, press articles and other interviews found in internet.	Office observation during a tour provided by one of the interviewees.
Abylight	CEO (50) Project manager (30)	Web of the company Press articles	No observation
Winko	CEO (50) Creative director (40) Game designer (40)	Web of the company	No observation

3.4.1 Creation Phase

Creative industries have a fundamental characteristic of an unstructured and spontaneous set of outcomes in which individuals are able to autonomously produce new ideas and concepts based on emotions and intuition (Stam et al. 2008; Stierand et al. 2015). We found in mobile games that the first phase of the innovation process, the "Creation phase", related to new ideas and product development, is a feedback loop that, on one hand is creating in an intuitive way, and on the other hand, testing and filter those intuitive ideas using different tools and data. During this creation phase we identified five general steps: i) ideation, ii) internal testing, iii) pre-development, iv) development and v) external testing. All of these followed an iterative process in the form of a constant feedback loop (see Figure 3.1). This process does not occur in a linear way. Quite the opposite: the people in charge know the different steps but they do not know the final outcome in advance. This is due to the nature of the creative work, intuitions and emotions play an important role in decisions about the future outcomes. This has been accurately expressed by one game designer:

"Usually at Omnidrome the game starts with one idea from the designers: I love this kind of game, I think we can do something great"

During "Ideation", the first stage of the process where companies explore promising new ideas in order to developing them later, intuitive inputs or knowledge not previous tested due to lack of data play a key role. The people interviewed noted this with expressions like:

"We test ideas that we find funny". "We do things that we would like to play".

We found four sources of intuitive inputs: individual ideas, group ideas, historical inputs and market. This has been identified by Tschang et al. (2006) as "constructivism" or the notion that new ideas are constructed from various influences. The individual ideas are common in other creative sectors, like haute cuisine, where chefs play the key role in the process (Stierand et al. 2015). The group ideas are related to ideation processes based on different employees, instead from the top positions. This is related with the concept of "Project-based firms" (Whitley, 2006), which is the capacity of the organizations to develop innovative products with multidisciplinary and free teams. The historical inputs are common in big companies. Some CEO´s and Lead products mentioned that they never start a new project "*from scratch*", but instead they get inspiration from past projects or from the company culture. One Chief of Production noted:

"Always we have autonomy to create, but this creation has to be framed within our guidelines; following company's objectives and philosophy".

Figure 3.1 Mobiles games innovation process.

Intuitive inputs

Ideation Internal test Pre-development Development External test Global Launch Data collection Ideation Development Test Launching

Data-Driven

Creation as a feedback loop

Live phase as an ongoing process

Game as a service

Source: own elaboration
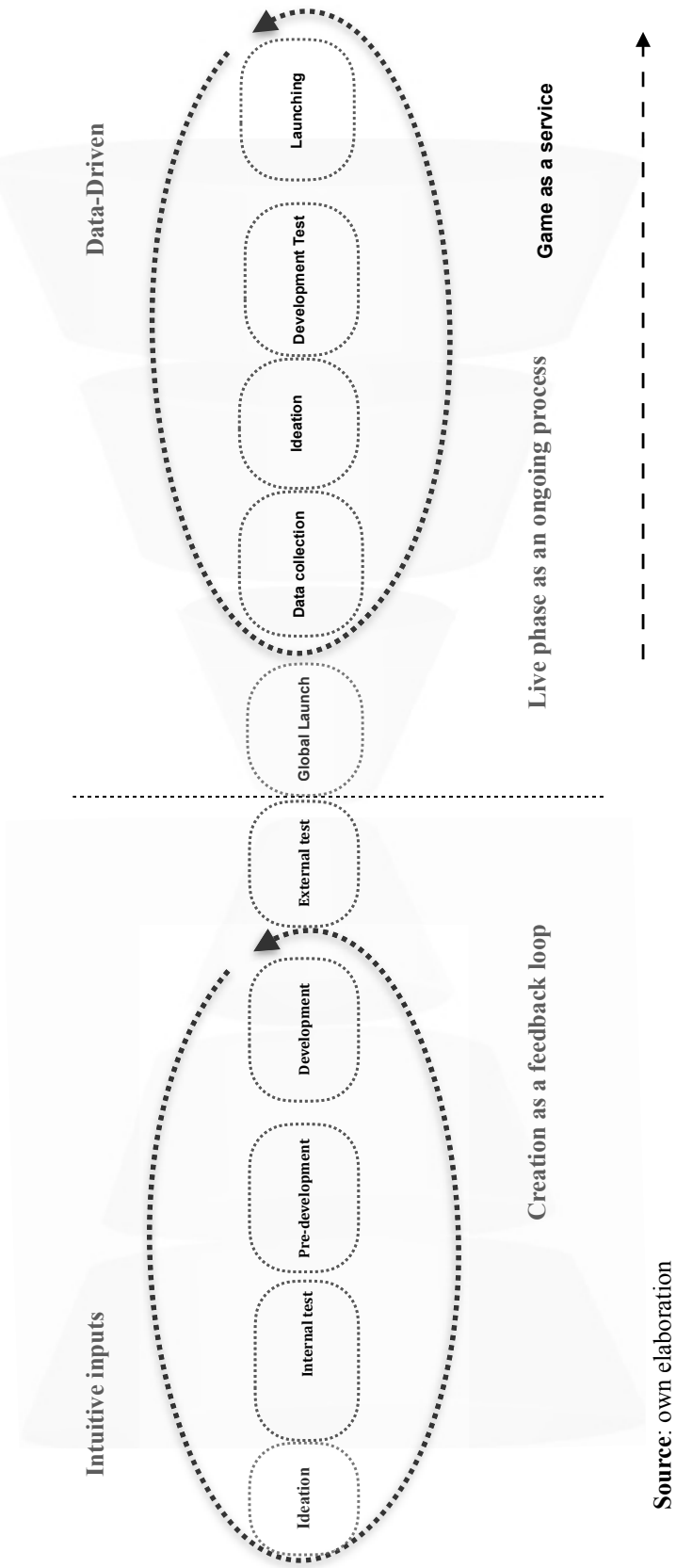
This has been noted by scholars as "path dependency", which is certain body of knowledge embed in the shared understandings within the firm that provide templates to produce innovations (Coombs and Hull, 1997). The last source, the market, is how ideation is based on market desires or needs. In line with this, some authors have suggested that creative sectors consider that their creations do not have to satisfy the market desires (Marcella, 2014; Chaston, 2008). However, in mobile games companies creation is constrained by the market using different tools and data to reduce the uncertainty of that intuitive work. As one creative director said:

"Our games have to be played by users, not by employees".

Here, the *"Internal Testing",* the second step of the process takes place. In essence, no idea goes further unless it has been internally tested. This is the way to make decisions about continuity, gain feedback to improving or killing the project at early stages. After this qualitative evaluation, the companies decide which ideas will be developed, but again, they use different tools to reduce uncertainty of ideas tested only with qualitative data. Here, the companies "Pre-develop" a set of small characteristics of the game in order to probe them and anticipate problems in development. This is a *"critical"* phase before the development and some interviewed people mentioned:

"It is a way to reduce wasting time".

At this stage, the studios have defined the central idea and the characteristics around it, in order to start the next step of "Development" of features such as art, music or programming. "Development" in mobiles games is an orderly process. This means that it is ambiguous enough to

foster new inputs (art and design), but it is well controlled through well designed systems of production, i.e. an iterative process, clear tasks and deadlines, but at the same time, freedom and trust to reach them. This is a common characteristic in "Temporary systems" or "Project-based firms" (Hobday, 2000; Grabher, 2002; Whitley, 2006), where the work is based on *"tasks"* rather than on routinized or standardized activities. Here, the deadline is the main criterion to evaluate the performance and iterations occurs continuously according to new findings or better solutions. The central idea is to iterate when necessary, re-evaluate progress and deciding what is required. It is a highly dynamic way to develop innovative products or services, like other creative sectors such as film, media or traditional games (Eisenhardt et al. 1995; Whitley, 2006).

After Development, mobile game studios do not release games directly to market, but instead test them in certain markets before the global release in order to gain more quantitative feedback and iterate once more; this is the external test. This is thanks to the introduction of smartphones and digital platforms (mainly Apple and Google). A game designer mentioned:

> *"So, basically what we do is we put the game in a market and then we see how they react to the game, and then we stabilize the game".*

This has lead a more empirical innovation process before and after the global release, and important changes during the commercialization, which we have coined as "Live phase".

3.4.2 "Live phase": an ongoing and data driven process.

The "live phase" is related to diffusion and commercialization. After the "global launch", the companies can have access a large amount of data due

to the users' constant internet connection, with the purpose of create continuously new features in order to maintain the audience. Some research has indicated that the use of data and analytics to innovate provide important competitive advantages (Ransbotham et al. 2017). As two producers noted:

"We have to create constantly and adapt the game to new competitors and circumstances".

Consequently, the "Live phase" is an ongoing creation process which is data-driven, and it is constrained by the market desires. This means that the product (game) is in the market, but still is within a loop of creation that seeks to extend the product life, adding continuously new features and converting the game in a free service. A term that explains this is "servitization" (Vandermerwe et al. 1988). This concept describes how companies are moving away from selling only products to a combination of services and products, even in creative industries, like music (Parry et al. 2012). In this sense, monetization comes from small payments for extra or special characteristics.

This ongoing system involves a) data collection, b) conceptualization, c) development-testing, and d) launching (see Figure 3.1). In essence, it is the same feedback loop as the previous creation phase, but companies can manage the process in a more empirical way, reducing the possible rejection of the new features and improving the monetization and retention of costumers. It is a way to reduce risk and uncertainty linked to innovation (Loch et al. 2006). A creative director said:

"We have data to make more objective decisions. The data tell us what the people want".

However, this approach leads important tensions to the creation process, for instance, the data allows making more accurate decisions, but employees want to add new features based on their preferences. On this, a person from Zeptolab mentioned:

"...there are so many cool things which each guy of the team would love to do. So, the biggest challenge is to balance it, and we don't want do it the wrong way".

Another tension is related to the adequacy of the new features. Adding new characteristics could lead to an increasing complexity of the product/service (game), and ultimately, confusion between users. Some companies try to focus the features maintaining the core idea and improving the performance.

3.5 DISCUSSION AND IMPLICATIONS

Based on the data, our results provide insights about the innovation process in mobile games, which also is an example on the impact of the introduction of new technologies and market changes on this process. The implications of the findings go beyond this sector and improve the knowledge of innovation in creative industries, which has implications for theory and practice.

The model presented is our first contribution. This model explains how mobile companies explore, develop and commercialize new products/ services in an iterative way, and it is compatible with adaptive models and

project-based organizations, where high uncertainty plays a key role and is important to manage (Eisenhardt et al. 1995; Hobday, 2000; Whitley, 2006; Loch et al. 2006). The entire "Creation phase" (ideation, internal test, pre-development, development) is related to previous studies in video games. For example, ideation, internal testing and pre-development are related to the "planning phase" presented by Baba et al. (2001). Or the spontaneous phase noted by Simon (2006) and Stacey et al. (2007). Nevertheless, one important difference is the capacity of the mobile games to access to a large amount of data in the "External Phase". Also, we found that the IP is based on a continuous creation process, rather than only creation and then diffusion, as most of the innovation process literature suggests (Wheelwright et al. 1992; Cooper, 1990; Rothwell, 1994; Hobday, 2005; Freeman et al. 2007; Salermo et al. 2015). In line with this, in the traditional view of the IP, the launch, preceding commercialization, is the last step of the process, however, mobile games consider the global launch as a part of the innovation process, and after this phase, the process is realized in an ongoing system with a clear dynamic: collect data, conceptualize features per market desires, and continuously launch new features in order to convert the game into a service.

This "servitization" characteristic is common in other creative sectors (Parry et al. 2012) and it is considered as a competitive advantage (Vandermerwe et al. 1988). Since for creative industries innovation is a critical aspect and is part of their daily activities, this continuos process in mobile games explains this phenomenon. Nevertheless, it remains the paradox that organizations have to deal with allocating resources to explore new ideas or to reproduce/exploit them in the market (Knight et al. 2015). A consideration linked with this is related to the paradox between the creation

and commercialization in creative industries. Some scholars have exposed the deficiencies in commercial vision in creative industries (Chaston, 2008; Marcella, 2014), and the difficulty to balance the artist's vision and the market desires. In other words, creators consider that their creations do not have to satisfied a market. Mobile games are different in this sense. We found that creation is based on intuitive inputs, which means that there is space for ideas based on artistic or symbolic values, but at the same time, companies use different tools to adjust them in the market. This approach allows desires or creators (i.e game designers, artists, programmers) and commercial purposes.

Our second empirical consideration is related to new managerial practices in the innovation process thanks to the introduction of new technology and market changes. In the mobile game sector, the primary impact has been the introduction of mobile devices and digital platforms. Some authors suggest that these digital environments are shaping the way companies interact with users and have reorganized management practices (Scott and Orlikowski, 2012; Parker et al. 2016). We observed that mobiles games have allowed the possibility to collect data from users and manage a data-driven process (mainly during the live phase) where the decisions are more "objective", because it allows testing ideas with a large number of users. Commonly, intuition is considered vital in innovation (Stierand et al. 2015; Hodgkinson et al. 2009), but also is linked to high ambiguity and likely failures (Loch et al. 2006). It appears that in mobile games this data-driven approach reduces ambiguity in making decisions, but companies have to find a balance between elements that come from the desires of employees (e.g. designers), and the suggestions from the data. In this sense, scholars argue that games are a combination of art, technology and design, but in the case of the

mobile game sector it is necessary to add data to this equation. Another important consideration is related to the close innovation model in mobile games. The "open innovation" approach (Chesborough, 2003) is the antithesis of the vertical integration where only internal resources are apply to innovate. This concept claims that companies which use external ideas or resources could gain more flexibility and competitive advantages. In the case of the mobile games, we observed that external ideas or partners are rare. This contrasts sharply with the assumption of open innovation. We suggest that this occurs because the introduction of some technologies, such as digital platforms and other digital tools, have led to easier processes. For instance, they allow publishing and distributing games without requiring intermediaries or externalization. Also, because consumers are "casual gamers" that do not care about artistic elements (Chen et al. 2016), mobile games are less complex in aesthetic terms.

