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Managing Digital Open Innovation with User Communities

A Study of Community Sensing and
Product Openness Capabilities in the
Video Game Industry

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Abstract

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Digital and open innovation has changed how product innovation occur and how it is managed by firms. Digital technology as an enabler of increasingly distributed innovation processes has in particular impacted firms' abilities to draw on, and leverage, large numbers of external users and user communities to develop their offerings. In the video game industry, firms have developed and honed capabilities to utilize user communities as sources of information and modular user innovations. Empirical evidence of the performance effects in product innovation as well as conceptualizations of these capabilities is however lacking in extant research. Grounded in a dynamic capability perspective, this dissertation puts forward two capability concepts and tests their effects empirically in the context of the video game industry. First, the concept of a community sensing capability captures the firm's ability to identify and internalize innovation-conducive information from user communities. This capability entails managing openness in the firm's innovation processes. Second, the concept of a product openness capability relates to the firm's ability to create and manage products functioning as platforms for continuous development and coupling of internal and external innovation. This, in turn, involves managing openness in individual products. Using both qualitative and quantitative methods, these capabilities are examined at the project level of analysis in relation to the financial performance of products and the speed of development processes. The findings show the capabilities to be indirectly related to the financial performance of products. The application of community sensing capabilities in development of video games increases the amount of information about user needs, demand and product use possessed by the firm, which in turn positively impacts performance. Designing products open to external innovation by users in turn increases the development speed of products, which positively impact the financial performance of products. The two capabilities are also shown to be interlinked as community sensing has a positive impact on product openness. The dissertation contributes at the intersection of open and digital innovation in addition to previous work on sensing capabilities. The work also holds practical relevance by showing the potential of utilizing user communities for digital product innovation.

Keywords: User communities, open innovation, dynamic capabilities, video game industry

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List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

- I Ek, P. “Opening the black box: A review of micro-level research in open innovation”.
A previous version of this paper was presented at the 78th Annual Meeting of the Academy of Management, Chicago, US., August 2018.
- II Ek, P. “Leveraging user communities in digital product innovation: Community sensing and product openness capabilities in the video game industry”.
Under revision for resubmission to Journal of Business Research.
A previous version of this paper was presented at the 78th Annual Meeting of the Academy of Management, Chicago, US., August 2018.
- III Ek, P. “Two types of openness to leverage user communities in the video game industry: Community sensing and product openness”.
Under review for California Management Review.
A previous version of this paper was presented at the 4th World Open Innovation Conference, San Francisco, US. December 2018.
- IV Ek, P. “Community sensing capabilities in the video game industry: Utilizing information in user communities to impact product performance”.
Submitted to International Journal of Innovation Management.

Contents

1. Introduction.....	9
A new innovation landscape.....	9
A need for capabilities to manage DOI	11
A need for novel conceptualizations of DOI	12
Aim of the dissertation.....	14
Development of research questions.....	14
Community sensing	15
Product openness	18
Research approach.....	20
Structure of dissertation summary.....	22
2. A capability perspective of DOI	23
Dynamic capabilities	24
Classes of capabilities	27
Conceptualizing community sensing capabilities.....	29
Conceptualizing product openness capabilities	32
3. Methods	35
Literature review method	36
Search method	37
Analysis and review procedure.....	40
Qualitative method	41
Case method and selection.....	42
Qualitative data collection	42
Qualitative data analysis	45
Quantitative method	48
Survey design	48
Scale development.....	49
Quantitative data collection	51
Population and sample characteristics	52
Quantitative data analysis.....	55
4. Summary of papers	57
Paper I: Opening the black box: A review of micro-level research in open innovation.....	57

Paper II: Leveraging User Communities in Digital Product Innovation: Community sensing and product openness capabilities in the video game industry	59
Paper III: Two types of openness to leverage user communities in the video game industry: Community sensing and product openness.....	61
Paper IV: Community sensing capabilities in the video game industry: Utilizing information in user communities to impact product performance.....	62
5. Main findings and conclusions	65
Community sensing capabilities.....	65
Product openness capabilities.....	68
Linking community sensing and product openness.....	73
Theoretical contributions.....	75
Managerial implications	77
Applying community sensing	77
Applying product openness	78
Implications for future research	78
Conclusions	81
References.....	82

1. Introduction

A new innovation landscape

An innovation is the sum of a theoretical conception or idea, a technical invention and its exploitation or use (Roberts, 2007; Trott, 2012). While product innovation has been, and remains, central to a firm's performance (Schumpeter, 1934), the innovation landscape of the modern economy is undergoing rapid change. This is a change partly driven by the increasing use of *open innovation* (OI) (Bogers, Chesbrough and Moedas, 2018; Chesbrough, 2003), defined as “a distributed innovation process based on purposively managed knowledge flows across organizational boundaries” (Chesbrough and Bogers, 2014:17). It is also a change fundamentally influenced by pervasive digitalization, the transformation and structuring of processes around digital technology (Brennen and Kreiss, 2016; Yoo, Lyytinen, Thummadi and Weiss, 2010). This change brings important structural shifts to how offerings are innovated in most sectors and is not something confined to selected parts of the economy (Nambisan, Lyytinen, Majchrzak and Song, 2017). Its importance can also be seen among leading firms globally. Measured as market capitalization, the four largest firms in the world—Apple, Alphabet, Microsoft and Amazon.com (PwC, 2018)—all have business models centered on digital technology and also utilize OI practices in some form. Apple's App Store and Google's (owned by Alphabet) Google Play both function as platforms relying on ecosystems of external complementary innovators (Yoo, Boland, Lyytinen and Majchrzak, 2012). Amazon.com has, in turn, developed a platform for micro-tasks (Deng, Joshi and Galliers, 2016), while Microsoft is advancing in open source software (Andersen, 2018).

The impact of digital innovation on business requires new and adapted forms of management, as digital innovation can be seen as something decidedly different from non-digital innovation (Yoo et al., 2012). Centered around “the creation of (and consequent change in) market offerings, business processes, or models that result from the use of digital technology” (Nambisan et al., 2017:224), digital innovation is transforming business models and entire industries (Hui, 2014; Iansiti and Lakhani, 2017). In parallel, OI has become widely adopted (Schroll and Mild, 2012), partly because of the structural changes brought by digitalization and digital technology (Chesbrough and Bogers, 2014:16). In fact, as technology develops and be-

comes more pervasive in business, digital and open innovation are becoming entangled movements. Driving this change is the fact that the knowledge and information resources required for innovation are increasing, and firms more and more *need* to search their external environment to compete successfully (Chesbrough, 2003). This necessitates a shift in the locus of product innovation toward the boundary of the firm. At the same time, a greater integration and utilization of externally located information is more promising than ever, as costs of interaction and knowledge transfer decrease as digital technology develops (Yoo et al., 2012). Digital technology enables the distributed innovation process advocated by OI research through greater connectivity, facilitated information transfer and permeable and malleable products (Yoo et al., 2012). It is therefore becoming increasingly relevant to examine *digital open innovation* (DOI) as a distributed innovation process enabled and facilitated by digital technology and digitalization.

This intersection of OI and digital innovation is continually creating new opportunities for the management of innovation. The facilitation of information transfer between dispersed actors makes new innovation strategies possible (Nambisan et al., 2017). Digital technology also enhances the potential of, and facilitates the implementation of, OI processes and more open business models (Chesbrough, 2006; Gassmann, 2006). In particular, search breadth, i.e., the number of external sources relied upon in innovation processes (Laursen and Salter, 2006), is impacted as it is becoming increasingly effective to draw on a large number of external complementors (Boudreau and Lakhani, 2013; Schweitzer, Buchinger, Gassmann and Obrist, 2012). Indeed, one of the largest and most significant changes in this new environment is the scope and scale with which it is becoming possible, and feasible, to involve external crowds and communities of users in product innovation. Firms can utilize and leverage external sources of innovation at a hitherto unprecedented scale, effectively involving hundreds if not thousands of internationally dispersed individual contributors in innovation processes (Franke, Keinz and Klausberger, 2013). Utilization of different forms of crowdsourcing (e.g. Piezunka and Dahlander, 2015; Piller and Walcher, 2006) and innovation in user communities (Jeppesen and Molin, 2003; Koch and Bierbamer, 2016; Parmentier and Gandia, 2013; Parmentier and Mangematin, 2014; Postigo, 2007; Piller and Walcher, 2006) are demonstrations of this. In industries like the video game industry, firms have developed dedicated processes to leverage crowds and groups of unpaid and intrinsically motivated users to enhance their internal development processes and complement them with user external innovation (Koch and Bierbamer, 2016; Parmentier and Mangematin, 2014). In the context of managing DOI with users, research can be informed by examining product innovation in this type of setting. Studying how this is done, in terms of the management processes and capabilities of these firms, is important to understand a facet

of how firms can succeed in this new innovation landscape. This is the subject matter of this dissertation.

A need for capabilities to manage DOI

In a context characterized by DOI, the role of the firm is increasingly to draw on external sources of innovation and to enable and facilitate innovation processes that at least partly lie outside its control through processes made possible by digital innovation and technology. In this new landscape, firms find that the boundaries of the firm, innovation processes and products become increasingly permeable (Chesbrough, 2003; Nambisan et al., 2017; Yoo, Henfridsson and Lyytinen, 2010; Yoo et al., 2012; Zittrain, 2006). As a result, firms need new and adapted capabilities to effectively manage DOI, not the least in contexts of innovation with large numbers of external users outside the control of the firm. In this area, extant research can initially help outline and describe these capabilities, while more research is needed to examine them further. What in strategy research is termed a *dynamic capability* captures “the firm’s ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments” (Teece, Pisano and Shuen, 1997). Dynamic capabilities are the sources of value creation and value capture mechanisms in the firm (Katkalo, Pitelis and Teece, 2010) and are constituted by processes and capacities residing on lower levels (Helfat et al., 2007; Teece, 2007; Teece et al., 1997; Winter, 2003; Zahra, Sapienza and Davidson, 2006). These facilitate the development, combining and recombining of resources, and innovation located both internally and with external actors in the firm’s ecosystem (Schilke, Hu and Helfat, 2018). Effective dynamic capabilities allow the firm to respond to emergent opportunities, co-evolve with its environment and continuously adapt its market offerings. These are critical abilities to the management of DOI, which is fundamentally associated with the utilization of internal and external resources to innovate and create value. As OI is fundamentally a tool to change the resource base of the firm, an effective OI capability is a dynamic capability (Chesbrough, 2018).

In the video game industry, both smaller and larger firms have honed processes and developed dynamic capabilities applied in the development of products to utilize user communities as external sources of innovation and innovation-conducive information. In this context, the development of individual products does not end at product launch, but can continue throughout the product’s life-cycle (Jeppesen, 2004; Koch and Bierbamer, 2016). This is important for the performance of the product and makes the firm able to continue to adapt and innovate individual offerings to changing conditions. For years this industry has been at the forefront of using digital and OI processes for this purpose. As a result, the video game industry presents ample opportunities to examine dynamic capabilities to manage DOI with user

communities. Here, user communities commonly form around existing and anticipated products, gathering a diverse and highly involved crowd of internationally dispersed users online. These user communities are potent sources of innovation (West and Lakhani, 2008; West, Salter and Vanhaverbeke, 2014), and video game firms are particular adept in drawing on these sources to enhance product innovation. Via primarily intrinsic motivations (Wiertz and de Ruyter, 2007), users freely and significantly contribute to firms' product development processes and engage in ideation, testing, co-creation and independent innovation (Koch and Bierbamer, 2016; Nambisan and Baron, 2007; Parmentier and Mangematin, 2014). The community both nurtures digital innovation by enabling interactions and information exchange and provides a channel for the diffusion of modular user innovations that increase the value of the firm's products. How these processes are managed, and what this entails in terms of the capabilities of the firms that do this successfully are, however, areas with significant knowledge gaps. Extant research has not sufficiently examined what capabilities firms that successfully leverage user communities have, or the processes and practices that underpin them. In addition, there is only scant evidence of what the performance outcomes and implications are from employing such capabilities in digital product innovation. While previous research has investigated different aspects of openness to external user communities in the context of digital product innovation (e.g., Burger-Helmchen and Cohendet, 2011; Parmentier and Gandia, 2013; Parmentier and Mangematin, 2014), few of these works have examined its outcomes and effects on performance (Koch and Bierbamer, 2016). Contributing to filling these gaps is an important rationale for this dissertation.

A need for novel conceptualizations of DOI

As changes brought by DOI affect how innovation processes are managed by firms, they also have implications for the theories that describe and prescribe these processes. In many areas, established theories of the management of innovation are not up to par to describe and infer normative implications in this new environment (Chesbrough, 2003; Lyytinen, Yoo and Boland, 2016; Nambisan et al., 2017). What is required in this area as a result is nothing short of a re-examination of assumptions and theory of the agency, locus of innovation and demarcation between process and outcome (Nambisan et al., 2017). This is particularly evident when considering OI with communities of users. Here, digital technology and innovation call for new forms of management of, and interaction with, large groups or crowds, rather than single individuals and lead users (Parmentier and Mangematin, 2014).

OI has, as a field, partaken in the formulation of new theories that better describe, and prescribe, new forms of innovation utilizing external sources and innovation management that cross firm, process and product boundaries

(Randhawa, Wilden and Hohberger, 2016). Dynamic capabilities related to the management of openness, and how these create value and impact performance are, however, areas identified as requiring more work (Chesbrough, Lettl and Ritter, 2018). More specifically, there are knowledge gaps concerning how firms manage OI in digital community settings where non-pecuniary motivated users provide specialized information and constitute sources of complementary innovation (Bogers et al., 2016; Chesbrough et al., 2018; Piller and West, 2014). Previous research has primarily examined open source software (e.g., Dahlander and Magnusson, 2005; Langlois and Garzarelli, 2008; West and O'Mahony, 2008), where the external innovating actors are significantly different from consumer users, or focused on the nature of communities, or how and why users innovate (e.g., Dahlander and Frederiksen, 2012; Jeppesen and Frederiksen, 2006). Examining dynamic capabilities to leverage user communities in DOI, and investigating their impact on performance, contribute to filling these gaps. In this area, it is of both practical and scientific interest to not only examine the opening up of innovation processes, but also their performance implications where the evidence to date is mixed across the board (Asakawa et al., 2010; Chiang and Hung, 2010; Kim and Park, 2010; Knudsen and Mortensen, 2011; Laursen and Salter, 2006; Tranekjer and Søndergaard, 2013) and largely lacking in the user community context (Koch and Bierbamer, 2016).

OI is, however, primarily a firm-level concept addressing strategy and processes at this level (Bogers et al., 2016). But while residing partly at the firm level, important aspects of DOI with user communities primarily relate to individual innovation processes and products. This requires a shift in focus to lower levels of analysis. Openness to communities and crowds does not primarily reside at the firm level, but comes to the fore at the level of individual development processes and products (Jeppesen, 2004; Koch and Bierbamer, 2016; Parmentier and Gandia, 2013; Parmentier and Mangematin, 2014). In addition, there is also a growing emphasis in OI on lower-level heterogeneity (e.g., Du, Leten and Vanhaverbeke, 2014; Salge et al., 2013; Thanasopon, Papadopoulos and Vidgen, 2016; Tranejekjer and Søndergaard, 2013; Vanhaverbeke, Du, Leten and Aalders, 2014) aimed at producing more proximate findings and theory—as product innovation, in practice, rarely occurs at the firm level, but in innovation and development projects (Haas, 2010; Hobday, 2000; Shenhar and Dvir, 2007; Sydow, Lindkvist and DeFillippi, 2004). An examination of capabilities to manage DOI with external user communities is therefore best suited to lower levels of analysis than the firm. This is the analytical perspective adopted throughout this dissertation.

Aim of the dissertation

The discussion has so far identified a broader need for more work on the management of DOI (Chesbrough, 2003; Lyytinen, Yoo and Boland, 2016; Nambisan et al., 2017) and specific knowledge gaps relating to capabilities needed to leverage user communities in DOI, their underpinning processes at lower levels, and their performance outcomes (Bogers et al., 2016; Chesbrough et al., 2018; Piller and West, 2014). The dissertation attempts to fill these knowledge gaps by investigating the applications of such capabilities in product innovation, within the context of the video game industry. This can be summarized in the following aim which guided this work:

The dissertation aims to examine video game firms' dynamic capabilities to leverage user communities in digital open innovation of products.

As has been pointed out, focusing specifically on the capabilities of video game firms is not an arbitrary choice of research context. The structural changes brought by DOI are pervasive across sectors (Nambisan et al., 2017; Yoo et al., 2012), but nowhere are they more pronounced than in the purely digital industries (Gandhi, Khanna and Ramaswamy, 2016). Many of the technologies, management practices and processes that emerge here eventually disperse to other settings as well (Yoo et al., 2010a, 2012), making industries like the video game industry suitable for the identification of novel practices, theory development, and as testbeds for predicted relationships that relate to DOI. The phenomenon of video game firms drawing on and utilizing user communities for product innovation is, to a great extent, enabled and facilitated by developments and changes also visible in the wider business environment. While the video game industry is in one sense a non-traditional and distinct environment, structural changes such as digitalization, digital innovation and transitions to more open and collaborative innovation processes are pronounced, but not unique, characteristics of this sector. As a result, the video game industry offers opportunities for the examination of processes caused, enabled or otherwise affected by changes to the innovation landscape, but that also generalize to other settings. In sum, it constitutes a particularly interesting and rewarding area for research and theory development on the capabilities of firms managing new forms of innovation that draw on external user communities.

Development of research questions

Two dynamic capabilities are discussed in this dissertation that are central to managing DOI with user communities in the video game industry. The first is a community sensing capability that, through openness in the innovation process, identifies and internalizes innovation-conducive information from

communities. Research in marketing and strategy has outlined sensing capabilities as means to identify and internalize information located with market actors, and to define and act on opportunities for product innovation (Day, 1994; Teece, 2007). To conceptualize community sensing, research on user communities (e.g., Burger-Helmchen and Cohendet, 2011; Jeppesen, 2004; Parmentier and Mangematin, 2014) also serves as an important foundation in addition to these perspectives. The second is a product openness capability that leverages openness in individual products to couple internal development with external innovation in user communities to innovate products throughout their life-cycle. The concept of a product openness capability integrates previous work on innovation platforms (e.g., Gawer and Cusumano, 2002; Meyer et al., 2017), user innovation in the video game industry (e.g., Koch and Bierbamer, 2016; Parmentier and Gandia, 2013) and dynamic capability perspectives. Both concepts draw on extant research in analogous fields to capture abilities of firms to manage DOI with user communities in order to drive product innovation. In addition to answering calls for more research at the intersection of open and digital innovation (Bogers et al., 2018; Nambisan et al., 2017), the dissertation thereby also contributes to further integration and use of analogous theory in OI through the development of these concepts (Randhawa et al., 2016). These capabilities are both related to characteristics of DOI which hold implications for, affect and enable openness to user communities, and consequently also define the capabilities needed to leverage it effectively. In the following, research questions regarding these capabilities are outlined that served as focuses for the empirical investigations in this dissertation.

Community sensing

Digital technology makes individual innovation processes more permeable, where in- and out-bound information flows (Gassmann and Enkel, 2004) are both facilitated and made more effective. The decreasing costs and increasing efficiency of transferring information have given firms greater abilities to involve external actors like users (Yoo et al., 2012). Firms are thereby better equipped to internalize external information and open up innovation processes, share information and engage in co-creation with users as digital technology becomes pervasive to innovation processes. Two aspects in particular enable and significantly increase the potential of leveraging openness to user communities at the innovation process level. First, digital innovation's malleable and reprogrammable properties (Zittrain, 2006) allow it to be changed over time in an innovation process that is continuous and ongoing. As mentioned, it is common for firms in the video game industry to develop products throughout their life-cycle by expanding their scope, updating systems and adapting them to changing user needs and technological developments (Jeppesen, 2004). Second, the decomposable and modular

nature of digital innovation facilitate a distribution of innovation (Yoo et al., 2012), which allows a firm to tap external information in specific parts of this ongoing and continuous innovation process. This makes the firm better able to effectively share information about aspects of development, and also to involve external users in specific parts of the innovation process. It facilitates external ideation, testing and problem-solving, as the firm can direct its and users' attention toward specific features, content or systems. This, in turn, provides the firm with both opportunities and a stronger impetus to identify and internalize information about user needs and demand related to its ongoing development and product innovation efforts. Video game firms are among the leaders in managing these aspects to internalize external information about user needs and demand from user communities. Examining their practices can thereby inform research on the management of DOI with user communities.