3.5.1 Practical implications

Regarding to the implications for practice, our findings can help innovation practitioners in three ways. First, the innovation model proposed could provide a framework to companies to manage a more empirical innovation process where data play a key role (see Ransbotham et al. 2017), and to increase competitive advantages incorporating the idea of the product as a service during the commercialization. Second, the model may allow a process in creative industries where intuition is not neglected, but at the same is constrained by market. In other words, is a freedom process to imagine and testing until reach a good idea to develop. Third, the frequent milestones and the iterations based on time constraints (clear objectives and deadlines), is an accurate way to improve performance of the IP. In this

connection, some research has pointed the benefits of this approach (Whitley, 2006).

3.6 CONCLUSION AND LIMITATIONS

Summarizing, we have used a multiple case study approach to propose a model to explain the innovation process in the mobile game sector, which is based on a "Creation phase"— creating in an intuitive way, but also testing and filter those intuitive ideas using different tools and data—and a "Live phase", that is driven by data and is an ongoing system that continuously is adding new features in the game after the launch. But our contribution goes beyond this sector by providing evidence on how the introduction of new technology and market changes introduced new aspects in the IP. Nevertheless, our research has limitations and therefore opportunities for future studies.

First, we have focused on one creative sector, future research should go further and analyze the impact of new technology more closely, such as digital platforms or data analysis tools, in other industries. Second, a longitudinal approach could be interesting to understand the evolution and innovation process changes in this and other creative sectors. Another area for future inquiry is the impact of the "Live phase" or "servitization" approach. Are there other creative industries with the same approach? What is the impact on company performance or on the daily activities? Also, future papers must analyze the role of intuition and the emotions in the creative and innovation process, as so far this issue has been neglected (Stierand et al. 2015). And lastly, we have mentioned that the innovation process in mobile games is closed, which means that most of the companies do not cooperate with others to innovate. This contrasts with the general

assumption of the open innovation model. Future research could analyze if digitalization has caused this or what other factors are involved.

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CHAPTER 4

The impact of new technologies on managerial practices and organizations: The case of digital platforms on the innovation process.

4.1 INTRODUCTION

The evolution of the humankind has been accompanied by technological changes that have shaped the economy, society and certainly, industries and organizations (Dolata, 2009). According to Barley (1990), few scholars would dispute that structures, tasks or processes in organizations are related to the technologies they employ. In this sense, micro-level changes (e.g. new tasks or changes in processes or managerial activities) and macro-level changes (e.g. value chain, power relations, law) are influenced by critical events or contextual effects, such as the introduction of new technology (Scott et al. 2000; Lynn et al. 1996; Dolata, 2009). However, in today´s fast paced society different internet technologies are shaping faster several aspects of organizations and industries, which is not completely understood (Barley, 2015; Kelley and Zysman, 2016a). In this paper we present an exploratory study on how a specific internet technology, digital platforms, is changing a certain creative industry and thereby introducing new ways of organizing and re-organizing managerial practices.

How technologies change industries and organizations is a common question among economists and organizational scientists. This is important because changes in technology is one of the factors that explains why successive changes in industry leadership occur over time in a sector (Lee and Malerba, 2017; Christensen, 1997). At macro-level, technologies can have a transformative capacity to reorganize relations among stakeholders, adaptation in regulatory frameworks, changes in consumption and in overall, deep transformations in sectoral systems, but also the capacity to monopolize power or change the basis of competition (Noble, 1984; Barley, 1990; Lynn et al. 1996; Christensen, 1997; Dolata, 2011; Juma, 2016).

According to Perez (2010) these changes occur slowly at first, while producers, distributors and consumers engage in feedback learning processes. The studies of Dolata (2009, 2011) are useful for understanding the causes of these changes at macro-level. Dolata divides technological change into "endogenous" (developed within the sector), and "exogenous" (originated outside the sector). And to explain the effects of these technological changes, he used the concepts "low transformative capacity" (indirect effects), and "high transformative capacity" (direct and disruptive pressure).

Chesbrough and Rosenbloom (2000) suggest that there are two different ways how companies could take advantage of new technologies: though incorporating the technology in their current businesses, or through launching new ventures that exploit the technology in new markets. The focus of this paper is on the first one. In this sense, at micro-level technologies can trigger or alter tasks, skills or managerial activities and these could create modifications in organizations such as new organizational structures, business models or new production systems (Barley, 1990, 2011, 2015; Scott et al. 2000; Wellman and Haythornthwaite, 2002; Dabbish and Kraut 2006; Turban et al. 2009; Van Hoose, 2011; Dolata, 2011; Demaerschalk et al. 2012). These micro-level changes could be related, for instance, with organizational efficiency and effectiveness, such as remote work or instantaneous communication thanks to the introduction of email (Barley et al. 2011; Dabbish and Kraut, 2006; Kiesler et al. 1984).

Tushman and Anderson (1986) pointed out that certain types of innovation destroy organizational competences, while others enhance them. For

example, SEO (search engine optimization) and SEM (search engine marketing) are digital tools created by Google to promote and increase visibility of business in the internet, which have lead to the creation of new structures in organizations that before did not exist (Kelley et al. 2016a). Kiesler et al. (1984) and Barley (1990) suggest that the introduction of new technologies may change the flow of information within organizations, altering status relations, organizational hierarchy or how workers perform tasks. Similar studies have analyzed how smartphone applications may improve organizational issues (Demaerschalk et al. 2012), or how the internet has produced changes retailing or logistics, and how it has introduced new practices such as online banking or new ways of supply chain (Turban et al. 2009, 2015; Wellman and Haythornthwaite, 2002; Van Hoose, 2011).

To summarize, new technology causes changes at macro-level in industrial systems, as well as in organizations at micro-level, such as their activities, processes or tasks that people do (see Figure 4.1). Despite a vast range of literature on this issue, according to Barley (2015) there is surprisingly not enough research on how the internet is altering work. Barley (2015) suggests that "rather than ask how the internet has affected the work in organizations, scholars ask how the internet has influenced patterns of industries". Especially, digital platforms as internet technologies are opening the way for radical changes in industries and organizations (Evans et al. 2006; Gawer, 2014; Cusumano, 2015; Kelley et al. 2016a).

Different studies suggest that an important portion of economy is organized around these platforms and they already having important consequences for organizations (Armstrong, 2006; Accenture, 2016). In this sense, prior

research has analyzed how DPs have affected industries at macro-level (e.g Evans et al. 2006; Gawer 2009, 2014; Cusumano, 2015), but the literature at micro-level, or how these internet technologies have altered organizations and their managerial activities, has been scarce (Barley, 2015; Kelley et al. 2016a). According to Kelley et al. (2016a), "it is still early to understand what changes in organizations will bring platforms. For now, there are only indicators and traces to suggest an outcome". Particularly, there is not enough empirical work on how these internet technologies have affected the innovative capacity or the innovation process in organizations.

Based on this consideration, this paper analyzes how digital platforms have changed or introduced new managerial practices (at the micro-level) in companies from a particular industry. The paper uses the study context of mobile games sector, because digital platforms such as Google Play and Apple Store are re-organizing this industry (Evans et al. 2006; Feijoo et al. 2012; Davidovici-Nora, 2014). The study takes the innovation process, or the commercialization and creation of new product or services (Freeman and Engel, 2007), as the unit of study. We focus on the innovation process because new technologies have influence over innovation practices and vice-versa (Hekkert et al. 2007). Furthermore, it is a vital task for organizations which requires a combination of work, processes and technologies (Scott et al. 2000; Freeman et al. 2007). In other words, we analyze how exogenous technology (digital platforms) changed and introduced practices (at the micro-level) in the innovation process (see Figure 4.1). Our main research questions are:

RQ1. How do digital platforms have changed the innovation process in mobile games companies?

RQ2. What new managerial practices have been introduced in the innovation process?

Using a qualitative and grounded-theory approach, the research reveals that digital platforms have reorganized the sector leading to, for instance, a different value chain. This has led to important changes at the micro-level. For example, they have introduced practices that allow the execution of a continuous innovation process and collecting data in real-time. The research aims to contribute to the literature in different ways. For example, by improving the knowledge of how new technologies change practices in the creation and commercialization of new products or services (the innovation process). And how these practices have improved the innovative capacity replacing traditional methods. Also, this study contributes to the literature by examining the changes produced by an exogenous technology (digital platforms) in a certain industrial system (mobile games).

The paper is organized as follows. Section 2 reviews the existing literature on digital platforms and their effects on industries (macro-level) and organizations (micro-level). Section 3 describes the study context, the methods and presents the data. Section 4 presents the results of the analysis, and finally, the last section discusses the results. Conclusions and limitations follow.

Figure 4.1 New technology and its impacts at macro and micro level.

Digital Platforms

Mobile Games Industry

Mobile games companies

Technology from outside of the sector

Changes at macro-level. In the industry.

Changes at micro-level. Practices in organizations, such as the innovation process.
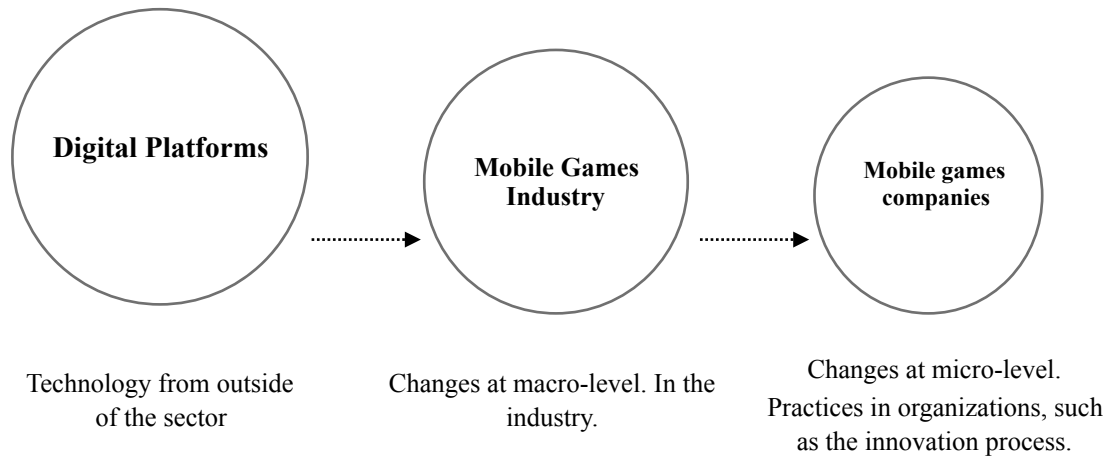
Source: own elaboration

4.2 BACKGROUND

This section presents a background about digital platforms and their effects on industrial systems (macro-level) and on organizations (micro-level).

4.2.1 Digital platforms.

Digital platforms (DPs) *"are internet technologies that act as a foundation upon which an array of firms can develop complementary products or services"* (Gawer, 2009, 1240). They also have been called "Two-sided markets", because they coordinate the demand of distinct groups of customers via "cyber places" that facilitate interaction and transactions (Evans, 2003; Armstrong, 2006; Evans et al. 2006; Gawer, 2014). There are consumer goods platforms such as Amazon or Rakuten that link buyers and sellers. There are platforms that distribute digital entertainment, as Netflix, or social media platforms, such as Facebook or Linkedln. According to the Kelley and Zysman´s (2016b) classification, platforms can be distinguished

between: i) Platform Owners, such as Google or Facebook, ii) Transaction Platforms, such as Aibnb, Amazon, Uber or Apps Stores (Google Play or Apple Store are the biggest). The goods in these platforms are created by producers and then uploaded to the platform. This is the logic how the mobile game sector works. This issue will be revisited in the "Study Context" section. And iii) User Generated Content, such as Twitter or YouTube. All depends on digitalization of human activities and on attracting users to capture value and monetize.

Kelley et al. (2016a) have coined the term "Platform Economy" to indicate that if the industrial revolution was organized around the factory, today's changes are organized around these DPs. Nowadays there are, at least, 140 "unicorns" (large tech companies) driven by platforms, with a total valuation of more than $500 billion (Accenture, 2016), and some predict that by 2018 more than 50% of big enterprises will engage in partnerships with industry platforms (Computerworld, 2015). Digital platforms are already having consequences for consumers and markets, but, what kind of consequences for organizations and industries?

4.2.2 Changes produced by digital platforms, at macro-level.

Despite the decades it can take for technological changes to transform industries (Evans et al. 2006), different studies suggest that DPs are "exogenous technologies" that are provoking reorganization of sectors ranging from video games, retail, tourism, music or film (Dolata, 2009; Gawer, 2009; Kelley et al. 2016a, 2016b).