A user community consists of diverse, and potentially highly skilled, individuals who develop advanced knowledge about the products that they use. These are partly lead-users (von Hippel, 1986), but also individuals and groups specialized in technical, product-use and testing aspects of games (Burger-Helmchen and Cohendet, 2011). As a result, information about current and future user needs, latent demand and product use contained in user communities is both broader and more up-to-date than what the firm can hold internally (Jeppesen, 2004). From the firm's perspective, user communities contain innovation-conducive information and knowledge, partly located with individual users but also embedded in interactions between users (Füller, Jawecki and Müllbacher, 2007; Hau and Kim, 2011; Jeppesen, 2004). Its generation is constantly ongoing as long as the community is active and users interact, discuss and analyze content and aspects of games as well as user innovations and modifications. These interactions result in relatively enduring forms of information, as the majority of community interactions, as a rule, occur on firm- or third-party-hosted online forums. Openness to this type of information is an important knowledge source for video game firms, and user communities are thereby central to innovation in the industry (Burger-Helmchen and Cohendet, 2011; Jeppesen, 2004). Through selective and partial openness in innovation processes, the firm can, to an extent, steer and manage the creation of this use-information by revealing aspects of current or future development work. It can also engage directly with users to attempt to influence or enable specific interactions with users to generate both broad and specific information about the preferences, use and needs of users. To do this effectively, however, the firm must create inroads or channels for this external information, and manage these. Purposive processes managing both the generation and internalization of information from user communities are important, given the sheer amount and embedded nature of much of this information.

Research examining the leveraging of external knowledge sources more broadly show that firms cannot feasibly utilize all external information relevant to its innovation processes, and a too-broad external search is instead detrimental to performance (Laursen and Salter, 2006; Salge, Farchi, Barrett and Dopson, 2013). It simply becomes too costly and difficult to manage. While leveraging user communities as sources of information in product innovation processes brings opportunities, it consequently also poses challenges for firms. In addition to resource restraints, these pertain in particular to identifying and internalizing sticky and embedded information about user needs and demand (Jeppesen, 2004), and enabling and managing significant amounts of this information. Video game firms have, as a result, developed specific capabilities to interact with and draw on user communities to enhance product innovation processes (Parmentier and Mangematin, 2014). While it has been identified that the industry is dependent on marketing and innovation related capabilities (Li et al., 2010), the type of, and underlying, processes of capabilities that allow video game firms to leverage users effectively and efficiently in DOI are under-researched. More broadly, extracting information about user needs and demand, internalizing and applying it in innovation processes are also key abilities of many firms, but has not been investigated to a satisfactory extent in extant research (Bogers et al., 2016). Examining and conceptualizing the capabilities of video game firms that enable this can thereby provide important insights for other contexts as well, where user communities constitute a potential source of innovation.

In addition to the need for theory development of DOI (Bogers et al., 2018; Nambisan et al., 2017), there is, as pointed out, also a need and opportunity to integrate and draw on analogous theory in OI (Randhawa et al., 2016). When examining the capabilities to leverage user communities, work on sensing in marketing and strategy research is particularly useful (e.g., Day, 1994; Mu, 2015; Teece, 2007). The potential of user communities as sources of innovation, in combination with the effectiveness of information transfer and DOI processes, makes the abilities to sense, identify and internalize external information critical. Such processes are central to video game firms, but have not been researched either in this type of industry or in user community contexts more broadly. Given the dissertation's aim to examine video game firms' capabilities to leverage user communities in DOI, adaptation and development of sensing capability concepts to this context is a promising endeavor. With this as a backdrop, the following research questions served as additional focuses to the research in this regard:

RQ1: How do video game firms utilize sensing capabilities to leverage user communities in product innovation?

RQ2: What are the performance outcomes of utilizing sensing capabilities to leverage user communities in product innovation?

The first question puts the focus on the processes and practices that constitute community sensing capabilities by emphasizing their use in product innovation. While a capability is typically regarded as a firm-level concept, its underlying or constituent processes and practices reside on the lower levels (Teece, 2007). Focusing on these lower levels places the analysis closer to where sensing processes occur. This aligns with recent attention of OI research on lower levels of analysis than the firm-level (Du et al., 2014; Salge et al., 2013; Thanasopon et al., 2016; Tranejekjer and Sondergaard, 2013; Vanhaverbeke et al., 2014) and the analytical perspective of this dissertation. The second question emphasizes a research interest not only in investigation and conceptualization of novel practices and their implementation, but also an investigation into their effects. Extant work on OI has often focused on the implementation and novel forms of innovation at the expense of analyzing effects and performance outcomes (Chesbrough et al., 2018).

Product openness

DOI also has important implications for openness at the product level. Digital technology impacts, in particular, products' potential for openness and platform characteristics that work as enablers in leveraging external innovation (Yoo et al., 2012). Digital innovations are, by definition, dynamic and malleable (Zittrain, 2006), and as a result have an inherent propensity to be partially open. The reprogrammability of software gives the digital product a potential to be continuously improved, adapted, extended and changed—not only by the innovating firm, but by external users as well. This property of digital products makes it possible for uncoordinated actors to independently develop innovations that are not substituting, but building on and complementing each other as modules and part of a platform (Magnusson and Pasche, 2014). It makes it easier to create products that are designed to leverage partial openness (West, 2003). As a characteristic of digital innovation, the firm can only attempt to limit or enhance this capacity but seldom avoid it completely. Even when firms try to block and restrict external innovation to retain control, users often find ways around these efforts through hacking and user modifications, where video game products constitute a case in point (Flowers, 2008). Essentially, the malleability, editability and transferability of the digital product make its boundaries permeable. These factors also mean that digital innovation is potentially never really completed. Instead, software code can be extended, features added and interfaces changed. As long as at least one actor innovates, either the firm or an external innovator, the innovation is never finished and the process never really stagnates (Parmentier and Mangematin, 2014).

Video game products are software and consequently display the dynamism and malleable properties of digital innovations. In addition to the common practice of firms in the industry to continuously develop existing

products throughout their life-cycle, user innovation movements in many user communities also use products as a form of innovation platform (Jeppesen, 2004; Koch and Bierbamer, 2016). From the firm's perspective, utilizing this and creating products with the characteristics of partially open innovation platforms allows a coupling of internal development with external innovation. This produces a potentially powerful complementarity between internal and external innovation, which has been seen as characteristic of OI with users in the video game industry (Burger-Helmchen and Cohendet, 2011; Koch and Bierbamer, 2016). The continuous innovation process of products after launch, occurring both internally to the firm and externally by users, provides a life-cycle flexibility (Buganza and Verganti, 2006) that capitalizes on the products' platform characteristics. Partially similar to the open source movement (e.g., Belenzon and Schankerman, 2015), the video game industry exemplifies how partially open digital products enhance the abilities of users to innovate. In fact, the platform characteristics of a product are a prerequisite for user innovation in this setting, and the better the fit between platform and innovator needs, the greater the value or user innovations (Jeppesen, 2004). As the outcomes of users' innovation processes are typically freely shared and digitally distributed to the wider user base (Koch and Bierbamer, 2016), product openness can provide an important source of external product innovation after product launch. To leverage it, the firm must, however, have the capabilities to design and create products that function as partially open platforms, and to manage them throughout their life-cycle.

What video game firms do in practice in this area can inform research on the management of DOI with user communities and help conceptualize such a product openness capability. Digital innovation has led to a surge of platform models as an increasingly important way for firms to innovate (Yoo et al., 2012). Platform strategies are not new to either practice or research (Kim and Kogut, 1996; Parker, Van Alstyne and Choudary, 2016; Thomas, Autio and Gann, 2014), but their centrality to digital innovation management increases with developments enabling openness, information transfer (Yoo et al., 2012) and design that allow the integration of external innovations (Cusumano and Gawer, 2002; Tiwana et al., 2010). Generally, the platform acts as a way for a multitude of actors to pursue innovation collectively, either independently or in collaboration (Gawer and Cusumano, 2014). The users who innovate based on these platforms become part of an ecosystem, and the firm developing the innovation platform takes up a position at its center (Gawer and Cusumano, 2014; Nambisan and Sawhney, 2011). The innovation platform itself is developed as long as it is used by the ecosystem actors and accrues value as network effects increase its scope, functions and usability (Gawer and Cusumano, 2014; Parker, Van Alstyne and Jiang, 2017).

While platforms have seen a surge in interest in both practice and research in recent years, theorizing in important areas is still lacking (Constantinides, Henfridsson and Parker, 2019; Nambisan et al., 2017). A significant research gap in the area of DOI relates to questions of how to design and create digital artifacts and platforms that enable value creation and capture from users (Chesbrough et al., 2018). Investigating product openness capabilities in the video game industry, their underpinning processes and performance implications, contribute to addressing this gap. It also aligns with the dissertation's aim to examine video game firms' capabilities to leverage user communities in DOI. For this type of capability to be effective, it needs to encompass both the creation and management of the platformed product through the continuous development and management of external user innovation. Based on this discussion, the following research questions also guided the research in this dissertation:

RQ3: How do video game firms utilize product openness capabilities to leverage user communities in product innovation?

RQ4: What are the performance outcomes of utilizing product openness capabilities to leverage user communities in product innovation?

Similar to RQ1, the third research question refers to processes constituting product openness capabilities. These are processes that allow, enable and utilize openness at the product level. This form of openness has primarily been seen as a value creation process, and its potential as a value capture mechanism has been scarcely examined in extant research (Koch and Bierbamer, 2016). The fourth question therefore adds a focus on examining the effects on the performance of applications of this type of capability.

Research approach

To answer these research questions, the dissertation compiles four papers dealing with the management of DOI with user communities. An overview of these in relation to the different research questions is given in Figure 1. Paper I presents a literature review of OI research at lower levels of analysis than the firm, aligning with arguments for lower-level perspectives in OI. For the research process, the review served to inform the direction and positioning of the empirical studies. This relates especially to the emphasis on lower-level perspectives of open and digital innovation processes adopted in Papers II–IV. Paper II draws on a qualitative case study of a video game firm particularly adept at utilizing user communities. The study examines sensing processes to identify and internalize information about user needs, demand and product use from user communities to inform and drive digital product

innovation. It also looks at the firm's product openness capability as an ability to design and manage products that, after launch, couple continuous internal development with external innovation by users. Based on the concepts in Paper II, Paper III looks quantitatively at video game firms' community sensing capabilities in addition to openness in products that facilitate external innovation by users after launch. Framed as two types of openness toward user communities, these are hypothesized to affect products' speed to market and financial performance. Inspired by partly mixed findings of the qualitative and quantitative studies in Papers II and III, Paper IV further examines the relationship between the community sensing capability and financial performance by hypothesizing and testing an indirect relationship mediated by the level of information the firm has about user needs, demand and product use.

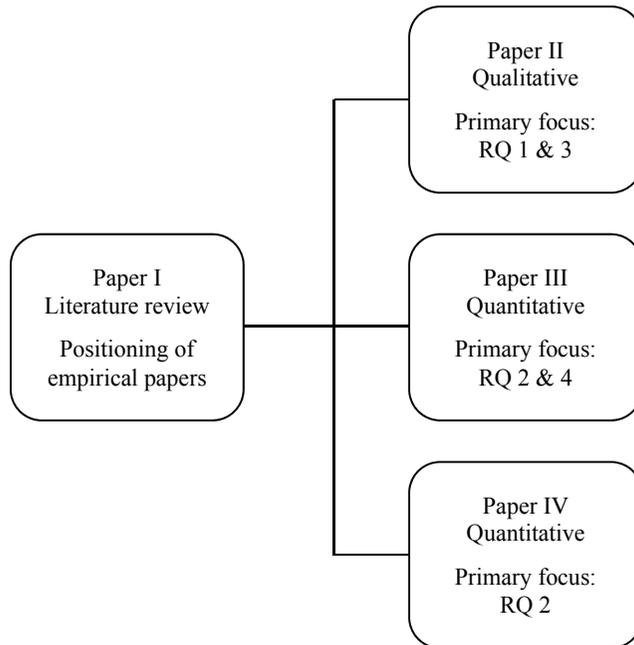


Figure 1. Overview of papers and research questions

Structure of dissertation summary

The structure of this summary is as follows. First, an outline of the theoretical perspective used in the empirical papers is presented in Chapter 2. These papers draw on a dynamic capability framework (e.g., Teece, 2007; Teece et al., 1997) to examine capabilities leveraging openness to user communities, and this chapter provides an overview of their theoretical foundations. The third chapter discusses the methods used in the dissertation and the different papers. Considerations and processes related to conducting the literature review, qualitative and quantitative data collection and analysis procedures are presented in this chapter. A summary of the papers constituting this dissertation is then given in Chapter 4. Concluding the dissertation summary is an overview of the main findings and conclusions in Chapter 5. This last chapter revisits the aim and research questions of the dissertation, offers concluding remarks on the research done and highlights implications of the findings.

2. A capability perspective of DOI

Digitalization and the increasing integration of digital innovation into firms' activities have made OI strategies and business models more promising as well as more common (Chesbrough and Bogers, 2014:16). In many industries, digital technology and digitalization have created environments that reward porous firm boundaries and increase the efficiency and ease with which diverse actors interact and exchange information. The changes to competitive landscapes brought by digital and increasingly distributed innovation processes, however, also drive shorter product life-cycles at the same time as product complexity increases (Teece and Linden, 2017). While these conditions result in rapidly changing and dynamic market conditions, they also increase the potential of capabilities to leverage DOI in the development of the firm's offering.

As open and digital innovation processes are becoming more common, innovation by and together with users and consumers is also increasingly prevalent across sectors (Baldwin and von Hippel, 2011). In the video game industry, user involvement is common in product development and important to product innovation processes (Arakji and Lang, 2007; Burger-Helmchen and Cohendet, 2011; Hau and Kim, 2011; Koch and Bierbamer, 2016). In this context, product features are highly dependent on digital technology, where considerable developments are made in a few years' time, constantly increasing the possible scope and complexity of products. The distinct technical, artistic and design components of product development also allow a modularization of innovation processes. This, in combination with the digital nature of innovation in this industry, facilitates both the use and the rewards of inbound information flows, involving users as ideators, testers and innovators in product development (Haefliger, Jäger and von Krogh, 2010; Jeppesen, 2005; Jeppesen and Molin, 2003; Readman and Grantham, 2006; Schulz and Wagner, 2008; Tschang, 2007). The digital properties of products enable games to be open-ended and continuously developed after they have been brought to market, both by the firm and by users (Flowers, 2008; Koch and Bierbamer, 2016). By creating additional content, firms effectively market products that are under constant development and improvement. Complementing these internal processes are user innovations that add to, modify, extend or alter products after launch.

To manage these processes, video game firms draw on specific dynamic capabilities that allow them to tap external information and combine internal

and external development to continuously adapt products to the changing and developing needs and demand of users. In this chapter, the theoretical lens used in this dissertation to conceptualize these capabilities is outlined. It begins by briefly describing the dynamic capability framework which is used as a starting point and overarching perspective. This is followed by an elaboration of the community sensing and product openness capability concepts, which are central focal points in the empirical Papers (II–IV).

Dynamic capabilities

The dynamic capability perspective is commonly seen as a development of the resource-based view (RBV) of the firm (Schilke et al., 2018). RBV emphasizes the firm's heterogeneous resources and competences as the main source of competitive advantage. From this perspective, the firm is seen as a bundle of resources (Penrose, 1959), and its efforts are to develop largely firm-specific core competences from these resources to drive performance (Barney, 1991). This has traditionally entailed a focus on current and internal resources and how to most effectively employ them (Schilke et al., 2018). The dynamic capabilities perspective, in contrast, stresses the need for the firm to be able to purposively change and adapt the resources and competences it draws on to compete. This view developed from a realization of how increasingly fast-moving and dynamic environments force firms to co-evolve with their environments, and it contrasts with the RBV in its implicitly more static perspective. It also differs from traditional strategic perspectives emphasizing competitive positioning vis-à-vis other market actors (e.g., Porter, 1979) over change and adaptation as drivers of performance. In dynamic capability literatures, performance is seen to stem from the exploitation of both internal and external resources and knowledge (Helfat and Winter, 2011; Teece, 2007; Teece et al., 1997). The term *dynamic* refers to the renewing and recombining of resources and competences over time to adapt and act on change and opportunity in the firm's environment (Teece et al., 1997). Importantly, dynamic capabilities differ from operational or ordinary capabilities (Winter, 2003). Operational capabilities are those that allow firms to make a living using largely the same means and similar offerings catering to the same needs and demand as they traditionally have done. Both dynamic and operational capabilities are collections of processes and routines (Helfat and Winter, 2011; Winter 2003), but dynamic capabilities enable the change of products, development processes and innovation of offerings, and how customers are served (Pavlou and El Sawy, 2011; Winter, 2003).

Another important characteristic of dynamic capabilities is that they are constructed and emergent rather than easily bought or transferred, making them, to an extent, idiosyncratic and firm-specific (Teece et al., 1997), alt-

though with elements of generalizability (Eisenhardt and Martin, 2000). Idiosyncratic details and generalizable capabilities are not inconsistent (Baretto, 2010), as this only entails that there are different means to achieve the same capability. Underlying practices may differ in both form and importance between industry settings and between firms as dynamic capabilities are embedded in organizations (Helfat and Martin, 2015). As such, dynamic capabilities can be “idiosyncratic in their details” (Eisenhart and Martin, 2000:1108), but made up of processes that are comparable between firms and settings. In smaller, compared to established firms, for example, constituent processes may take different forms and vary in scope, degree and complexity (Zahra et al., 2006). Dynamic capabilities are nonetheless important for innovation in small and medium sized firms (SMEs) (Arend, 2014; Borch and Madsen, 2007; Corner and Wu, 2012), in particular for smaller firms in digital and software-dominated industries (Mathiassen and Vainio, 2007).

In an OI context, there is a natural emphasis on the role of dynamic capabilities to internalize and recombine external knowledge resources with internal ones to create value, although this has always been an explicit part of the dynamic capability perspective (e.g., Teece et al., 1997). For this reason, the dynamic capability view has been an important perspective in OI research (Randhawa et al., 2016; West et al., 2014). For this dissertation, it provides a lens and tool to conceptualize the abilities of video game firms to manage and leverage openness to user communities enabled and facilitated by digital technology in product innovation and development. The perspective displays good fit to the research topic of DOI, as it is primarily concerned with how firms drive performance in dynamic contexts through the exploitation of internal and external resources and sources of innovation (Makadok, 2001; Teece et al., 1997; Zollo and Winter, 2002). Both the community sensing and product openness capabilities are dynamic capabilities, as they allow the utilization and reconfiguration of internal and external resources in product innovation to develop products in relation to changing conditions. As has been mentioned, product innovation does not necessarily end with the launch of products in this setting. In fact, it is a common characteristic of video game products that a significant part of the innovation process occurs after they have been marketed (Jeppesen, 2004; Koch and Bierbamer, 2016). The nature of video games as digital products (Zittrain, 2006) and development work as digital innovation (Yoo et al., 2010) thereby emphasizes the dynamic aspect of these capabilities further as they enable development occurring continuously throughout the products’ life-cycles (Koch and Bierbamer, 2016). This also makes this perspective different from new product development (NPD) frameworks and stage-gate models (e.g., Cooper, 2009) with clearly demarcated phases and end-stages of development.

Dynamic capabilities have an overall positive relation to performance (Pezeshkan et al., 2015), but extant research has had differing views on the nature of this relationship and whether it is mainly direct or indirect (Schilke et al., 2018). In addition, different firms with similar dynamic capabilities may see different performance outcomes (Zott, 2003), and different firms will have different degrees or levels of a dynamic capability (Baretto, 2010). As the focus in this dissertation is on openness of processes and individual products, it is the application of dynamic capabilities to manage and leverage openness that is of interest in relation to performance. A view where simply having a dynamic capability does not impact outcomes is adopted, and instead it is only in its mobilization and utilization that performance is affected (Eisenhardt and Martin, 2000). Furthermore, the application of a dynamic capability is also assumed to be a matter of degree. A firm may possess a certain dynamic capability, yet only apply it to its full extent in some situations but not others, depending on strategic priority, the availability of resources and the requirements of the particular setting.

Dynamic capabilities are firm-level concepts, but their microfoundations are processes residing on lower levels than the firm (Teece, 2007; Wilden, Devinney and Dowling, 2016). As product innovation typically occurs in development projects (Hobday, 2000; Sydow et al., 2004), the microfoundations of capabilities managing product innovation will therefore primarily reside at this level. The empirical and analytical work in this dissertation is therefore on the application of dynamic capabilities to manage DOI with user communities in product development projects¹. Focusing on the microfoundations of dynamic capabilities is not new, and research has examined processes at the individual (Adner and Helfat, 2003; Helfat and Peteraf, 2015), team and group (Friedman, Carmeli and Tischler, 2016; Wilden, Devinney and Dowling 2016), and business unit levels (Pavlou and El Sawy, 2011). Neither is putting focus on the use or application, rather than the existence, of a capability new (e.g., Wilden and Gudergan, 2015), but it is useful to identify heterogeneity and effects of openness at lower levels (Du et al., 2014; Salge et al., 2013; Thanasopon et al., 2016). In conclusion, it is assumed that there exists heterogeneity in the level or intensity of capabilities among firms and in the degree of application between and within firms. As a consequence, it is useful, if not necessary, to examine the dynamic capabilities' application and outcomes at the level where they occur in order to meaningfully examine and measure their effects.

¹ The terms product development projects and product innovation projects are used interchangeably. A project in this context is seen as a temporary entity that bracket a set of interrelated and potentially complex activities and processes (Du et al., 2014) that are nested within organizations (Sydow et al., 2004). As product innovation can occur throughout a product's life-cycle in the video game industry, product development or innovation projects do not necessarily end at launch.