At macro-level some studies have analyzed how platforms have affected markets, labor, law, stakeholders relations, distribution, value chain, etc. (Evans, 2003; Gasser, 2004; Gasser and Ruiz, 2005; Battelle, 2005;

Armstrong, 2006; Evans et al. 2006; Eisenmann et al. 2006; Rysman, 2009; Dolata, 20011; Gawer 2009, 2014; Standing, 2011; Khallash and Kruse, 2012; Friedman, 2014; Weil, 2014; Cusumano, 2015; Kelley et al. 2016a, 2016b). According to a report conducted by Accenture (2016), some changes include network effects and distribution power law. Especial attention requires the "Network effects" (Armstrong, 2006; Evans et al. 2006) which are related to how companies can create value by tapping into resources and capacity that they do not have to their own. It represents a shift from the traditional value chain model of optimizing the supply chain and creating barriers to entry by controlling resources. Perhaps, the best examples of these network effects are Apple Store and Google Play platforms, which have thousand of developers that have developed (in the case of App Store) 1.5 million of applications and have generated $33 billion in sales (Accenture, 2016). Both developers and platforms are using resources that they do not have for their own; the value creation is in two ways and continuous (see Figure 4.2).

Figure 4.2 Platforms Value Chain.
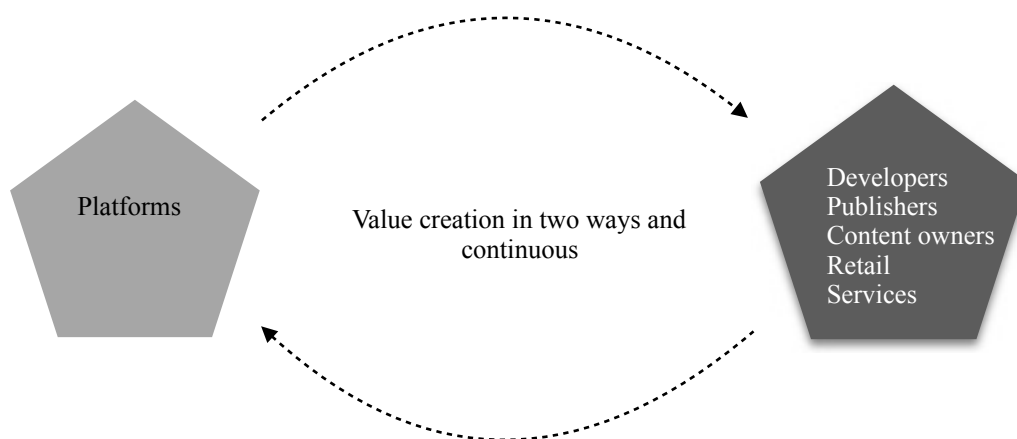
Another example is the music industry (Gasser, 2004; Gasser and Ruiz, 2005; Dolata, 2011). The breakthrough of commercialization in music occurred in 2003 thanks to the Apple's platform "iTunes", which replaced old modes of music distribution, changed relations among consumers and music producers, and adaptations in law and copyrights (Evans et al. 2006).

The computer industry is another relevant sector that has changed dramatically since the 1980´s and it can not been understood without platforms such as Google, Apple and Microsoft software platforms (Battelle, 2005), as well as the mobile phone sector with the introduction of Google´s and Apple´s digital stores. Another illustrative example is in the retail sector. The emergence of eBay as a platform that helps buyers and sellers come together, but also it provides digital tools to run their own businesses (Evans et al. 2006). Other changes have been caused by "User-generated platforms", such as YouTube and Instagram, that are reorganizing the way artists sell their work through galleries. Or sharing platforms such as Uber or Airbnb that are unlocking the commercial value of underused personal belongings (Kelley et al. 2016a).

Other scholars have pointed out the considerable changes that DPs have generated in forms of work, which are boosting new opportunities for entrepreneurship, such as the "mini-entrepreneurs (Khallash and Kruse, 2012), who provide services or goods to platforms like YouTube ("Youtubers"), Instagram (influencers) or Uber (non-licenced taxi drivers). Although its advocates claim for their positive effects, DPs have also had negative consequences. In many cases the organizing of production become "fissured" or splitting off functions that were once managed internally (Weil, 2014), in favor of outsourcing work to small companies that compete

with one another, allowing precarious work (Friedman, 2014; Standing, 2011).

4.2.3 Changes produced by digital platforms, at micro-level.

Some studies have analyzed how digital platforms are changing organizations and managerial activities (Gasser, 2004; Turban et al. 2009, 2015; Van Hoose, 2011; Teodoro et al. 2014; Gloss et al. 2016; Kelley et al. 2016a). Nevertheless, at this level of analysis there is not enough research, and some authors have claimed for more and deeper research in this direction (Gawer, 2014; Barley, 2015; Kelley et al. 2016a). The existing literature analyzed, for example, cases such as Uber and how mobile apps platforms (App Store and Google Play) have changed and produced new forms of taxi driving (Gloss et al. 2016). Uber is a distributed mobile system that enables a new form of coordination between drivers and passengers. But it also is directly involved in labour issues, such as increasing worker flexibility or new skills. Gloss et al. (2016) suggest that "with Uber, the app manages not just ride allocation–the work–but it also processes payments, tracks distance, sets fare rates and mediates the relationship between the company and its drivers". This is known as "on-demand labour" (Teodoro et al. 2014), this is, labour is managed, compensated, allocated, and produced from an app.

In the case of the music industry, besides the macro changes, as well micro changes have been documented. According to Gasser (2004) "iTunes" introduced the possibility to limit and predict what consumers can do with the songs they purchase, and the company can maximize revenue from sales. This was a price discrimination based on consumer location depends on technological measures to detect location (Gasser, 2004). One of the

largest studies on how platforms change organizations, have been conducted by Turban et al. (2009; 2015). Their work explains how digital platforms and other internet technologies have affected different contexts and economic activities. For instance, new ways to monetize, commercialize or create goods and services. Or some platforms such as Facebook or YouTube have created opportunities for artists and entrepreneurs in different areas.

Other researchers especially focus on innovation, have identified that platforms have brought the increasing capacity of collecting data, real-time solutions or faster iterations (Downes and Nunes, 2013, 2014). In the study of Werner (2017), it was found that the use of these technologies might improve decisions, analysis and actions in organizations. Because decision making are subject to numerous biases, such as imprints, prejudices or established frameworks. Finally, new organizational structures driven by digital tools, such as social media departments, have been created in existing organizations (Kelley et al. 2016a).

In sum, empirical research on the impact of digital platforms on industries (macro-level), such as the introduction of new stakeholders, new value chain logic, changes in employment and law, new ways to create and capture value, is vast. At micro-level, some papers have analyzed how these platforms have changed work, processes or organizations, nevertheless the research focused at micro-level is limited (Gawer, 2014; Barley, 2015; Kelley et al. 2016a). Particularly, there is a lack of research on how these platforms are enabling or changing innovation process. The following section details the research strategy used to examine these issues.

4.3 METHODOLOGY

4.3.1 Study context: the mobile games sector

In order to understand how digital platforms have changed and introduced new practices in the innovation process, we chose the mobile games sector (games played on portable devices, e.g. smartphones or tablets). Over the last decade this sector has experienced a deep transformation due to DPs and the introduction of smartphones (Evans et al. 2006; Feijoo, et al. 2012; Davidovici-Nora, 2014). Previously, telecom operators companies such as Vodafone or Orange had special agreements with mobile games developers to include their games in every phone (Evans et al. 2006); it was a business to business model (B2B). Nowadays, with the introduction of platforms, people are not longer restricted to the games that come with their phones. Users can download thousands from DPs such as Apple Store and Google Play, which are the main ecosystems to distribute games via mobile applications.

Apple's platform is a closed ecosystem with tight control over the development of the applications and integrated with its own devices such as iPhone and iPad. Google Play is a more open system, integrated with other devices that they do not necessarily develop (Feijoo et al. 2012). Both platforms are "Virtual Consignment Markets" that provide opportunities for producers to monetize digital goods (Kelley et al. 2016b), and they are the main gatekeepers and distributors. The business has changed from a B2B to a B2C (business to costumers) model, which also has created new revenues models. The paid content model, which is related with the "traditional model", and the "free-to-play" based on micro-transactions (Davidovici-Nora, 2014). We can say that, with the introduction of DPs this sector has

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become more inclusive, allowing the entrance of new competitors and reduction of entry barriers, such as the need for a publisher to distributing games.

Besides the interesting context, we chose the mobile games sector because it is growing faster than other creative sectors (e.g. PC or console games), and with the increasing sophistication of smartphones, they have become a big business generating $40.4 billion, which represents 37% of the global video game market (Newzoo, 2016). In this sense, for this research, we understand digital platforms as exogenous technologies with high transformative capacity because they have had direct and disruptive pressure on the structure of the mobiles games sector and as well on organizations which create and commercialize games.

4.3.2 Unit of study: the innovation process

The unit of analysis is the innovation process rather than the companies where the professionals work. Innovation has a crucial role in competitiveness and long-term growth, and it is understood as the managerial practice to create, evaluate, develop and launch to the market new products or services (Freeman et al. 2007; Salerno et al. 2015). This choice was made because new technology has an influence on innovation and vice-versa (Hekkert et al. 2007), and in the case of creation of mobile games, technology and data employed play a key role (Granados et al. 2017). The innovation process in this sector is well known for mixing artistic and entertainment values, which means that it is highly uncertain and risky. Consequently, it is necessary to manage the process in a more dynamic, flexible and data-driven approach (Belanger et al. 2016; Granados et al. 2017).

4.3.3 Method

The paper adopts a qualitative and inductive approach with field research in different organizational settings (Glaser and Strauss; 1967; Lee, 1999; Strauss and Corbin, 1992; Creswell, 2013) selected by "theoretical sampling" (Eisenhanrdt, 1989). As this study is investigating an underdeveloped area where literature is relatively inconclusive, this approach is suitable to our explorative research questions with the aim of building new knowledge rather than testing it (Creswell, 2013). We used different methods looking for theorization, and although the small sample in qualitative inquiry does not facilitate generalization, it is a legitimate strategy to develop new theory and explore items (Creswell, 2013).

4.3.4 Data collection

We collected data from three sources: semi-structured interviews, field notes and secondary data.

A. *Semi-structured interviews:* The main source of data was collected from 50 interviews with professionals (consultants, creative directors, producers, project managers, game designers, CEO´s, chiefs of innovation, chiefs of business intelligence departments, among others) working at the mobile games sector, for a minimum duration of 40 minutes and maximum 60. Professionals are from 17 different organizations: 14 large and medium mobile games studios, one public organization that promote mobile games as a creative industry, one incubator and one consulting company focused on games. We followed recommendations of Lee (1999), Lofland (1971) and Creswell (2013) about qualitative research and interview method. The interviews were carried out in person at the organization´s location in three different

cities (6 interviews in Montreal, 40 in Barcelona and 4 in Helsinki), which were selected by the local importance of this sector. Some of the biggest mobile games companies are located in Barcelona and Helsinki, and Montreal is well known as a major gaming hub (Cohendet et al. 2010). Specifically, questions explored: a) previous and current situation of the company and the mobile games sector, b) company´s innovation process approach, c) changes in the company´s innovation process caused by digital platforms, d) new managerial practices in the innovation process driven by digital platforms, e) benefits, problems and tensions caused by digital platforms, and f) changes in the sector caused by digital platforms. All the interviews were recorded and transcribed. In order to guide the interviews, a research protocol was made and was followed (see Annexes II)

B. *Field notes.* For a more comprehensive vision of this sector, we attended two professional conferences focused on the game sector. Both took place at Barcelona during 2016 and 2017. During the conferences we had informal conversations with participants and we wrote down field notes describing what we learned and what could be useful to our research questions (Lofland, 1971). We combined this information with the interviews data to build stronger understandings of how digital platforms have changed the innovation process in the mobiles games sector.

C. *Secondary data.* We reviewed secondary data sources such as digital content, websites, online interviews and reports. We looked for information relevant to our research questions.

4.3.5 Data analysis

To analyze the data, we used a grounded theory approach, in which we moved between the data and our emerging theoretical understanding in order to create theory (Glaser and Strauss; 1967; Miles and Huberman, 1984). The analysis was done through a series of phases including: a) familiarization with the data, b) creation of first-order codes, c) creation of second-order categories and finally, d) explanation of causal relationships. After familiarization with the data, we returned several times to our information looking for patterns in order to create first-order concepts related to the research questions. After this, we aggregated those first codes into more fundamental and broader categories, the second-order categories (see Table 4.1). We did this several times until reach theoretical saturation (Miles and Huberman, 1984), and finally, we triangulate our findings with the different data sources (interviews, notes, secondary data). Some quotes supporting those categories are detailed in Table 4.2, and some causal relationships between different codes - categories, and the way how they have changed the innovation process, are in Figure 4.3. Also, we looked for discrepant information and rival cases to explain better the emergent codes (Miles and Huberman; 1984). The categories captured different ways how digital platforms have changed the innovation process. All the analysis process was assisted by Atlas.ti software, version 8.1.

Figure 4.3. Causal relations. How digital platforms have changed the innovation process.

Table 4.1 Data structure (first-order codes and second-order categories)

Changes at micro-level: How do digital platforms have changed the innovation process?	
First-order codes	Second-order categories
Add new content capacity Extension of the product life Extension of the innovation process From product to half designed products Capacity to target markets in real-time Creation process in real-time	Continuous creation process in real-time
Extensive testing before launch New innovation process phases Faster iterations	Earlier access to data
Continuous extensive testing in real-time Better testing of hypothesis New ways to conduct experiments Easier identification of problems Identification of problems in advance More empirical decision	A more empirical innovation process
Extensive collecting data More available data	Data collection in real-time
Free to play games New ways of monetization Monetization based on improvement	New business models
Creation of new department New types of work New worker roles	New work structures and roles

Table 4.2 Data supporting second-order categories.