Classes of capabilities

Dynamic capabilities can further be categorized into classes of capabilities (Teece, 2007) where two types are especially relevant for leveraging user communities in DOI at the project level. These are capabilities to sense opportunities and value creation, and capabilities developed to seize identified and emergent opportunities and capture value (Teece, 2007). Sensing and seizing capabilities are important for the innovation performance of all firms in dynamic environments. In the introduction chapter, DOI with user communities was outlined as an area requiring specific capabilities to be managed effectively. In this dissertation, community sensing and product openness capabilities are examined as two capabilities geared specifically toward this. Community sensing is seen as a form of sensing dynamic capability, while product openness capabilities are related to value capture and seizing opportunities for internal and external product innovation. The outcome of the application of these types of capabilities has similarities to the exploration and exploitation concepts of March (1991). Effectively sensing opportunities for product innovation entails searching and exploring new developments and market trajectories. The community sensing capability is seen primarily as a way for the firm to identify and internalize externally located information that is conducive to innovation. To seize opportunities to develop the firm's offering, the firm, in turn, needs the capabilities to exploit developments and market information. The product openness capability allows the firm to couple internal and external innovation and to develop the firm's product continuously and over time. Sensing and seizing capabilities are distinct but interrelated, and successful firms are able to develop and apply both simultaneously, but through separate processes (Teece, 2007). In the empirical work of this dissertation, these capabilities were hypothesized to affect the financial performance of products and their development in terms of development speed. These are both important outcome variables of product innovation in the video game industry as many firms rely heavily on a few successful products and the dynamic context make timely developments imperative. The two capability concepts were conceptualized as interlinked, given earlier conceptualizations of sensing and seizing capabilities' synergistic value creation and capture mechanisms (e.g. Teece, 2007). The initial conceptual model guiding this work is presented in Figure 2. The theoretical underpinnings of these two concepts are outlined in the following sections. An overview of the capability concepts and their definitions, role, underpinning processes and grounding extant work are given in Table 1.

Table 1. Summary of focal concepts

Dynamic capability	Definition	Type of openness	Role of capability	Constituting processes	Exemplary prior work
Community sensing	The firm's ability to identify and internalize innovation-conducive information from user communities.	Innovation process	Sensing emergent opportunities for product innovation. Value creation.	Proximity & ties to community. Enabling & facilitating inbound information flows.	Sensing capabilities: Day (1994) Teece (2007) Video game industry: Burger-Helmchen and Cohendet (2011); Jeppesen (2004); Parmentier and Mangematin (2014)
Product openness	The firm's ability to create and manage products functioning as platforms for continuous development and coupling of internal and external innovation.	Product	Seizing emergent opportunities and capturing value from internal and external product innovation.	Internal continuous innovation. External continuous innovation.	Seizing capabilities: Teece (2007) Video game industry: Koch and Bierbamer (2016); Parmentier and Gandia (2013) Innovation platforms: Gawer and Cusumano (2002); Meyer, Ostevskyy, Livaers and van Hugten (2017)

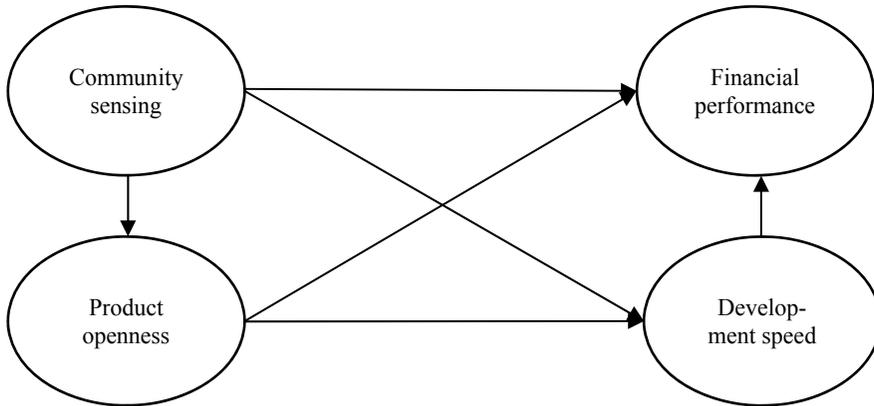


Figure 2. Conceptual model guiding the empirical research

Conceptualizing community sensing capabilities

Sensing capabilities conceptualize abilities to identify and act on emergent change and opportunities through scanning, interpreting, internalizing and shaping processes (Teece, 2007). These capabilities direct the development of new and established products, as well as identify changing and emerging market needs and processes to tap and leverage OI (Teece, 2007; Teece and Linden, 2017). In the context of product innovation, sensing entails developing ways and processes aiming to ensure that internal development comprehends and quickly adapts to market needs and changes, in addition to being able to shape and influence them (Pavlou and El Sawy, 2011). Purposive inbound OI practices (Gassman and Enkel, 2004) that leverage information flows from external actors are examples of sensing processes. Sensing capabilities have been examined both in strategy (e.g., Teece, 2007) and marketing literatures (e.g., Day, 1994; Foley and Fahy, 2009). In the latter, the research has focused on market sensing capabilities that identify and internalize information from external market sources to define unexploited market opportunities. A sensing capability is constituted by purposive and systematic processes to identify and internalize information from sources in the firm's ecosystem (Day, 1994; Mu, 2015; Olavarietta and Friedmann, 2008; Teece, 2007) and is inherently linked to product innovation (Mu, 2015). Effective sensing capabilities thereby allow the firm to realize and act on these opportunities before the competition has the chance to do so (Day, 1994) by identifying and internalizing information about unarticulated needs and latent demand (Du and Kamakura, 2012; Foley and Fahy, 2004, 2009; Teece, 2007).

While related as an important facilitator of OI, sensing capabilities are different from the concept of absorptive capacity, defined as "the ability to recognize the value of new information, assimilate it and apply it to com-

mercial ends” (Cohen and Levinthal, 1990:128). Sensing and absorptive capacity are distinct dynamic capabilities, as sensing primarily focuses on generating and gathering market information, while absorptive capacities focus on obtaining and creating new knowledge often implied to be of a technological nature (Hurley and Hult, 1998; Pavlou and El Sawy, 2011). This implies a distinction in the information/knowledge artifact resulting from the two capabilities, where the former is more related to information about needs, demand and product use and the latter technological know-how. Put differently, whereas sensing is about finding out *what* to do in innovation processes, absorptive capacity is more focused on assimilating the knowledge required to do it. Absorptive capacity, as outlined by Cohen and Levinthal (1990), also has a more prominent role as a learning capability that combines externally acquired knowledge with internal R&D and manufacturing practices. Sensing, in contrast, is made up from processes to identify needs, being responsive to shifting conditions and identifying opportunities (Day 1994; Pavlou and El Sawy, 2011; Teece, 2007). Both concepts have seen broad application and uses, and there is, for that reason, likely to be a certain degree of conceptual overlap despite these differences. This is especially true when considering the multidimensional definitions of absorptive capacity (e.g., Zahra and George, 2002), where the acquisition and assimilation dimensions hold certain similarities to sensing capabilities.

Sensing capabilities encompass a class of dynamic capabilities to identify and internalize information that can serve to define opportunities for innovation and development. In the video game industry, user communities constitute a potent source of such information. These user communities contain information about users’ preferences, needs and demand that is useful for the firm’s internal development and product innovation. This use-information is conducive to product innovation (Hau and Kim, 2011), as an active user community holds more up-to-date and extensive information than what the firm can generate on its own (Jeppesen, 2004). It is located partly with individual lead- and advanced users, but is, to a significant extent, also generated in networks and interactions between users (Füller et al., 2007; Jeppesen, 2004; Jeppesen and Laursen, 2009). In these interactions, users share information and support each other in using products and in user innovation efforts (Franke and Shah, 2003; Jeppesen, 2005). The importance of monitoring, engaging in and encouraging interactions to generate and make use-information visible have made capabilities that allow interactions with communities pivotal (Dahlander and Magnusson, 2005; Parmentier and Mangematin, 2014). In order to leverage sensing processes in user community contexts and internalize information useful for product innovation, the firm needs to be able to manage interactions with individual users as well as larger groups and crowds.

Users are commonly intrinsically motivated to share information and innovate (Schulz and Wagner, 2008; Wiertz and de Ruyter, 2007), and as a

result, the role of the firm is primarily to facilitate community activity, navigate community settings and develop processes to identify and internalize relevant information. Due to the characteristics of user community settings, this is not necessarily straightforward or easy. User communities are made up of complex networks and social structures of internationally dispersed users with different demographics and interests (Cova and Pace, 2006; Dahlander and Frederiksen, 2012; Dahlander and Wallin, 2006; Ganley and Lampe, 2009; Malinen, 2015). They congregate because of product-use and shared interests, but individuals and groups of users have different knowledge levels, skills and characteristics. This makes them heterogeneously motivated and able to engage in different types of activities and interactions. Previous research on video game communities has identified broad sub-communities of users capturing the users' diverging interests, knowledge, skills and capacity to contribute to different parts of product innovation (Burger-Helmchen and Cohendet, 2011; Plant, 2004; Schulz and Wagner, 2008). Users differ in their orientation toward gaming or the technical aspects of games, which will make them better equipped and motivated to contribute to use-related, creative or technical aspects of development (Burger-Helmchen and Cohendet, 2011). Certain users are more inclined and have more specialized knowledge in areas relating to the testing of features and systems, while others are more interested in developing content, creating tools or supporting other users. These similarities bring users together into relatively focused sub-communities. To leverage them in DOI, the firm must be sensitized to these nuances and be able to navigate, interact with and internalize information from different parts of the community.

For community sensing to be relevant in individual development processes, the firm must also develop channels or inroads for this information that feeds into product development. Extant research on the video game industry highlights ideation processes, ways of eliciting feedback on past development, and the involvement of users in testing and content creation during development as practices that perform such functions (Jeppesen and Molin, 2003; Nambisan and Baron, 2007; Parmentier and Mangematin, 2014). Such processes can to some extent be seen as ordinary capabilities (Winter, 2003) in the video game industry, but identifying and internalizing innovation-conducive information from them requires an effective sensing capability. In this way, the community sensing capability can be seen as acting on these ordinary capabilities. Previous research has also highlighted the importance for this type of firm to develop close ties with communities to leverage them successfully (Parmentier and Mangematin, 2014). Utilizing sensing processes effectively and efficiently in user community contexts is thereby also facilitated by a close proximity between the firm, development processes and the user community. Given the embedded and difficult-to-transfer nature of the information contained in user communities, this proximity and ability to develop ties is beneficial for inbound information flows.

Taken together, a community sensing capability conceptualizes how the firm manages openness in product development processes to user communities that results in the internalization of innovation-conducive information from users. Drawing on previous research on sensing capabilities (Day, 1994; Teece, 2007), community sensing is defined as the firm's ability to identify and internalize innovation-conducive information from user communities. The capability is tightly related to the identification and defining of opportunities for innovation through the internalizing of this information. This is not explicitly included in the definition, however, to avoid the tautology trap related to defining a dynamic capability in terms of its performance outcome (Priem and Butler, 2001; Zollo and Winter, 2002).