Changes at micro-level	
Categories	**Quotes supporting categories**
Continuous creation process in real-time (New practice)	"After the market launch, imagine a company like Netflix where they add new content. You don't have to download it" "We need to add content and we need to add more features on which you can consume this content in a fun way"
Earlier access to data (New practice)	"Before market launch, we do soft launch. We put the game in the platforms with real markets to see if the game has the potential and get real data. If the metrics are not good, the game has to be deleted immediately"
Data collection in real-time (New practice)	"We get tracking in terms of consumer behavior, which never had when was a box product" "Platforms allow us to know who plays, when, how and for how long"
More empirical innovation process (change)	"When you launch game in platforms, you could detect problems and fix them" "So, it minimizes the risk in the long term, so you don´t end up in the development of three years. You just see what happens; a failure could have been detected already in an earlier stage"
Contingency revenues stream (change)	"Nowadays games are for free. Therefore you have to figure out how to monetize with the digital stuff" "Consumers were used to paying for the game, and that was the maximum profit we could get from them"
New work structures and roles (change)	"We have monetization managers, who are in charge of the digital business models" "We have some new departments like business intelligence or analytics. They manage all information that we collect"

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4.4 FINDINGS

This section presents our findings drawing on our data. The goal of this inquiry is to understand how digital platforms have affected the innovation process, this is, what changes and new practices have introduced. We develop a typology of new practices that have been mainly introduced by digital platforms: a) Continuous creation process in real-time, b) Earlier access to data, c) Data collection in real-time. This means that due to platforms these practices are new or are conducted more often than before. And 3 major changes caused by DPs: d) A more empirical innovation process, e) Contingency revenues streams, f) New work structures and roles. We present our narrative description showing how digital platforms have changed and introduced new practices in the innovation process. To illustrate the categories, we use quotations from different participants and other data sources.

4.4.1 What new managerial practices have been introduced in the innovation process?

Since the introduction of digital platforms in the mobile games sector, mainly the "App Store" by Apple in 2007, and secondly the "Google Play" by Google, organizations have experienced important changes in the way they create and commercialize new games. Here we present 3 major new practices related to the innovation process: a) Continuous creation process in real-time, b) Earlier access to data, c) Data collection in real-time. Figure 4.4 shows the mobiles games innovation process, and the new practices introduced by DPs.

Figure 4.4. Innovation process in mobiles games and new practices introduced by digital platforms.

"Earlier access to data"　　　　　　**"Data collection in real time"**

Creation of the game　　Soft launch　　Market launch　　Live operations or commercialization

"Continuous creation process in real time"
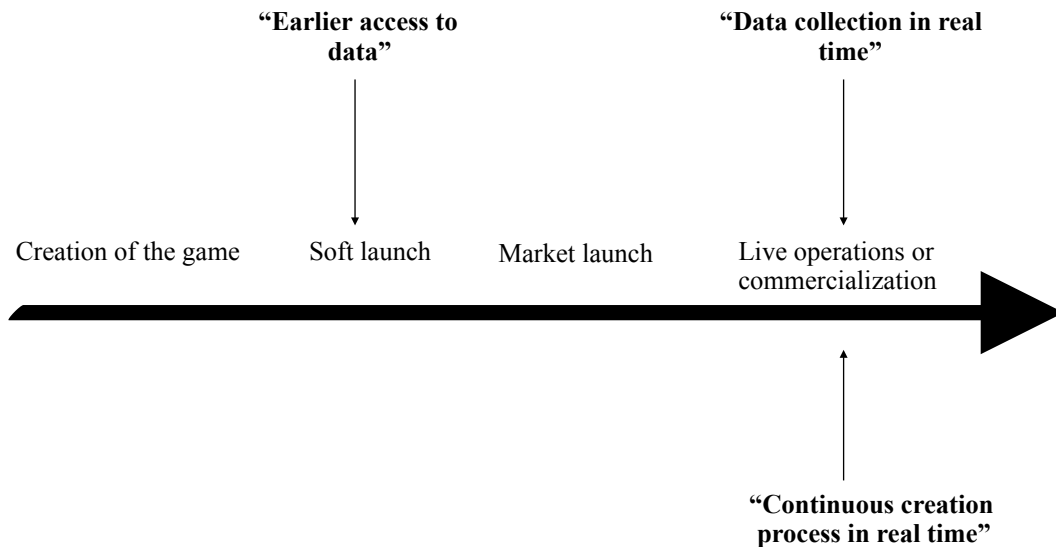
Source: Own elaboration

A) *Continuous creation process in real-time.* According to our data, one of the most important changes is the capacity of organization to run an innovation process in real-time, mainly because the product is digital and all changes or improvements can occur instantaneously. This is, companies add continuously new content in order to maintain an audience after the market launch (see Figure 4.4). A chief of production mentioned:

> *"After the market launch, imagine a company like Netflix where they add new content. You do not have to download it".*

This in an important change from a product approach to a "half-design" services. This means that companies do not sell games anymore, instead they offer the games for free, and they continuously improve the game in real-time (according to the market desires), in order to get benefits from

micro-transactions (free-to-play model). In this sense, games are more services than products. According to an industry report (National Centre for Cultural Industries, 2017) *"running games as a service requires a different organizational structure than selling products"*. For example, this has led to this situation of "continuous creation", as a lead project manager mentioned:

> *"We do not just create games and put them in the market waiting for revenues. We need to add content on which you can consume this content in a fun way"*

This model remains important and it represents a challenge for mobile games businesses. During the professional congresses we attended, it was one of the most discussed topics. It can be said that commercialization is the extension of the innovation that has become more a portfolio management. Some of the games that companies are running have been for 6 years active on the digital platforms and they are still adding content and updating the games. As a creative director pointed out:

> "*And now, you know, the mobile games are called 'game as a service'. So once the game is alive in the market, we launch new client updates"*.

In sum, thanks to the digital platforms companies can run an innovation process in real-time, adding continuously new content and adapting the product/service according to the market desires or needs, which lead an extension of the product life. A clear quotation reflects this category:

> *"The purpose in live operations is that users you acquired from the launch, you want to keep them as long as possible in the game and*

you want as well to stay engage and monetize better in the long term of the game".

B) Earlier access to data. The second change is another new activity introduced by digital platforms, which is the capacity to access data at early stages of the innovation process (see Figure 4.4). Innovation is a highly uncertain process which requires evidence to make better decision and avoid big failures in advance, wasting time and resources (Freeman and Engel, 2007). According to our interviews with professionals, companies use the technical name "soft launch" to refer to the activity to conduct an extensive testing before market launch, *"it is like a milestone when you start to get the real numbers from real people, more insights".* All professionals we interviewed mentioned this activity and according to them, it is changing the way how to make decisions and about continuity of projects. However, this is not a completely new practice. In the past, companies used to collect data before market launch with a small number of users and mainly with qualitative methods (focus group, interviews), and nowadays due to the DPs, is possible collect it on a large scale using testing markets (some testing markets like Canada or South Korea), as a producer from a Finnish company stated:

"To do the soft launch, we release the game in the platforms, and we collect the data, and then we remove it".

This capacity is changing the nature of the innovation process into a more "empirical" activity, where data play a key role to reduce uncertainty and to see if products have real commercial perspectives. A Chief of Analytic department commented:

"During the soft launch, we measure conversion. We can improve some key performance indicators (KPIs). We see how the game is performing and see what we can adjust, what to improve…".

This not only reflects the capacity to get data before the market launch, but also the ability to improve the product before being launched, as a Producer noted:

"After the first release we iterate and we release new updates and try to improve our metrics".

C) Data collection in real-time. Collection of data when the product is already on the market, it is another managerial activity that platforms have introduced (see Figure 4.4). Although DPs have brought the possibility to collect data on a larger scale, this is not completely new, the real new practice is the ability to access it in real-time. That is, when the game is "alive" in the market, thanks to the user's constant internet connection, when they play games, companies can access to data via platforms. This data is collected and analyzed by companies and it allows *"knowing who play, when, how and for how long"*. In this sense, data provides important insights to manage the product life, improving monetization and in general, increase performance when the product-service is already in the market. This real -time activity was not possible in the past because of the lack of digital platforms to collect the data, and the internet to track it. A Studio Manager explained:

"Digital platforms allow data collection. Before, an analogical platform did not".

This change has led to an unprecedented capacity to track consumers and their habits. An employee from a Business Intelligence department remarked:

"We get tracking in terms of consumer behavior, which never had when was a box product"

Nevertheless, some interviewees consider that data is not replacing intuition or decisions based on the experience gained. Some of them believe that the innovation process still relies on trial and error. For instance, a Creative Director mentioned:

"You get more data after the soft launch, but how you interpret it and what you do with it, has the same level of intuitive response as before soft launch".

4.4.2 How have digital platforms changed the innovation process?

As stated above, the literature suggests that new technologies may alter tasks, skills or processes (Barley et al. 2011, Dabbish and Kraut, 2006). Here, we present evidence on how digital platforms have changed a specific managerial activity, the innovation process. We explain 3 major changes: D) A more empirical innovation process, E) Contingency revenues stream and F) New work and structures related to the innovation process.

D) A more empirical innovation process. We consider that the capacity to access data before and after market launch, and the continuous creation process have led to a more empirical innovation process. By "empirical", we mean that the process relies more on evidence or on facts than on intuition or trial and error, as one of Lead of Production from Montreal stated:

"So, it's minimize the risk in the long term, and doesn't end up tin he development and just seeing what happens. A failure could be detected at earlier stages. So that is the creation process thinking"

All companies use "agile methods", which are innovation process approaches based on constant iterations and evidence-based decisions (Smite et al. 2010). In this sense, we observed that DPs are improving the foundations of these methods, for instance, bringing better testing hypothesis tools, new ways to conduct experiments, testing capacity in real-time, identification of problems in advance, among others. A product manager pointed out:

"We have a lot of tools nowadays, like "Play Test Cloud" or "soft launch" to check the KPI´s, and what you want verify or testing".

Although platforms are not the unique tools that have caused this, are the primary means to conduct, for instance, experiments. A CEO from a Swedish company located in Barcelona remarked*:*

"Platforms are accurate means to conduct experiments or testing hypothesis in a large scale… and see if your intuition was right or it was not. I mean, if you are trying to decide between red or black, you can conduct a testing in a certain market with App Store or Google Play, and then see which color performed better"

Another example is the way how decisions are made. In words of a consultant

"Companies know what costumers are spending money on, where they are dropping out of the game, and they know why consumers never came back. And this is super useful for adapting the product".

Some interviewees consider that this reflects a "data-driven" innovation approach, because *"companies do nothing until gathering enough evidence to justify a decision in the process".* We could say that with platforms, the process is based more on a deep understanding of the market, consumers or technology foundations. A member of a Finish company described this idea well:

"You have more precise or objective knowledge, or solid empirical arguments to create or not, to do changes or not".

E) Contingency revenues streams. Platforms are also changing and introducing new revenues stream. In the past, mobile games companies delivered or distributed games via other companies (mainly IT operators), which sold the games for a certain price to final consumers. A Business Director pointed out:

"Users used to pay for a game and that was the maximum benefit we got from them".

In other words, users paid once to get the product. But nowadays most of the companies use the "free-to-play business model" or "freemium". This means that gamers can download the game for free, and make small payments or purchases for extra characteristic or special features within the game:

"Currently the games are for free. Therefore it has to be really great in order to catch the market attention and if it is good, then will generate revenues. It is another mindset".

In this sense, and thanks to platforms and other digital tools (such as smartphones), the size of the market has grown exponentially, therefore companies can offer games for free and look for monetization only in a small portion of the big market. A CEO put this idea into words:

"We have a wider penetration because of the digital stuff. Before, the product was made to a smaller group of devices. Now there are more people attached to platforms such as App Store and Google Play downloading games"

All this has led to "contingency revenues streams", because companies are looking all the time for strategies, means or new streams to get revenues. They can modify and design these strategies depending on the context or given certain unexpected or special events, in order to see what is more likely to be purchased by consumers. For instance, companies can create special events focused on temporary activities such as important sports or cultural events. In this regard, a Creative Director mentioned:

"We create different seasons, features, characteristics, activities or even colors depending on real events, for example, the Olympic games. It is a way to generate revenues"

F) New work structures and new roles. Another change of the digital platforms at micro-level, has been the introduction of new organizational structures and new employee roles, both focused on the innovation process. As one CEO noted:

"Because of our digital work, some new roles have begun to emerge that before did not exist. Like the data analysts or the data scientists, or the "life producer" who is in charge of the continuous creation of content and updates."

In regard to the new work structures, we mainly identified three new structures: a) business intelligence departments, b) data analysts department, c) life operations teams. Business intelligence and data analysts departments are in charge of tracking, data collection and data analysis, as one Chief of Analytics mentioned:

"They analyze the data depending on our priorities or needs. They take the hypothesis and try to resolve them".

These two departments have emerged because of the large volume of data, and due to the increasing need to analyze it, in order to run a more empirical innovation process. And the the life operations teams are in charge of the "live operations", in other words, the management of the game when it is already on the market and the continuous creation of content. Two life operations managers remarked:

*"So, I´m in charge of "live operations". My responsibility is adding content to the existing games. So I have to define it and execute it". "I ´m working on **live operations**. I would say my first responsibility is taking over the project to guarantee the quality of the game and delivery it to the players."*

In regard to the new employee's roles, we identified: a) monetization managers (in charge of games monetization and find out new revenues streams), b) data scientists (data collection and analysis), and c) live

operations managers (in charge of the continuous creation process after market launch). Despite these positions seeming new, they are consequences of the reorganization of the innovation process and the creation of new structures caused by the introduction of digital platforms, among other technologies. In this regard, those positions are in essence a mix of reorganization of practices and new tasks. For example, monetization managers conduct a new task (searching for new revenues streams via platforms), but this used to be a task to the marketing department, which has been reorganized by DPs. Because of the increasing importance of data and the capacity to access it via platforms, these partially new jobs have emerged.