Conceptualizing product openness capabilities

While a community sensing capability provides the firm with a mechanism to anticipate actable opportunities for product innovation, exploiting these opportunities requires different capabilities, however. These are capabilities that capture value and seize opportunities identified and initially defined by sensing processes. This class of capabilities is distinct from, but interrelated with, sensing capabilities. Capabilities to seize and capture value materialize through the firm's development of new and existing products, but also the management of product boundaries and external sources of innovation (Teece, 2007). Their microfoundational processes center around defining and implementing value capture mechanisms through the design of market offerings, in addition to product and technology architectures (Teece, 2007). This includes internal development work with new products, as well as the management and utilization of external innovation through practices and processes that facilitate external complementary innovation.

In the video game industry, firms have capitalized on strong user innovation movements in user communities by coupling internal innovation and product development with complementary innovations from user communities. User communities constitute sources of product innovation (Koch and Bierbamer, 2016; Piller and Walcher, 2006; Postigo, 2007), and openness in products is a prerequisite for user innovation in the video game industry (Jeppesen, 2004). Through abilities to design partially open products, video game firms are able to create games that function as innovation platforms enabling development by both the firm and users. This is a continuous development that builds on already-marketed products that are further developed, modified and added to throughout their life-cycles. The product openness capability essentially enables the firm to integrate external innovation with internal development and to adapt and develop the firm's offering to changing and emergent market dynamics. Routinized and enduring processes that permit the creation and management of partially open products function-

ing as innovation platforms thereby constitute a form of seizing dynamic capability.

The prevalence of platform concepts has increased in management research (Thomas et al., 2014) as digital and open innovation make utilization of innovation platforms more effective and relevant (Chesbrough, 2003; Teece, 2017; Teece and Lindon, 2017). Video game firms purposively utilize products as platforms functioning, in part, similarly to product-family platforms where systems and functionality are shared between versions of the product (Meyer et al., 2017). The continuous development by the firm draws on its core systems and functionality to produce new and adapted content to users. As video games are digital products, their dynamic and malleable characteristics (Zittrain, 2006) enable this development which adapts them to changing market conditions and identified opportunities (Tschang, 2007). A released game is a complete product in itself but can still be extended and updated throughout its life-cycle, and the innovation process is, in this sense, never finalized (Parmentier and Mangematin, 2014). This lends the firm a flexibility in development and product innovation (Buganza and Verganti, 2006) where the firm develops expansions and updates software and additional content that is either free or sold to users of the original game (Jeppesen, 2004).

Video games designed to leverage user innovation also share characteristics with platforms that support ecosystems of external and complementary innovation (Gawer and Cusumano, 2002). In addition to the internal development by the firm to extend and adapt products, the platform characteristics of products also enable user innovation (Haefliger, Jäger and von Krogh, 2010; Jeppesen, 2004; Koch and Bierbamer, 2016; Schulz and Wagner, 2008). User innovations in the video game industry are predominantly based on existing products (Koch and Bierbamer, 2016) and add value to the product by adapting it to specific user needs (Boudreau and Lakhani, 2009). User communities have advantages over both the firm and individual users in defining user needs (Jeppesen, 2004). The often specialized and modular innovations that result from user innovation processes thereby offer complementarity to the firm's development, which typically addresses the needs of broader user groups (Arakji and Lang, 2007; Parmentier and Gandia, 2013). These user innovations are not necessarily authorized by the firm (Flowers, 2008) but add functionality or features to the product (Jeppesen, 2004). Many games have, however, built-in or separate editor software or tools aimed at enabling and facilitating user innovation (Jeppesen, 2005; Parmentier and Gandia, 2013). Such efforts are significant, as the better the platforming functionality the open product offers to users, the greater the propensity the user innovations have to add value to the product (Jeppesen, 2004). But by developing products that function as partially open platforms, the firm shifts part of the locus, as well as control, of the innovation to user communities (Jeppesen, 2004). As a result, video games are, as a rule, not

completely open. Degrees of openness and selective revealing instead serve as a way to trade control over part of development for diversity of innovation (Boudreau, 2010). This management of products' degrees of openness is an important part of a firm's product openness capability.

In sum, this type of platform allows the development of additions and modular innovations based on the systems of the original product (Meyer et al., 2017) in addition to the management of the ecosystems of external innovators (Boudreau and Lakhani, 2009; Thomas et al., 2014). In this sense, the platform can be thought of as an extensible base enabling a shared functionality to the innovations and additions developed both by the firm and external innovators (Tiwana et al., 2010). It is, however, different from what have been termed organizational innovation platforms and platforms functioning as market intermediaries (Thomas et al., 2014).

The ability of the firm to create and manage products functioning as platforms for the continuous development and coupling of internal and external innovation constitutes its product openness capability. The effects of this type of capability to leverage external innovation in user communities based on platformed products have scarcely been examined empirically (Koch and Bierbamer, 2016). More broadly, the evidence of involving users in digital product innovation is mixed. Previous research has indicated that involving users may increase overhead costs at the product level (Jeppesen, 2005). There are, however, also indications of impacts on development speed (Fang, 2008; Knudsen and Mortensen, 2011) and positive effects on performance (Arakji and Lang, 2007; Parmentier and Gandia, 2013; Parmentier and Mangematin, 2014) and the longevity of products (Jeppesen, 2004). But taken together, product openness as a way to leverage DOI with user communities has not received enough attention or been conceptualized as a dynamic capability.

The two dynamic capabilities conceptualize distinct but interrelated abilities of firms which enable leveraging openness to user communities in product innovation. Sensing capabilities are particularly valuable during the early stages and further development of platforms (Teece, 2017) by informing design and development decisions related to market needs and value propositions (Dong, Garbuio and Lovallo, 2016). Sensing can thereby help identify and define the boundaries of the innovation platform functionality of products, its characteristics and degree of openness. The product openness capability is, in turn, needed for its creation, implementation and management. With the theoretical concepts outlined, the following chapter of this dissertation summary focuses on the methods used in the papers constituting this dissertation.

3. Methods

This chapter provides an overview of the rationale of the different methodological approaches, followed by a more in-depth description of the work conducted using each method. This dissertation employs a sequential mixed methods approach (Teddlie and Yu, 2007) in order to answer to its overarching aim and research questions. In addition to empirical investigations in Papers II through IV, the dissertation also draws on a review of extant literature of OI at micro-levels, presented in Paper I. Literature reviews aid in mapping and assessing previous research in addition to position and focus research projects (Tranfield, Denyer and Smart, 2003). For the dissertation, the review helped to frame the empirical research relative to extant research. It also aided and supported the construction and design of the empirical investigations as well the interpretation of their results. In terms of empirical methods, the research process sequentially progressed from using qualitative methods with a predominantly explorative focus to quantitative methods with a stronger emphasis on testing relationships between variables. A summary of the methods and data sources used is given in Table 2. This design allowed for benefiting from the strengths and mitigating the weaknesses commonly associated with both qualitative and quantitative methods (Tashakkori and Teddlie, 1998). Qualitative data is characterized by a close proximity to the specific situation, process or object under study. This provides a richness and contextualization that facilitates revealing complexity in addition to latent and underlying processes (Miles and Huberman, 1994:10). Qualitative methods are thereby particularly suitable for the exploration and examination of novel areas and aid in the development of hypotheses. In Paper II, the dissertation employs a qualitative case study, a qualitative approach focusing on understanding dynamic processes in bounded settings (Eisenhardt, 1989). Case studies are especially useful for novel areas and instances where the existing theory is lacking in some regard or aspect (Eisenhardt, 1989; Eisenhardt and Greabner, 2007). Case research thereby provides the dissertation with important theory and concept development tools. While these are useful and necessary for the research process, case studies and qualitative data also have some inherent weaknesses. These relate in particular to the subjective interpretation of data, lack of transparency in analysis and limited statistical generalizability (Bryman and Bell, 2007:408). Although attempts are made to limit these by drawing on systematic and transparent qualitative analysis procedures (Gioia, Corley and Hamilton,

2012), quantitative methods offer important complementarities and stronger tools for testing theoretical conjectures. By focusing on quantification in data collection and analysis, these methods excel at testing the structure and relationships between concepts as outlined by theory. Quantitative designs are typically characterized by the systematic measurement and analysis of data and the testing of formal hypotheses grounded in theory. This type of research strives to make inferences from samples of data to a larger population, and is thereby better geared toward statistical generalizability than are qualitative methods. Quantitative analysis is also considered to be able to demonstrate stronger arguments for generalizable causality, in addition to displaying a greater capacity for the replication of findings (Bryman and Bell, 2007:163-5). Quantitative methods, however, sacrifice the contextual richness and grounding of data available to case research, and thereby run a risk of imposing an overly mechanistic perspective on social processes (Bryman and Bell, 2007:169-70). In Papers III and IV, quantitative data and analysis are used to test hypothesized relationships between central concepts grounded both in established research and the theory-developing work of the case study. Taken together, the dissertation’s methods are intended to provide synergy and complementarity by drawing on different perspectives and tools suitable for different stages of the research process. The following sections provide overviews of these three methods.

Table 2. Summary of methods and data sources

Type of data	Collection method	Analysis method	Number
Academic articles	Structured literature review	Narrative review	97
Qualitative	Semi-structured interviews	Gioia method (Gioia, Corley and Hamilton, 2012)	22
Quantitative data	Survey, structured interview	SEM with LISREL	151

Literature review method

The early stages of the research process behind this dissertation were characterized by a primary focus on the empirical phenomenon and the characteristics of the research context. The novelty of practices and processes in the video game industry relative to traditional industries meant that several perspectives and theoretical lenses were both applicable and promising in terms of the contributions to extant research. This is also evident in the larger research project with senior colleagues at Uppsala University, of which this dissertation is a part. Here, international business, marketing and innovation management perspectives coalesced into what became an initial interdisci-

plinary perspective of the phenomenon and research context. This generated a palette of possible perspectives of the phenomenon that were interesting and promising. Discussions, common ground and diverging research interests at this early stage eventually led to a crystallization and identification of the focus adopted in this dissertation. This was the focus on processes related to the management of DOI, which was seen as an area in which the research could make a contribution. At this stage, the review served as a way to concretize the research focus of the dissertation toward OI, not as a choice of theory but in terms of direction. OI is not a unified theory or perspective, but a field of research that comprises a range of topics dealing with the management of distributed innovation. As has already been mentioned, OI is inherently a firm-level concept (West and Bogers, 2014), while innovation processes often occur at lower levels (Haas 2010; Hobday, 2000; Shenhar and Dvir, 2007; Sydow et al., 2004). The review therefore focused on extant research on micro-levels in OI. Arguments for the importance of these levels have been articulated (Chesbrough and Bogers, 2014; Du et al., 2014; Felin and Zenger, 2014; Schroll and Mild, 2012), but there exists no overview taking stock of the work done at these levels.