4.5 DISCUSSION

Using the context of the mobiles games sector, we have shed more light on how digital platforms have reorganized and introduced new managerial practices in the innovation process, and therefore they have allowed running a more empirical or data-driven process. In addition, they have enabled the capacity to extend the product life cycle by continuously adding new content in real-time, or when they are already in the market. Besides, digital platforms have reorganized and created new revenues streams or different ways to monetize games, and the creation and reorganization or work structures and employee roles. The study extends the theory of technological change and its impact on organizations and industries by bringing these factors produced by digital platforms to the surface, and examining how they have reorganized or introduced new practices in the innovation process.

This study contributes to the literature in different important ways. First, we contribute to the the effects of technological change on organizations (at micro-level). The results are consistent with other studies that have analyzed the impacts on structures, work, processes or relations work (Barley, 1990, 2015; Wellman and Haythornthwaite, 2002; Turban et al. 2009, 2015; Van Hoose, 2011; Demaerschalk et al. 2012). Specifically, our research provides insights on a specific managerial activity, the innovation process. Hekkert et al. (2007) suggests that technological changes influence innovation processes and vice-versa, in this sense, our study is relevant.

Second, our research shed more evidence on the impact of technological changes on industries or sectoral systems (at macro-level). Although the literature on this issue is vast (e.g. Castells, 1996; Noble, 1984; Lynn et al. 1996; Dolata, 2009; Perez, 2010), we conducted our study in a system that has been deeply affected by DPs, and nowadays it is a relevant digital-creative sector in terms of revenues and growth. Little research has been done on technological change within this sector (e.g. Evans et al. 2006; Feijoo et al. 2012; Davidovici-Nora, 2014). Therefore, some of our results bring new evidence on how DPs have affected the value chain, the creation of value, the business models and the stakeholders. Further research is needed to analyze deeper this and other digital and creative sectors.

Third, according to Barley (2015), there is not enough research on how the internet has altered work or processes in organizations. In this study, we illustrate how a specific internet technology (digital platforms) has altered some practices in the mobiles games sector. There is considerable empirical research on how DPs are affecting, changing or disrupting industries (e.g. Evans, 2003; Battelle, 2005; Rysman, 2009; Dolata, 20011; Gawer, 2014;

Cusumano, 2015). Nevertheless, empirical work on how these DPs have changed organizations (at micro-level), work or practices, has been scarce (Gawer, 2014; Kelley et al. 2016a). In this regard, our study provides important data. Specifically, the paper contributes to a small domain of literature on how digital platforms are improving the innovate capacity of organizations (Downes and Nunes, 2013, 2014), for example, by bringing the capacity of collecting data or real-time solutions. This expand our understandings of how the internet has disrupted in organizations and their managerial practices (Wellman and Haythornthwaite, 2002; Dolata, 2009, 2011; Turban et al. 2009, 2015; Demaerschalk et al. 2012; Barley, 2015).

This paper also contributes to the literature by emphasizing the benefits of digital tools in the innovation process. Downes and Nunes (2013, 2014) have identified different benefits, for example, "entrepreneurs can just launch their ideas and see what happens", or " innovators can experiment with new applications at little risk, abandoning prototypes that do not quickly prove popular". Also, the study of Werner (2007) identified that digital technologies provide better tools to enhance decisions and action, because decision making are subject to numerous biases. Our paper builds on this literature by bringing to the surface the typology of new practices that improve the foundations of the innovation process, such as the data collection in real time or the idea of the more empirical innovation process.

4.5.1 Limitations

There are some important limitations to take into account. First, the are some limitations related to the study setting and generalization. We analyzed a single and booming industry, and so it is not possible to generalize to other industries. Future studies may analyze different sectors

in order to obtain cross comparisons. Second, the inductive method employed in this paper, provides rich descriptive data grounded in the experience of different professionals working in several companies. Nevertheless, this is not suitable to test causality. Survey research to test the theoretical ideas developed here would be beneficial.

4.6 CONCLUSION

Technologies from outside of sectoral systems may have a transformative capacity in organizations and industries. A good example of this are the digital platforms, which are one of the most disruptive internet technologies in the modern economy. This technology has reorganized sectors, consumption, production, among other factors. However, some authors consider there is not enough research on how these technologies have affected organizations at micro-level. The present paper addresses this issue, analyzing how digital platforms have changed and introduced new practices in the innovation process.

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CHAPTER 5

How do collaborative practices contribute to innovation in large organizations? The case of Hackathons.

5.1 INTRODUCTION

In order to remain competitive, companies constantly conduct different activities to develop new products and services. Innovation keeps companies on track to achieve better business results and constant adaptation (Baregheh, Rowley and Sambrook, 2009; Daniel and Raquel, 2011). These tasks range, in general, from exploration (search for new ideas, create) to exploitation (commercialization, repetition) activities (March, 1991), and they may require different preconditions. Nevertheless, different authors have suggested that the nature of the work and the business culture are changing (National Research Council, 1999; Barley and Kunda, 2001), which have led to the emergence of collaborative practices in innovation (Jonsson, 1998; Seravalli and Simeone, 2016).

Collaboration in innovation or "opening production", refers to the way of new forms of relationships between producers and users, where the latter is taking an active role in innovation processes (Bruns, 2008; Bauwens, 2008; Seravalli and Simeone, 2016). Therefore, the way organizations innovate in different fields and how people conduct innovation activities, are becoming different (Barley and Kunda, 2001; Chowdhury, 2012). This paper aims at investigating one of these practices in large organizations from a specific creative sector, Hackathons. They have become a usual activity for some organizations, such as in software, digital, and healthcare industries (Briscoe, 2014), and in recent years they have transitioned from being informal gatherings to well-established and well-accepted events (Lodato and DiSalvo, 2016)

Hackathons are problem-focused events that bring people (insiders and outsiders) together to work collaboratively on a solution to a problem/

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challenge over a short period of time (Chowdhury, 2012); it is an example of a bottom-up form of innovation. For instance, the "Like" button of Facebook was created as part of one hackathon (Briscoe, 2014). This is a relatively new practice about how tasks of creation generate knowledge and influence institutions (Hunsinger and Schorock, 2016). In this sense, prior research has pointed out that hackathons are open innovation practices to discover solutions (Chowdhury, 2012; Karlsen and Sundnes, 2017) and as an approach to encourage innovation with their assets and resources (Briscoe, 2014).

Despite the vast literature on this issue (hackathons and innovation), how these practices contribute to innovation in corporations is insufficiently understood, and in literature it remains implicit (i.e not stated directly) or not framed in the context of innovation studies. Most of the research has been conducted in fields ranging from software, digital sectors (Mohajer et al. 2014), health care (Celi et al. 2014; Barash, Elliston and Potenzone, 2015; Silver et al. 2016; Day, Humphrey and Cockcroft, 2017), culture (Karlsen and Sundnes, 2017) or civic engagement (Jhonson, 2014; Lodato and DiSalvo, 2016). The research focused on business and framed in innovation literature is rare. Some exceptions are the papers of Rosell, Kumar and Shepherd (2014), Cooper and Edgett (2008) and Mohajer et al. (2014), although their research does not pay special attention to innovation theories or related literature.

A recent literature review (Seo-Zindy and Heeks, 2017) identified the need for more empirical research on collaborative practices, specifically the relationship between these activities and the wider innovation systems within which they sit. Another scholar also has claimed that there is a

considerable work to be done in understanding hackathons and their relation with organizations (Briscoe, 2014). In this regard, this paper develops new insights on how hackathons contribute to innovation in large corporations, closing the gap and bringing new evidence framed in terms of innovation studies. Our main research question is:

RQ1: How do hackathons contribute to innovation in large organizations?

We understand innovation as the capacity of any organization to create and commercialize novel products or services (Freeman and Engel, 2007), and a managerial activity that include several practices ranging from exploration to exploitation (March, 1991), with some different preconditions, such as external knowledge or skill employees (Hull, Coombs and Peltu, 2000; Zahra and George, 2002; Edmondson and Nembhard, 2009; Sarin and O'Connor, 2009).

To answer the research question, this paper uses the case of a large company from a creative sector (mobile games), together with data from analytical interviews with participants and organizers in two hackathons (datathon and game jam), and field notes collected through non-participant observation during these events. The results of the analysis point out that these practices contribute to innovation mainly in "exploration" activities, for instance, by finding new external solutions and ideas. But it also contributes by enhancing some "preconditions" for innovation, such as attracting talent or building a community of experts. Our research contributes to the literature of collaborative practices, hackathons and innovation in different ways: by extending the understanding of how hackathons contribute to innovation in organizations, by bringing new

factors not previously described in the literature, and by framing this evidence in innovation literature.

The paper is arranged into four sections. Firstly, we present a literature review on collaborative practices and hackathons. Secondly, the methods adopted are introduced. In the third section, the results of the data analysis are described. In the last section, the empirical evidence is presented to discuss implications for theory, research and practice. Conclusions and limitations are drawn at the end.

5.2 BACKGROUND

This section reviews collaborative practices literature and it presents a background on hackathons as collaborative practices and as a bottom-up form of innovation.

5.2.1 Collaborative practices

The most advanced economies are moving towards a more collaborative, decentralized and networked system, which promises to enable social production and exchange to play a much larger role in society (National Research Council, 1999; Castells, 1996; Benkler, 2006). In this regard, organizations are at the core of the economy and therefore they are not exempt from change. Work and organizing are interdependent, then when the nature of the work change, this could lead to the emergence and diffusion of new organizational forms and practices (Jonsson, 1998; Barley and Kunda, 2001). Some important changes in organizations, such as flatter organizational hierarchies and more autonomy in work structures, have led to requiring to workers to conduct some practices and decision-making skills previously reserved for managers, such as collaboration (Barley and

Kunda, 2001). In this sense, the ability to collaborate with both insiders (e.g workers in cross-functional teams) and outsiders (from outside of the organization) to look for novelty knowledge is more important than in the past (Zahra and George, 2002). These changes constitute a unique opportunity to analyze the emergence of collaborative practices in organizations.

These "collaborative practices", i.e. when openness and collaboration play a central role (Seravalli and Simeone, 2016), are breaking into the corporate world and are rapidly spreading in different fields ranging from medicine, culture, entertainment, government, digital industries, among others. They could be better at motivating effort and can allow people to work on projects more efficiently than would traditional mechanisms and corporations (Benkler, 2006), because individuals are free to take a more active role in innovation than was possible in the industrial economy.

Good examples are Wikipedia (an open-source encyclopedia), open-source software that is based on shared efforts, collaborative practices in government offices to develop or improve public services, crowdsource innovation solutions (such as innocentive.com) or Hackerspaces, which are community-driven spaces where people share tools and knowledge in order to learn or explore issues (Seravalli and Simeone, 2016). Some scholars consider that the emergence of these practices is supported by ethical stands and their potential to explore alternative modes of production and innovation (Bauwens, 2008; Chowdhury, 2012). This paper aims at investigating one of the most spread collaborative practices, the Hackathons. Given their structures as collaborative events and their

capacity for innovation (Lodato and DiSalvo, 2016), hackathons are an interesting and valuable set of study.

5.2.2 Hackathons as collaborative practices.

Hackathons are problem-focused events that bring people together to work collaboratively on a solution to a problem/challenge over a short period of time (Chowdhury, 2012). The term "Hackathon" appeared in 1999 in an event held in California, where developers came together to work on legal issues of software (Briscoe, 2014). Since then, they have been considered as a form of collaborative practice or "crowd contests" (Boudreau and Kakhani, 2013), which work by identifying a specific problem, offering a prize and inviting people to submit solutions (Silver et al. 2016). While earlier and the majority of hackathons were focused on software development, they have become more widespread, so the participation of non-technical expertise (e.g business developers, designers, marketers), and other fields (e.g. healthcare, government, cultural) has increased considerably.

People with mixed backgrounds participate in these events as volunteers, and this participation is encouraged through focusing on issues of significance to the participants, such as environmental, social or business issues (Briscoe, 2014). Some examples of hackathons are the MIT Hacking Medicine (hackingmedicine.mit.edu), which is a race to solve healthcare challenges using a diverse and interdisciplinary approach. Or the NASA Space Apps Hackathons, which is aimed to share ideas and engage with open data to address real-world problems (2017.spaceappschallenge.org). According to Rosell et al. (2014), some of the attributes that characterize almost all hackathons are, focused intensity (constrained in time and space),

novelty (learning something new and useful), collaborative (participants with different a background) and incentive-based (have a reward structure). The organization of hackathons generally include phases such as, a) defining a problem or challenge, b) make a call for the event c) a presentation event and education about the hackathon process, c) formation of mixed teams based on interest and skills, d) main work of the hackathon, which can last, usually, from 24 - 48 hours to several days, e) at the end of the event there are presentations in which each team presents their results or prototypes (Rosell et al. 2014; Silver et al. 2016). These results may have an important impact on the proposed challenges, and organizations may ask for funding a project. See Figure 5.1. In this sense, Hackathons have begun to be increasingly viewed by companies as an approach to develop new products, and to locate new areas for innovation.

Figure 5.1. Hackathons, basic principles of organization.