Search method

As a field, OI has expanded rapidly since the advent of the term and its popularization through Chesbrough (2003). As a result, it has been the subject of several review efforts adopting different perspectives (e.g., Bogers et al., 2016; Dahlander and Gann, 2010; Elmquist, Fredberg and Olilla, 2009; Gassman, Enkel and Chesbrough, 2010; Huizingh, 2011; Remneland Wikhamn and Wikhamn, 2013; West et al., 2014). The review method used in Paper I was influenced by these earlier papers but adapted to the aim of this particular paper and the requirements of a micro-perspective of the field. An overview of the steps taken in the search, analysis and review procedure is outlined in Figure 3, which is also available in Paper I. First, a delimitation was made to focus the search of literature to the core, or what could be considered the mainstream, of OI. To this end, the review followed the work of West and Bogers (2014) and selected for review only work published in central innovation journals. While this entails a necessary exclusion of many studies published in other outlets, it also provides a clearer and arguably more coherent picture of the state and direction of the field. Second, the selection of search terms was done in line with Randhawa et al. (2016), who developed a list of key concepts in OI. The terms “open innovation,” “openness,” “crowdsourcing” and “co-creation” were consequently used to search for studies dealing with central OI topics. This, rather than only relying on “open innovation” as a search term, was intended to avoid excluding papers that deal with OI topics while not explicitly mentioning the term in the title, keywords or abstract. The combination of what may be considered a con-

servative body of journals and a broader set of search terms offered complementarity in terms of capturing the core of the field, but with a wider range of relevant phenomena. The search included only studies published in 2003 or later, as this was the year when the publication of Chesbrough (2003) established the term “open innovation” as it is used in most research today. This is consistent with previous reviews (e.g., Schroll and Mild, 2012). The search was conducted during the spring of 2017 and, in total, resulted in 494 articles that included one or several of the search terms in title, keywords or abstract. The search procedure was done using the Scopus database, following previous reviews (e.g., Randhawa et al., 2016; West et al., 2014).

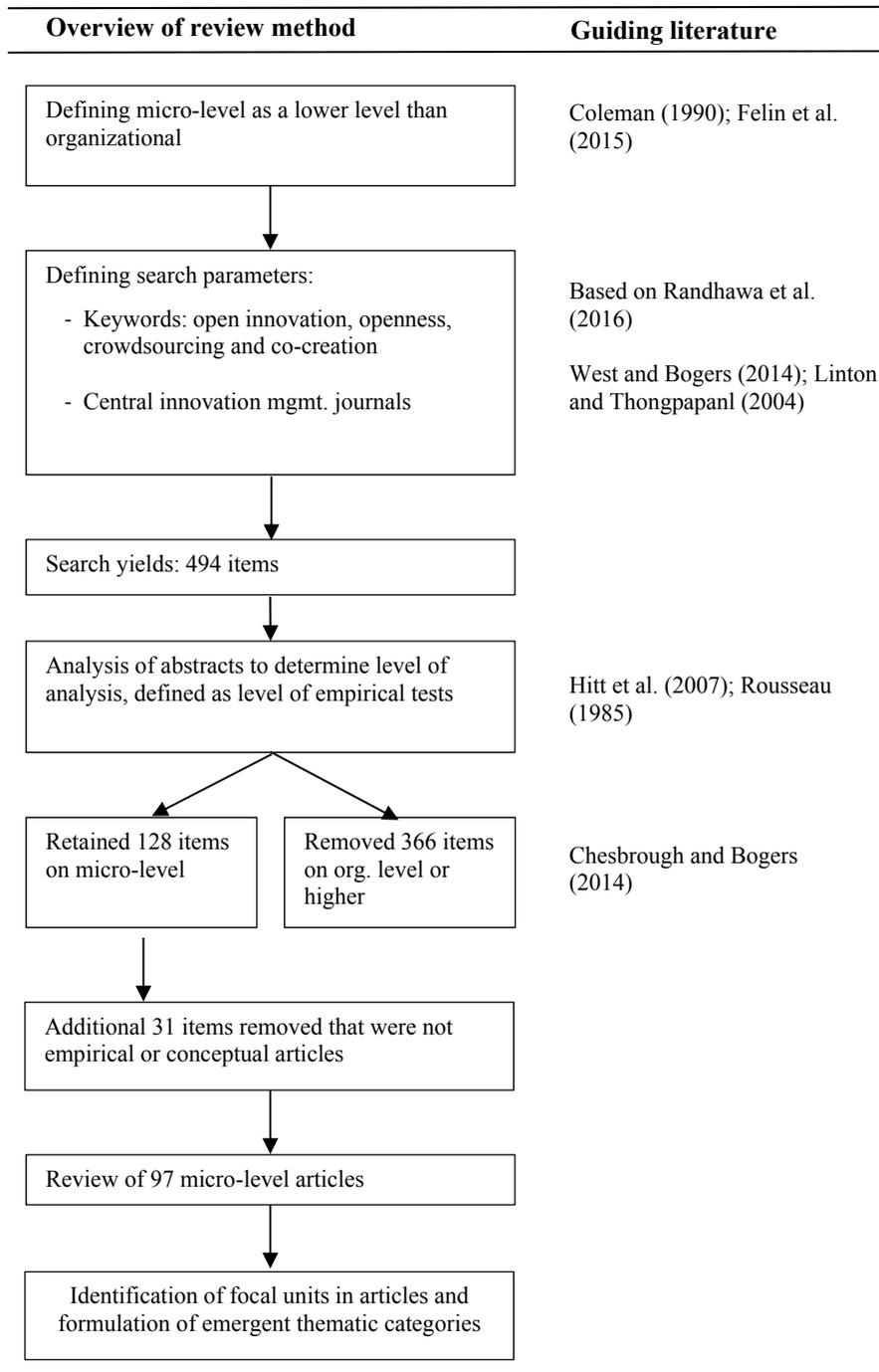


Figure 3. Literature review procedure

Analysis and review procedure

Although the review focused on micro-level research, this was not explicitly operationalized or incorporated in the search procedure. The reason for this was that studies analyzing processes at lower levels do not always state this in their titles, keywords or abstracts, or they use different terms to describe their focus. Requiring terms such as “micro” or “microfoundation” to be present would have restricted the number of studies considerably and unnecessarily to studies with explicit references to such concepts. OI research, and in particular studies conducted in the early years of the field, emphasize novel, empirically driven research and case studies with high managerial and practitioner relevance (Van de Vrande, Vanhaverbeke and Gassman, 2010). While some of this research is on micro-levels, authors typically do not highlight this. Instead, the review identified micro-level studies by analyzing abstracts, and when necessary the complete articles to determine the level of analysis of each paper. This was done by adopting the framework of Chesbrough and Bogers (2014) that conceptualized five distinct levels of analysis relevant to OI research. In the terminology of this framework, extra-organizational, inter-organizational and industry perspectives categorize higher levels of analysis relative to the organizational level. Micro-levels are, in turn, defined as those situated at a lower level than the organizational. While this definition differs from perspectives that equate microfoundations and micro-levels with the examinations of individuals (Coleman, 1990; Felin, Foss and Ployhardt, 2015), this more pragmatic view treats levels of analysis as a matter of perspective (Hitt, Beamish, Jackson and Mathieu, 2007). This allows for the existence of several micro-levels, for example individuals or projects, depending on the questions posed and the analytical perspective that is adopted. In order to practically categorize papers according to this logic, a level of analysis was operationalized as the level of focal unit and empirical tests, following conceptual work on multi-level research in management (e.g., Hitt et al., 2007; Rousseau, 1985). This step of the process divided the 494 papers into two groups, one adopting organizational or higher-level perspectives and one consisting of research on lower, i.e., micro-levels. This resulted in 366 items in the first group and 128 in the latter. From these 128 micro-level articles, 31 were removed that were not conceptual or empirical articles on OI topics, i.e., reviews, commentaries, book excerpts or retracted articles. This last step produced a final set of 97 articles dealing with micro-level subjects in OI.

These were subject to a full review of topics, main methods, focal units and findings. A key part of this process was to formulate and conceptualize emergent groups within this body of works. In a first step, this resulted in a broad grouping based on focal units that split the sample of studies into project level ($n = 59$) and individual level studies ($n = 38$). Second, by analyzing the topic of the phenomenon being investigated in each paper, thematic cate-

gories were formulated into which articles were ordered. An overview of this two-layered categorization of focal units and thematic categories is given in Table 3 and also present in Paper I.

Table 3. Categorization of paper in literature review

Focal unit	Thematic category	Number of studies
Projects		59
	Product and service development in OI	20
	Co-creation & user collaboration	3
	Open collaborations and relationships	8
	Knowledge and intellectual property (IP) management.	5
	Crowdsourcing	23
Individuals		38
	Attitudes	5
	Motivations	13
	Roles	8
	Characteristics	12

Qualitative method

Occurring partly in parallel with work on the literature review, a qualitative case study was also undertaken. As mentioned, at these early stages of the research process, the focus was both broad and centered primarily on the empirical phenomenon of open and digital innovation in the video game industry. The case study served both as a way to further concretize and narrow down the focus of the overall research effort and to develop concepts and theory in line with the aim of the dissertation.

While users as external sources of innovation have been investigated before, in particular in the user innovation literature (West et al., 2014), many of these studies adopt perspectives in close proximity to the innovator and user (Baldwin and von Hippel, 2011). In other cases, they focus on mechanisms and processes mostly related to users' value creation processes, i.e., creating relatively well-bounded use-value for single individuals and small groups of users (Chesbrough et al., 2018). The qualitative study, on the other hand, sought to adopt a firm-centric perspective of firm capabilities employed in product development that have observable outcomes relating to performance. This also entailed development of concepts useful for hypothesis generation related to their outcomes and performance implications in the later papers.

Case method and selection

The case was chosen to be as informative as possible for theorizing, given the dissertation's aim to examine video game firms' dynamic capabilities to leverage user communities in DOI. This meant identifying a setting where such capabilities were developed, repeatedly applied and possible to observe. A single-case study was chosen, as this allowed a more in-depth study (and presentation of results), although at the cost of between-case comparison in the sense of comparing variations between firms (Eisenhardt, 1989; Yin, 2003). The research's focus on lower levels of analysis served to partly mitigate this inherent weakness of the single-case method through the examination of more than one product development project within the case firm. This holds similarities with embedded case designs (Yin, 2003). It also served as a soft control for the robustness of the observed capabilities between temporally separated projects involving different individuals and teams.