Pre-event	**During event**	**Post-event**
Problem/challenge definition	Formation of teams	Feedback
Hackathon call	**Hackathon**	Decision of funding projects
Presentation and education	Presentation of results	

Source: Own elaboration

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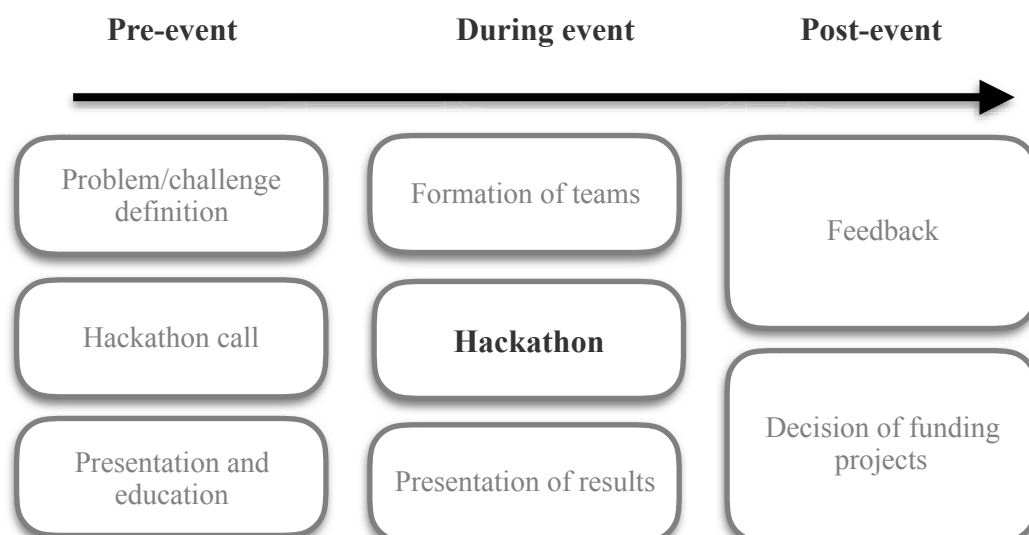
5.2.3 Hackathons and innovation.

Some scholars suggest that the rise of hackathons in organizations has been caused by the slow and bureaucracy corporate culture that has failed in innovating fast (Chowdhury, 2012). In this sense, innovation is a fundamental task for organizations in order to keep on track to achieve better business results and constant adaptation (Freeman and Engel, 2007; Baregheh et al. 2009; Daniel and Raquel, 2011). For this paper, we consider innovation as the task that includes several activities that range, in general, from exploration to exploitation practices (March, 1991; Knight and Harvey, 2015), and that requires different preconditions (i.e. necessary elements for innovation).

Exploration refers to search, discovery or invention. It as a critical innovation phase where companies develop new products or services. Some activities regarding exploration are, product development activities, new design briefs, brainstorming meetings, among others. By contrast, exploitation refers to repetition, implementation, and the efficient use of existing knowledge (March, 1991; Knight and Harvey, 2015). According to different studies (Gilbert, 2005; O'Reilly and Tushman, 2008), organizations that pursue exploitation without regard to exploration are exposed to technological disruption and high routine rigidity (Knight & Harvey, 2015). With respect to the preconditions, some examples are external knowledge and the ability to acquire it (Hull et al. 2000; Zahra and George, 2002), high skilled employees (Edmondson and Nembhard, 2009; Sarin and O'Connor, 2009) or the right work environment (Amabile et al. 1996; Mathisen and Einarsen, 2004).

In this regard, hackathons could bring broader possibilities for both exploration - exploitation activities and for preconditions. Chesrorough (2003) suggests that companies which use external ideas or resources could gain more flexibility and competitive advantages. Consequently, these practices have attracted increasing interest in both academic and practitioners agendas (Hunsinger and Schorock, 2016; Karlsen and Sundnes, 2017).

Prior research has pointed out that hackathons contribute by discovering new solutions (Chowdhury, 2012; Briscoe, 2014; Karlsen and Sundnes, 2017), driving affordable technology (DePasse et al. 2014; Mantzavinou and Ranger, 2014), or involving people to collaborate, develop innovations or build early prototypes (Silver et al. 2016). A study (Olson et al. 2017) conducted in different countries concluded that hackathons accelerate technology innovation, business plan development or new company formation. In another paper focused in the development of a new communication platform at AT&T (Rosell et al. 2014), researchers found that there is a cyclic relationship between innovation and hackathons, as shown in Figure 5.2. According to Rosell et al. (2014) hackathons lead to innovating ideas which in turn prove to be a catalyst in improving products; if organized well, hackathons are a potent source of innovation within companies. In the study of Cooper and Edgett (2008) and Mohajer et al. (2014), hackathons are identified as "ideation contests" which allows novel insights, and its success to deliver value for innovation lies in different factors, such as the problem area or the rewards. Nevertheless, Cooper and Edgett (2008) pointed out that it is not a popular method in large companies (for ideation) and its effectiveness is low. Nonetheless, they get good reviews from users.

Figure 5.2. The cyclic relationship between hackathons and innovation.

Hackathons have not been without criticism on their benefits for innovation. There are some doubts about the utility of hackathons, and critiques have emerged over how, for example, ideas are rarely effective or adopted in addressing the problems that hackathons inspire, or the challenges/problems are too complex to be addressed in a short period of time (Olson et al. 2017). In a study conducted in the film industry (Karlsen and Sundnes, 2017), researchers found that participants experienced frustrations resulting from their expectations about the results of the hackathon. Lodato and DiSalvo (2016) suggest that this stems from a misunderstanding of the process and outcomes of hackathons, and Briscoe (2014) points out that hackathons can potentially suffer from a lack of institutional memory. This is because it requires the ongoing transmission of these memories between members of the group.

In sum, Hackathons have become an increasingly popular innovation approach for different organizations across different fields. Nevertheless, how these practices contribute to innovation in corporations is insufficiently understood and in literature, it remains implicit (i.e not stated directly) or not framed in the context of innovation studies. Seo-Zindy and Heeks (2017) and Briscoe (2014) suggest that is necessarily gaining a deeper understanding of this phenomenon in organizations. In line with this, this paper aims to shed more light on how Hackathons contribute to innovation in large corporations and framing the resultant evidence in innovation literature. To do that, we take into account the exploration and exploitation theory (March, 1991; Knight and Harvey, 2015) previously explained.

5.3 METHODS

This study has been conducted using a qualitative driven approach in order to understand how hackathons contribute to innovation. Our primary methods are analytical interviews with insiders (employees) and outsiders (hackathons participants), and non-participant observation during two hackathons (a datathon and a game jam). This section presents in detail the methodology used.

5.3.1 Research Setting

We conducted our research in a large company located in Barcelona, Spain (350 employees), which has been chosen for being an open and innovative organization. For confidentiality reasons, we refer to as Mobiletech. Mobiletech is a world reference in mobile games with an active fan base of more than 50 million players. It was founded in 2008 and has gone on to become one of the world's leading developers of online social games with

more than \$120 million in revenues per year. Much of the company´s success has been attributed to its openness, agility to innovate and the capacity to attract international talent.

This organization has launched a number of hackathons. In particular, we will look into two of them. First, a "Datathon" (40 outsiders participant - 10 teams - 1500 euros prize - 24 hours) celebrated in September 2016, which aimed at using data to create models to predict users behavior. This kind of hackathon is known as an open-source model to support cross-disciplinary collaboration in an effort to foster innovation (Aboab et al. 2016). The reason is that innovation in mobile games is based on a combination of technology and art, but data plays a key role. Companies use available data to evaluate and test what characteristic are more likely to be consumed; it is a data-driven innovation. This hackathon was conducted only with outsiders. The second hackathon was a "game jam" celebrated in May 2017. An internal event to develop over 48 hours prototypes for new games. This one was conducted only with employees. Hackathons for video games development are sometimes called game jams, where participants collaborate in the area of user experience challenges, which is a necessary and important part of computer game development (Karlsen and Sundnes. 2017).

5.3.2 Data collection and analysis

We collected data from different sources. On the one hand, analytical interviews with people related to the organization of Hackathons, and on the other hand, non-participant observation during the Hackathons. For the interview guide and the non-participant observation protocol, see Annex III. We approached this study with an open and exploratory perspective with no

hypothesis or theoretical framework beforehand; also known as "grounded theory" (Glaser and Strauss, 1967; Creswell, 2013).

a) Our primary method when studying how hackathons contribute to innovation was analytical interviews with outsiders (three hackathon participants), and insiders who participated or organized the events (i.e. Chief of Analytics Office, organizer of the datathon, product manager, producer, Chief of Technology Office, the organizer of the game jam and a data analyst). All insiders are involved in innovation issues in Mobiletech. We chose analytical interviews because this method emphasizes collaborative analysis and construction of knowledge between an interviewer and a respondent, which fits with the grounded theory approach (Kreiner and Mouritsen, 2005). The topics of the interviews were related to the hackathons and the innovation approach of the company: i) company background ii) hackathon as collaborative-innovation practice ii) organization of hackathons iii) the purpose in organizing hackathons iv) link between innovation and hackathons vii) contributions of hackathons to innovation. The identification of the interview topics was derived from first informal interviews with employees who participated and organized previous hackathons. Following recommendations of analytical interviewing, we did several follow-up questions during the interviews in order to explore new domains or topics. All interviews were recorded and transcribed.

b) Our second method was a non-participant observation in two hackathons (the game jam and the datathon) organized by Mobiletech. These two events have been explained before. Both took place at the Mobiletech headquarter in 2016 and 2017. We follow recommendations of Robson

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(2002) about observation methods. Our roles were passive observers. However, we occasionally asked questions and joined in conversations. Our observations were documented through notes and photos.

The data was analyzed to find how hackathons contribute to innovation. In other words, how hackathons contribute to exploration activities and how they enhance preconditions for innovation, which are considered in Table 5.1. The data analysis was qualitative, in which we coded the information according to different topics related to our research question, and we moved between the data and the existing literature until reach theoretical saturation (Strauss and Corbin, 1992; Creswell, 2013).

5.4 RESULTS

A surprising variety of items emerged from the analysis, including several that we had not considered. Our findings suggest that hackathons contribute to innovation in exploration activities and by enhancing some preconditions for innovation. We have selected the six more relevant contributions (see Table 5.1). Table 5.2 presents evidence that grounds these results. In the next section, these findings are explained.

Table 5.1 Codes: How hackathons contribute to innovation

	Codes	Representative quotes
	New external solutions/ideas	*They have contributed to some changes that we have made in our existing games*
Exploration	**Finding unexpected problems/ solutions**	*The teams showed us problems that we did not see*
	Conceptualizatio n of new products	*That worked really well to creating new games and getting new ideas*
	Building a community of experts.	*There are groups here, and they are trying to promote Barcelona as a center of excellence in analytics. And we want to contribute to that*
Preconditions	**Increasing motivation or sense of achievement**	*It is really nice to come up with fresh ideas and also showing people what is possible to achieve in just two days*
	Attracting talent	*It´s difficult to get the talent that we want; Hackathons are quite helpful*

<div align="center">**Table 5.2** Evidence supporting results.</div>

Exploration items	Analytical Interviews	Non-participant observation
	Strong evidence	Strong evidence
New external solutions/ideas	Most interviewees (e.g. organizers and participants) mentioned this item.	During dathathons, participants presented solutions for a challenge
	Strong evidence	Moderate evidence
Finding unexpected problems/ solutions	Most interviewees mentioned this item giving clear examples.	Some people mentioned this item in informal conversations during the datathon.
	Moderate evidence	Strong evidence
Conceptualization of new products	Although respondents mentioned this issue, is not clear in what extended the ideas from hackathons are useful in the organization.	During the game jam, teams presented real prototypes.
Precondition items	**Analytical Interviews**	**Non-participant observation**
	Strong evidence	Strong evidence
Attracting talent	Most respondents stressed how helpful hackathons are to attract and find skilled and passionate workers.	Open positions were mentioned and participants were invited to submitted applications.
	Strong evidence	Low evidence
Building a community of experts	Key informants from the company mentioned this item. Outsiders also consider this as an important issue.	We did not observe something related to this item. However, one respondent mentioned it.
	Moderate evidence	Low evidence
Increasing motivation or the sense of achievement	Some respondents mentioned this item, mainly participants and organizers.	Although during observation participants were motivated, we did get any extra evidence.

5.4.1 How hackathons contribute to innovation in exploration activities

As stated above, innovation is a task that includes several activities that range, in general, from exploration to exploitation practices (March, 1991; Knight and Harvey, 2015). In this sense, we have found that hackathons contribute in exploration activities (i.e. research, discovery or invention), by i) finding new external solutions or ideas, ii) finding unexpected problems or solutions, and ii) conceptualization of new products in a collaborative environment. In the following paragraphs, we describe these items.

i) New external solutions or ideas.

The first way how hackathons contribute in explorations is by bringing external solutions or ideas. This seems obvious when we refer on hackathons, however, we have observed that these events (in this case the datathon) are a way to both create new ideas with outsiders and contrast them with company´s workers, as a hackathon participant mentioned:

> *"The company proposed a problem… they want to see how different people come up with ideas, and see how different those ideas are from the internal ones".*

This situation is encouraged by the fact that participants come from different backgrounds, and they work over the challenges with insiders by bringing cross-pollinating ideas. This is, by connecting and combining different backgrounds. The organizer of the datathon mentioned:

> *"We like to see how they conceive problems and how they address them. If I have a problem and I ask for a solution to a mathematician or a sociologist, both would have different approaches".*

These ideas are not necessarily only for new products or services, they are also a means for improve existing products or to solve certain challenges and internal problems. For instance, the purpose of the datathon was use available data to measure a specific issue. A data analyst stated:

> *"To predict how many people will turn out of our games, we gave them (participants) access to a data set, and they had to make a model that predicts how many people will leave the game".*

These ideas are not necessarily only for new products or services, they are also means to improve existing products or to solve certain challenges and internal problems. For instance, the purpose of the datathon was to use available data to measure a specific issue.

ii) Finding unexpected solutions or problems.

According to the interviewees and our observations, the second way hackathons contribute to innovation in exploration activities is by helping to "*think out the box*" and see problems or solutions that insiders did not see before. These solutions and problems are unexpected in nature, in the sense that insiders did not take into account them before, consequently generate expectations or surprise. Some respondents mentioned that this because they are "*trapped in the daily activities of the organizations*". A product manager stated:

> *"Sometimes you get so used to working with your own data and you do not look with fresh eyes. People from outside come in and they have no history and they look with other eyes. So, some of the things that they have told us about the game, have surprised us and then we have added"*

An example of an unexpected solution occurred during the datathon. Participants presented a new model to explains consumption patter of game users, which drew the attention of different insiders, as the organizer of the datathon pointed out:

> *"Participants come up with different approaches that we would not have thought about. So we learn from them, and equally, they learn from us".*

Although the primary outcomes of hackathons are solutions, they are also a source to discover unexpected problems. An example occurred when some teams presented problems or *blockers* that they found in the games. This was a different contribution from the main objective of the event. We suggest that these unexpected outcomes may be caused by the "*informal and friendly environment*" where the datathons took place, which enhances free and open communication of ideas. The Chief of the Technology Office explained this assumption:

> *"One of the teams showed us that in the level 31 you could not buy some characters in the store, and then at the level 30 there was a weird change. And we did not realize that there were blockers in the game. Of course, we changed it".*

iii) Conceptualization of new products.

The third benefit of hackathons in exploration is the conceptualization of novel ideas for new products or services. Particularly, the game jam is a source for conceptualization in a participatory context. The company organizes these events as ideation contests with only one rule: "*a specific*

theme to frame ideation and to give people the freedom to come up with any idea". The organizer of the game jam explained:

"We gave them 48 hours to make a prototype of a game. Everyone from the company could go and play the game, and then vote which is the best one. That worked really well in creating new games and getting new ideas".

The outputs of the event were mainly prototypes that the company is testing nowadays, or they have served as inspiration for other projects. However, we noted that hackathons are not useful to create or conceptualize new products from scratch. Rather, they are quite effective *"to bring nice ideas or improve existing ones"*. A game producer remarked:

"They do not contribute to the creation of new games. In the end, is different the game that you create in two days and the game that actually you can release in the market. But probably we take some ideas from them and incorporate them into other games that we are working on".

Due to the nature of the hackathons (i.e. event over a short period of time), some issues arise that affect their effectiveness as ideation practices. For example, time constraints. During hackathons (datathon and game jam), all teams were in rush to finish and present their results, which led to anxiety or some frustration. Some participants mentioned during informal conversations that they did not have enough time to fulfill the project as good as they would have wished. The company is aware of this constraint, as a product manager said:

"Due to time constraints the chances to come up with a complete idea or project, are small. We can not do a good quality prototype in 48 hours. Yes, they do not have a direct impact on innovation, but they actually help us in conceptualization".

5.4.2 How hackathons contribute to innovation by enhancing some preconditions.

Innovation does not happen by chance or randomly, it requires different preconditions or necessary elements. In this sense and according to our data, we suggest that hackathons enhance some preconditions for innovation, specifically by i) attracting talent, ii) building a community of experts and iii) increasing motivation or the sense of achievement. In the next paragraphs, these elements are explained.

i) Attracting talent

Finding and retaining skilled staff is a key aspect to innovate. In this sense, the city of Barcelona is attracting international talent (Pareja-Eastaway and Pique, 2010; Pareja-Eastaway and Pradel, 2017). Nowadays, the city is considered one of the largest hub for technological industries in Europe, and the third most attractive for European startups (Pareja-Eastaway et al. 2017; Polo, 2018; Atomico, 2018), which has increased the battle for talent. As indicated by the Chief of the Analytics Office:

"It is difficult to get the talent that we want, we quite often look internationally".

In this sense, hackathons are a good source to attract skilled workers (in this case, ´data analysts´), as the Chief of the Technology Office pointed out:

"We do it for recruitment, so we want people to have the chance to experience our data, to see what it is like. And usually, high skilled people come to our hackathons".

Although this form of recruitment is not usual, Hackathons works as a *filter* or an indicator for passionate and skilled people. The Chief of the Analytics Office highlighted:

"To see who is willing to spend an entire weekend to go and play with data. And it is a pretty good indication for us that they are passionate".

Nevertheless, it is important to remark that hackathons have worked to attract specific talent, such as data scientist, programmers or developers. This situation is due to high demand of specialist in the data-science field. In an informal conversation, a datathon participant mentioned:

"We (data scientists) are looking for the best companies to work for. I mean, salary is important, but we care about the problems that the company is trying to tackle and what kind of data they have to work with".

To sum up, this is the strongest contribution of hackathons to innovation. All respondents mentioned this item (e.g. *"It has worked very effectively. We have hired at least 6 people"*) and at end of the event, organizers announced open positions and invited participants to apply.

ii) Building a community of experts

Another important contribution of hackathons is by helping to build a community of specialists. In this sense, Hackathons are becoming more popular in the local context. As an insider mentioned:

"We know there are many companies doing hackathons and people start to believe that there is an ecosystem and a community here. We want to be part of that community".

Nevertheless - and as earlier discussed - there is a lack of skilled workers in different fields (e.g. analytics, data science or programming), and some respondents consider that international talent that comes to Barcelona, perceive that there is no community (e.g. community of data scientists or game developers) in the city. The Chief of the Analytics Office remarked this:

"One of the problems we have is both Berlin and London are very strong on data and analytics, and the problem for people coming to Barcelona is that they perceive that there is no community (different fields) here".

Besides, different insiders mentioned that international talent has a perception of limited chances to get jobs in tech-companies and they are afraid that if it does not work in one company, there are no others where work in. This highlights the importance of building a community, because this could increase the attraction of talent, as The Chief of the Analytics Office said:

"They are worried that if for some reasons this company does not work as a place to work, there are no others similar companies to

work in. If you move to London and if it does not work, there are many
other companies recruiting there (datathon organizer)".

In this regard, interviewees suggest that building a community of specialists and conduct more Hackathons, could lead to position the city as a center of excellence (i.e. data analytics, video games, programming) and therefore attracting more talent. About this issue, a product manager pointed out:

"There is a range of groups trying to promote Barcelona as a center
of excellence in analytics, games or data science. So we want to
Barcelona to be knowing good for that, so we think hackathons could
help".

iii) Increasing motivation

Playful activities could create the right environment to enhance innovation by, for example, improving the sense of community, build better relations among workers or increase the people´s motivation. This is the last contribution of hackathons that we have found. The organizer of the game jam mentioned:

"We are a young company and one of our policies is 'work hard, play
hard'. We work very hard but in a fun way. By organizing hackathons,
we try to improve the team-building spirit and the good working
atmosphere".

Participants consider that hackathons are an excellent opportunity to work in a playful and challenging environment over a short period of time, which give a "sense of achievement". The organizer suggested:

"It is really nice showing people what is possible to achieve in just two days. Because you have to manage several activities but with some constraints. I think this is good for participants".

Besides, a hackathon is a single event that brings people together that otherwise would not be possible. It is a punctual, constrained and playful event. A game jam participant highlighted:

"It is a way to gather people, have fun and work towards an innovative project. It works very well to generate a sense of urgency, priority, and action".

5.5 DISCUSSION

Our results provide insights concerning how hackathons contribute to innovation in organizations. We have identified six different ways in which these collaborative practices contribute, on one hand, in exploration activities, and on the other hand, by enhancing preconditions for innovation (see Figure 5.3). The findings are in line with other research, but ours offer new insights not previously described. As revealed in this study and previous scholars (e.g. Briscoe, 2014; Chowdhury, 2012, Karlsen and Sundnes, 2017), hackathons have clear value for innovation and as well some handicaps. However, the relationship between these contributions, organizations and innovation literature, is not clear (Briscoe, 2014; Seo-Zindy and Heeks, 2017). This research suggests how these contributions for innovation are embedded in large organizations. The understanding of these contributions has different implications for theory, practice and future research.

Figure 5.3. How hackathons contribute to innovation in organizations.
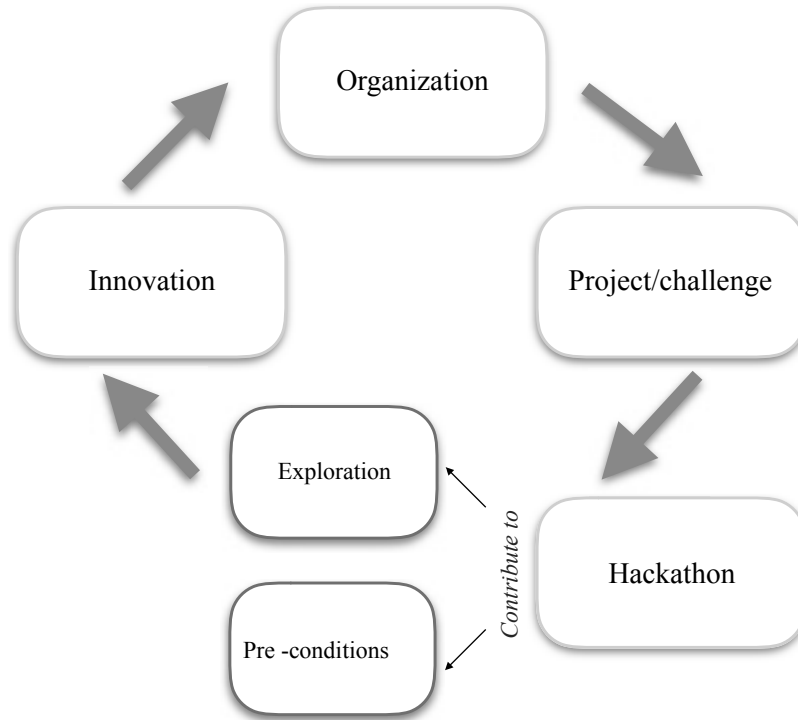
5.5.1 Implications for theory and research.

First, this study contributes to a domain of literature focused on hackathons as collaborative and innovation practices. These studies have contributed to understanding how hackathons enhance, for example, novel ideas, early prototypes, driving affordable technology, involving people to collaborate, accelerate technology innovation, business plan development or new company formation (Hunsinger and Schorock, 2016; Karlsen and Sundnes, 2017; Chowdhury, 2012; Briscoe, 2014; DePasse et al. 2014; Mantzavinou and Ranger, 2014; Olson et al. 2017; Silver et al. 2016; Cooper and Edgett,

2008; and Mohair et al. 2014). We build on this literature by offering new insights not previously described. For example, finding unexpected problems, attracting talent, building a community of experts and increasing motivation, have been factors not previously explained in those papers. By bringing these elements to the surface and examining in what context they occur, we shed more light on how hackathons contribute to innovation in large corporations. As well these findings improve the theoretical conversation and have important implications for approaching the topic in future studies.

Second, previous research has not theorized and framed the contributions of hackathons in terms of the innovation literature. In this sense, we supply a theoretical explanation using two innovation approaches. The first one, by suggesting that hackathons enhance exploration activities (March, 1991; Knight and Harvey, 2015). This is, when companies are looking for ideas, searching for new knowledge or resources in order to innovate. In this regard, hackathons might be a way to bring external elements that companies did not take into account. This contributes to the literature by framing hackathons as practices especially useful in exploration, and it provides an opportunity for a better positioning of hackathons in innovation studies. Second, to the best the author´s knowledge there is no previous research on hackathons and preconditions for innovation. Researchers on the topic of preconditions have identified several important factors to innovation, and as well different sources of these factors, such as the right environment, highly skilled employees or external knowledge (e.g Zahra and George, 2002; Edmondson and Nembhard, 2009; Mathisen and Einarsen, 2004). The present study builds on this literature proposing hackathons as a way to enhance some preconditions to innovation.

Especially, as a way to attract talent when is scarce, building a community of experts when is necessary, and improve motivation or the sense of achievement.

Along with the contributions of this paper, some limitations need to be acknowledged. Although we analyzed hackathons interviewing key respondents and conducting non-participant observation, this allowed us to capture only part of the explanation. In this sense, longitudinal studies might be beneficial to observe and to track deeper the benefits and handicaps of hackathons. There are also limitations with the study context. Given the nature of our research as inductive, we analyzed hackathons in one company in a specific sector. Future research might analyze different hackathons in various sectors and companies in order to conduct cross-comparison.

5.5.2 Implications for practice.

This research also contributes by identifying some valuable insights for practitioners. In recent years hackathons have become more usual activities in organizations. Nevertheless, there are some critiques about their utility and sometimes companies misunderstood the process and the possible outcomes (Olson et al. 2017; Karlsen and Sundnes, 2017). This paper could help to practitioners by explaining that these events are suitable for exploration, not for exploitation. In other words, when an innovation project is at early stages and it needs inputs from various approaches. Another insight for practitioners is in regard to the nature of the hackathons as a collaborative activity, which could enhance a better work environment or build stronger teams.

5.6 CONCLUSIONS

Hackathons have erupted in organizations as collaborative and innovation practices. The literature to date speaking to the impact of hackathons on innovation has been focused on different fields with no regarding for the organization where they take place, and they ignored innovation studies to position their findings. This conventional perspective occasioned substantial progress in understanding how hackathons contribute to innovation, nevertheless scholars have claimed for deeper studies to link hackathons with organizations and innovation literature. This study brings new evidence on this issue and positions the findings in innovation literature for better understanding.

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CHAPTER 6

Conclusions

6.1 MAIN CONCLUSIONS

As it has been mentioned in this dissertation, creative industries have gained increasing importance in economic and academic agendas due to their capacity to innovate. The literature to date speaking about their innovation patterns has analyzed innovation from different perspectives (e.g Tschang et al. 2006; Verganti, 2006; Hotho and Champion, 2011) but in a separate way, dedicating reduced effort to research the innovation process itself which is rarely mentioned and it has been scarcely theorized (Knight and Harvey, 2015). In this sense, technology plays a key role in innovation processes, and the emergence of new technologies, such as digital platforms, big data tools, among others, have deeply affected CIs. These technologies, in turn, have created or changed managerial practices in the innovation process.

With the aim of covering the gap of the innovation process in creative industries and to shed more light on how technological change has led to the emergence of new practices in the innovation process, this thesis presents a compendium of four contributions (papers). Each contribution addresses different questions related to the innovation process, technological change and new practices, giving detailed explanations of background, methods, results, conclusions, limitations and avenues for future research. A summary of contributions is presented in table 6.1

The first paper (chapter 2) has conducted a literature review in different creative sectors in order to propose a model that represents the entire innovation process from exploration to the exploitation phases; this is the main contribution of the paper. As well, it suggests a research agenda in the study field.

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Following this research agenda, the second paper (chapter 3) is focused on the innovation process in a specific creative sector, the mobile games, and new practices that have been introduced due to technological and market changes. Based on data collected in 14 companies, the results provide insights about the innovation process in mobile games, which also is an example on the impact of the introduction of new technologies and market changes on this process.

Paper 3 (chapter 4) goes deeper into the effects of new technologies on the innovation process. Using the context of mobiles games, this inquiry analyzes how digital platforms have changed and introduced new practices. With a qualitative and grounded-theory approach (50 interviews with professionals) it has developed a typology of new practices that have been mainly introduced by digital platforms: a) Continuous creation process in real-time, b) Earlier access to data, c) Data collection in real-time. This means that due to platforms these practices are new or are conducted more often than before. And three major changes caused by digital platforms: d) A more empirical innovation process, e) Contingency revenues streams, f) New work structures and roles.

Table 6.1 Conclusions presented in the main chapters

Main implications and contributions	
Chapter 2 (Paper 1) How do creative industries innovate? A literature review and a model proposal	A research agenda and a theoretical model that explains the innovation process in creative industries. The model helps in having the global picture of the IP and thus, allows the decision-making and the strategies setting. To the best of the authors' knowledge, this is the first study exploring proposing a model for the entire process in creative industries.
Chapter 3 (Paper 2) Innovation process in creative industries: insights from the mobile games sector	The study revealed an emergent data-driven innovation process. Different technologies and market changes have led to this situation. The innovation model proposed could provide a framework to companies to manage a more empirical innovation process where data play a key role.
Chapter 4 (Paper 3) The impact of new technologies on managerial practices and organizations: The case of digital platforms on the innovation process	The results show that digital platforms have introduced new innovation practices such as a creation process in real time, and they have reorganized others, such as internal structures. The study extends the theory of technological change and its impact on organizations by bringing factors produced by digital platforms to the surface, and examining how they have reorganized or introduced new practices in the innovation process.
Chapter 5 (Paper 4) How do collaborative practices contribute to innovation in large organizations? The case of Hackathons.	Hackathons contribute to innovation by promoting exploration activities, such as new external solutions, and by enhancing some preconditions for innovation, such as attracting talent or building a community of experts. The research contribute to the existing research by positioning the results in innovation literature and by explaining contextual and relational factors not previously described. In addition, for practitioners it presents insights on how hackathons may enhance innovation in corporations.

The last paper (chapter 5) is focused on the emergence of collaborative practices in the innovation process, specifically the hackathons. Drawing on a single case study of a big mobile games company, and using data from analytical interviews and non-participant observation, the results point out that these practices contribute to innovation mainly in 'exploration' activities, for instance, by finding new external solutions and ideas. But it also contributes by enhancing some 'preconditions' for innovation, such as attracting talent or building a community of experts. This research contributes to the literature of new innovation practices in different ways: by extending the understanding of how hackathons contribute to innovation in organizations, by bringing new factors not previously described in the literature, and by framing this evidence in innovation literature.

With these four essays, both theoretical and empirical, framed in the mobiles sector, we have shed more light on the innovation process issue in creative industries, and how technological changes (new technologies) have led to the emergence of new practices.

6.2 ACADEMIC AND PRACTICAL IMPLICATIONS

With the contributions of each chapter have been briefly explained, it is now time to assess its usefulness for advancing in the innovation process literature in creative industries, and specifically in the understanding of the technological change and new practices phenomenon.

Academic implications of this work are first, the exploration and organization of existing literature regarding the topic of innovation processes in creative industries, the impact of technological changes on the

innovation process in creative industries, and the emergence of new innovation practices, specifically the hackathons.

In the second place, this work also is aligned with some of the methodological demands suggested in the literature. Firstly, we have taken into account some suggestions made by different authors in the creative industries and innovation literature, for instance, Pick et al. (2015), Townley et al. (2009) and Knight et al. (2015) who have claimed for more theories on the innovation phenomenon in creative industries. Other authors in the field of technological change and its effects on the innovation process, have claimed for more and deeper research in this direction (Gawer, 2014; Barley, 2015; Kelley et al. 2016a). And regarding the emergence of new practices, such as hackathons, Seo-Zindy et al. (2017) and Briscoe (2014) suggest that is necessarily gaining a deeper understanding of this phenomenon in organizations. In this sense, this dissertation is grounded in empirical work based on qualitative methods, which is suitable at the first steps of approaching a new phenomenon or theory, because it is necessary to provide the basis of understanding needed to advance in the field. In this work has been used single and multiple case studies, and the grounded theory approach to construct theory from qualitative data collected via interviews and non-participant observation in different organizational settings. These methods allow investigating complex contemporary problems in real environments and it provides richer data than quantitative methods (Strauss et al. 1992; Reichertz, 2014; Creswell, 2013). All in all, the present work has fulfilled the methodological demands.

In the third place, the chapters of this thesis include empirical exercises in the field of the innovation process in creative industries, technological

change and its effects on the innovation process and the emergence of the new practices, something that has not been explored very much in creative industries and innovation literature. This contributes by bringing to the surface interesting novelties and theories. In this sense, this dissertation provides four main theoretical contributions.

Firstly, we have analyzed existing innovation process literature in creative industries, and we have proposed a model which explain the process from the exploration to exploitation phases. So far, different academic contributions have been separated and scattered, this work links those contributions in order to build the model. To our knowledge, this is the first study exploring proposing a model for the entire process.

Secondly, based on the case of mobile games, we have proposed an innovation process model. This model explains how mobile companies explore, develop and commercialize new products/services in an iterative way, and it is compatible with adaptive models and project-based organizations, where high uncertainty plays a key role and is important to manage. Whilst some literature highlights that the innovation process has a beginning and an ending (e.g. Rothwell, 1994; Hobday, 2005; Salermo et al. 2015), we noted that in mobile games it is a continuous process that extends the product lifecycle, converting a product (game) in a service after the market launch. This is mainly because of the introduction of new technology and sectoral changes that have reorganized the industry.

Thirdly, we have contributed to understanding the impacts of new technologies on the innovation process in creative industries. The results of the third paper are consistent with other studies that have analyzed the impacts of technologies on work or processes (e.g. Barley, 2015; Turban et

al. 2009; Van Hoose, 2011; Demaerschalk et al. 2012), but our research provides insights on a specific technology, the digital platforms, and a certain process, innovation. In this sense and following Barley (2015), Gawer (2014) and Kelley et al. (2016a), there is not enough research on how internet technologies have altered processes in organizations. In this study, we have shed more light on how digital platforms has altered the innovation process in a creative sector. The paper also contributes to a small domain of literature on how digital platforms are improving the innovative capacity of organizations (Downes and Nunes, 2013, 2014). This also expands the understanding of how the internet has disrupted in organizations and their managerial practices (Demaerschalk et al. 2012; Barley, 2015).

Finally, another important contribution is in regards to the emergence of new collaborative practices (hackathons) and how they contribute to innovation in creative industries. The fourth paper builds on different literature (e.g. Chowdhury, 2012; Briscoe, 2014; Olson et al., 2017; Silver et al. 2016) by offering new insights on how hackathons enhance innovation in organizations. For example, attracting talent, building a community of experts and increasing motivation, are factors not previously described. By bringing these elements to the surface we have developed new knowledge on the field. As well these findings improve the theoretical conversation and have important implications for approaching the topic in future studies.

Practical implications include a framework for creative industries to manage a more empirical innovation process where data play a key role. The identification of barriers and opportunities in using new technologies to

boost creative and innovation tools. And a better explanation of hackathons as innovation and collaborative tools in organizations.

6.3 LIMITATIONS AND FUTURE LINES OF RESEARCH

Along with the contributions of this work, some limitations need to be acknowledged and therefore explain some opportunities for future research. The model proposed in chapter 2 is a theoretical contribution, therefore we suggest test it empirically. Chapter 3 is focused on one creative sector, future research should go further and analyze closer the impact of new technology in other creative industries. Also, a longitudinal study could be interesting to understand the evolution and innovation process changes in this and other creative sectors. In chapter 4, we analyzed a single and booming sector, and so it is not possible to generalize to other industries. Further studies may analyze different sectors in order to obtain cross comparisons. The inductive method employed in this study provides rich descriptive data grounded in the experience of different professionals working in several companies. Nevertheless, this is not suitable to test causality. Survey research to test the theoretical ideas developed would be beneficial.

In regard to chapter 5, longitudinal studies might be beneficial to observe and to track deeper the benefits and handicaps of hackathons. There are also limitations with the study context. Given the inductive nature of the research, we analyzed hackathons in one company in a specific sector. Future research might analyze different hackathons in various sectors and companies in order to conduct cross-comparisons.

We hope that the results and contributions obtained in this dissertation, inspire interesting new future research lines to enrich the existing literature on the innovation process phenomenon in creative industries.

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ANNEX I
Case study protocol, interview guide and invitation letter (chapter 3).

ANNEX I. A Interview guide: Innovation process in mobile games

Interviewee	Main data source	Other data sources	Notes
	Interviews or observation		Ask for other respondents

Interview protocol

First of all, thanks for your interest on this project. I remind you that the main purpose of this research is understand the creation process of new mobile games. During the interview I will be taking notes and I will record the conversation in order to don not miss important information. Is this ok ?

....

Rapport

1. What is your role at this organization and specifically in the production process of new games?

2. What activities develop the company in this studio?

General questions

3. Please, could you describe the innovation process of mobiles games from the beginning?

4. Is there a framework or guidelines from the company, which guide or framed the creation of new video games?

Ideas items

5. How do you start to create an idea? Who can propose it? What is a good and a bad idea?

6. How do you evaluate these ideas? Why do you choose an idea and no others? Who make this decision?

7. Is a decision based on artistic or business issues?

Development items

8. Speaking general, How do you organice the teams? How do you manage the different tasks?

9. Do you use some project management tools?

10. During all this process, do you use external partners to develop some part of the project?

11. How the studio is structured?

Diffusion items

12. Before the global launch of a new video game, do you conduct some pilot tests?

After global launch items

13. What happen after the global launch?

14. Is the process different from the previos creation activities? Is the team different?

Technology and market items

15. What market issues you consider play an important role in the creation process of mobiles games?

16. What technologies play an important role in the creation process of mobiles games?

17. What is the roll of the digital platforms like Google play or Apple store in the creation process?

Notes

What have we learned?

ANNEX I. B Invitation letter

<div align="right">"Date"</div>

"Company name".

"To whom it may concern"

My name is Cristian Granados and I am a PhD student at the University of Barcelona. Together with Dr. Montserrat Pareja and Dr. Merce Bernardo, we are conducting a research project named "Innovation process in creative industries". The aim of the project is to expand the knowledge of the innovative activity of creative industries, and the role of technological and market changes on it. We would hereby like to invite to participate in this research.

If you decide to participate, an interview would be arranged at a time and place of your convenience. The interview would last about 1 hour. During this interview I will ask questions about three major items:

A. General questions about your job and the company

B. The innovation process approach of your company

C. The role of market and technological changes on the innovation process of your company.

The information will be kept private and confidential. This is a personal research only for academic purposes. If you have any further questions about the research, please feel free to contact me (crisgrasan@icloud.com, 671849531).

Thanks in advance.

ANNEX II
Interview guide (chapter 4)

ANNEX II. A Interview guide: digital platforms and the innovation

process.

1. Please, explain what is your role at this organization.

2. How the mobiles games sector has changed over the last years?

3. Do some technological changes have influenced the mobiles games sector and therefore mobiles games companies?

4. What is the role of the digital platforms like Google play or Apple store in the innovation process of mobile games?

5. Do you consider that with the introduction of digital platforms the mobile games industry has changed?

6. Specifically, how does the innovation process has changed?

7. Is the process different because of the platforms?

8. Have they introduced new practices in the creation process?

9. What are the benefits of the digital platforms? Problems?

10. Are their guidelines important for the creation?

11. What other aspects do you consider digital platforms have changed in your company? e.g. Value chain? creation activities?

Notes

What have we learned?

ANNEX III
Interview guide, non-participant observation guide and data collection form (chapter 5)

ANNEX III. A Interview guide: contributions of hackathons to innovation

1. Please, explain what is your role at this company.

2. What a hackathon, a datathon and a game jam is?

3. Why organize these kind of events?

4. What is the main idea behind these practices?

5. Please explain some examples of hackathons that you have organized.

6. What benefits bring to this organization?

7. How do they contribute to innovation in this organization?

8. *Several follow up questions regarding to the number 7. e.g. How do you think hackathons help to improve this situation?*

9. Is a new innovation practices?

10. Do you think hackathons are participatory events?

11. Tensions between daily activities and game hackathons.

ANNEX. III. B Non-participant observation guide

What have we observed? How hackathons contribute to innovation?		
Items/codes	**Evidence**	**Context (daytime and place)**
e.g external ideas		
e.g building a community of experts		

ANNEX. III. C Non-participant observation protocol

Code	Observation during datathon	Occurrence 1. rarely 2. sometimes 3. often 4. very often