To identify a suitable case firm, several criteria were used to design a purposive sampling procedure in order to identify a particularly revelatory case (Eisenhardt and Graebner, 2007; Patton, 1980). Firm capabilities are emergent and relatively stable over time (Teece, 2007; Teece et al., 1997). Therefore, an emphasis on repeated application was important to avoid ad-hoc, but potentially successful, projects and products which's performance may be attributable to factors other than the capabilities. The case firm should therefore have developed and marketed several games where user involvement during the development processes was evident. Several of the firm's finished products should also have, or have had, active user communities in addition to functions or tools that allow user innovation, i.e., display platform characteristics. In terms of access, it was required that data collection was possible in close proximity to development processes; i.e., respondents should have worked in, or otherwise have an overview over the development projects. Following these criteria, a firm given the pseudonym Gaming Interactive in Paper II was approached and agreed to grant access to management and positions related to product development. A mandate was received to approach relevant respondents within the firm and an external collaborating developer firm. The processes of identifying respondents and negotiating access were aided by individuals with leading positions in the product development projects. Gaming Interactive is one of the leading firms in the Swedish video game industry, with an established reputation of developing and maintaining close relationships with the users of its products.

Qualitative data collection

Data were collected at the level of game development projects in the case firm, in line with the focus on lower levels of analysis. To this end, two products and product development projects, Gamma and Delta, were identi-

fied as focal points for qualitative interviews, which served as the main sources of data in the case. In addition to these, two other, smaller development projects were used as reference points to contrast differences and corroborate similarities between the development processes and characteristics of the products. The main source of data consisted of semi-structured interviews with key respondents with overview and insight into the specific development projects. These individuals held primarily mid-level management or higher positions, but also more technical positions. Table 4, taken from Paper II, gives an overview of the respondents. In total, 22 face-to-face interviews were conducted, 16 at Gaming Interactive and six at an external developer firm that collaborated closely with Gaming Interactive in the development of Delta. This outside perspective served as a useful complement to triangulate observations and perceptions from the respondents at Gaming Interactive. As outlined previously, a key characteristic of video game products is their potential to be developed and innovated over time, even after product launch. This is a defining trait of both Gamma and Delta, which have been continuously developed through internal development by the firm and external innovation efforts in user communities. As this is a central part of the case study, the interviews probed retrospective accounts from managers who were involved in these projects, as well as reflections and perceptions of ongoing processes.

Table 4. Respondents of qualitative interviews

Role	Firm	Length
Project leader	Gaming Interactive	48 min
Producer	Gaming Interactive	118 min
Sales manager	Gaming Interactive	81 min
Producer	Gaming Interactive	71 min
Brand manager	Gaming Interactive	37 min
Project leader (game design)	Gaming Interactive	46 min
Producer	Gaming Interactive	84 min
Lead programmer	Gaming Interactive	25 min
Tester & Quality assurance	Gaming Interactive	99 min
Game designer	Gaming Interactive	67 min
Scripter and researcher	Gaming Interactive	71 min
Project leader (programming)	Gaming Interactive	62 min
Community manager	Gaming Interactive	47 min
Community manager	Gaming Interactive	74 min
CEO	Gaming Interactive	68 min
CEO	Gaming Interactive	58 min
CEO	External developer	76 min
Game designer	External developer	50 min
Community manager	External developer	45 min
Game director	External developer	45 min
Programmer	External developer	27 min
Programmer	External developer	119 min

The interviews were based on topics relating to the involvement of users and user communities, both during the original development projects of Delta and Gamma and in their continuous development. Respondents were asked to describe overarching and specific parts of development, practices, roles and processes to internalize and utilize externally located information. Questions also involved the characteristics of products, as well as the development of features and product architectures, with a specific focus on openness at the product level. Questions posed were open-ended to capture emerging issues and processes, as well as potentially diverging perspectives between respondents and interaction between the respondent and interviewer beyond the pre-defined protocol (Mason, 2002; Silverman, 2012). Given the theory and concept development nature of the case study, the interview protocol was also allowed to be adapted and expanded between interviews to take advantage of emerging insights. This meant iteratively going back and forth between emergent theory and the interview data, letting both inform each other (Dubois and Gadde, 2002).

Qualitative data analysis

Interviews were recorded and transcribed using Nvivo software, a common tool for qualitative research (Gebhardt, Carpenter and Sherry, 2006) which also helped structure the work with the coding of the data. Analysis and coding were done through a variation of the Gioia method, an approach for structured coding of qualitative data and inductive concept development (Gioia, Corley and Hamilton, 2012). What diverged from this approach was a somewhat more pronounced use of *a priori* conceptions of theory than is formally advocated by Gioia et al. (2012), who emphasize a more grounded theorizing process. In particular, this related to the firm's ability to identify and internalize external information, and to develop products that display platform characteristics. These were at an early stage visible through secondary sources and are factors known to individuals with insight into the industry. This also constituted a main reason for the selection of the case as mentioned above. The case study and analysis method employed instead served to concretize the dynamic capabilities and, in particular, to investigate their constituent and underlying processes. As these capabilities display similarities and connections to established theory and extant research, this realization could arguably be seen as hindering a "blank slate" perspective that is purely inductive. As a result, an approach was opted for where these broader theoretical conceptions were used as a starting point, or a wide lens, when approaching the case analysis. What was seen as most important, however, was to avoid preconceptions of relationships, processes and mechanisms at the level where analysis occurs, i.e., at the process and product levels. As the focus was to explicate project- and product-level processes and practices underpinning firm-level capabilities, a broader *a priori* idea of firm-level concepts did not hinder this process. The coding process still had important and central inductive elements in identifying and conceptualizing these processes and practices. Existing concepts were never forced, and the purpose was to develop and adapt theory at a lower level than the firm, based on the case of Gaming Interactive and processes related to Delta and Gamma.

Practically, the first step of the analysis process identified first-order categories with a close proximity to the data, using categories and terminology consistent with and guided by the perspectives of the informants. These categories were then iteratively refined, re- and axial-coded until a final set of first-order categories emerged consistent with the data and the different observations. A second step synthesized and used these to create second-order categories, which are at a higher level of abstraction and more akin to grounded theoretical concepts. These were, in turn, used in a final step to formulate and create aggregate dimensions (Corley and Gioia, 2004; Gioia et al., 2013). While the first-order categories are characterized by being close to the perspectives of respondents, the second-order equivalents are formulated based on the researchers' perspective of the former. It is not until the

third step is finalized that a full and explicit transition to the theoretical plane occurs and a connection to extant research is made. A summary of the structure that these first- and second-order categories comprise, as visualized in Paper II, is shown in Figure 4.

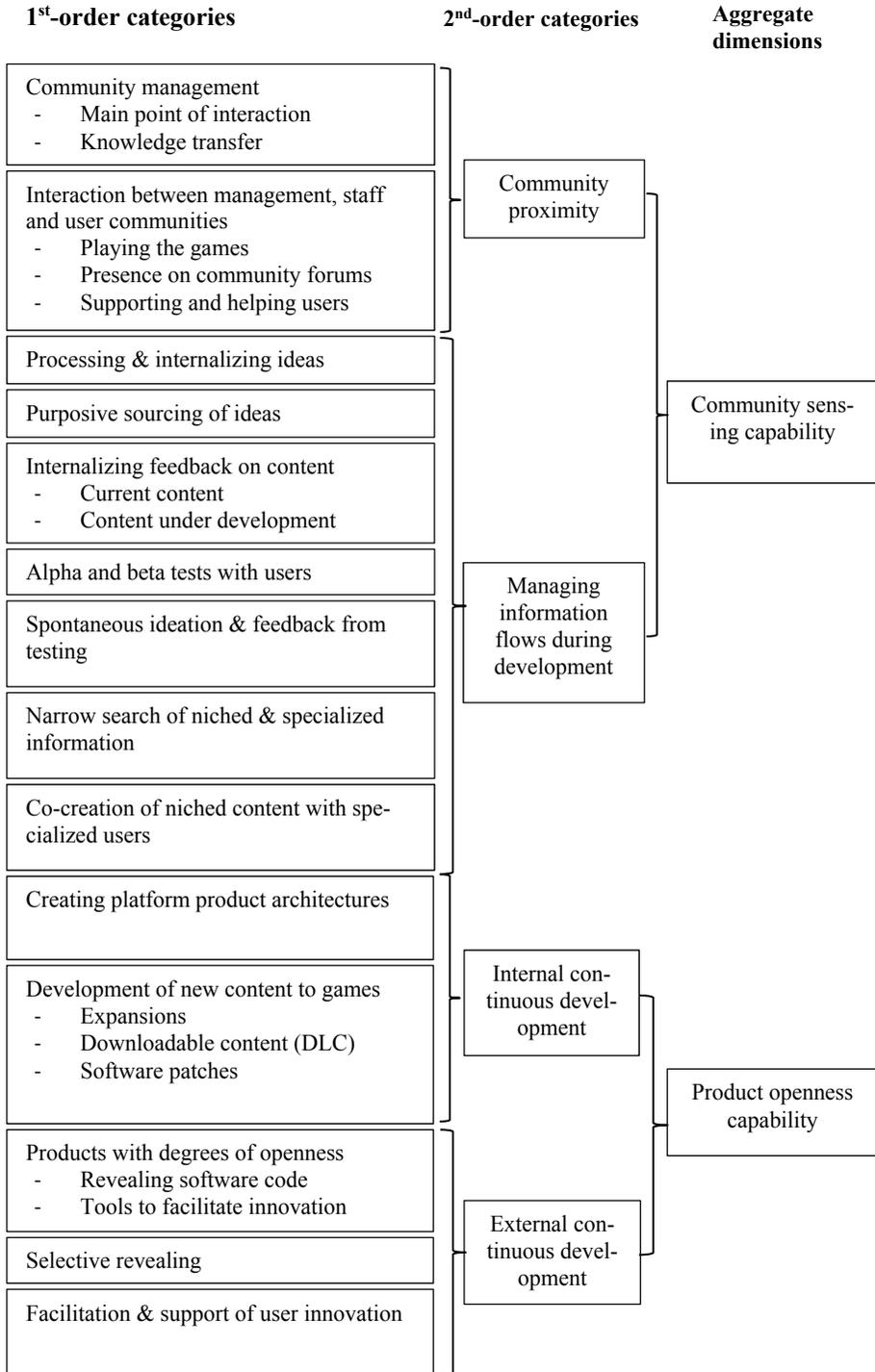


Figure 4. Qualitative data coding structure

Quantitative method

In line with the aim to examine dynamic capabilities to leverage user communities in DOI, the dissertation also draws on quantitative data and multivariate statistical analysis. While the literature review served to inform and position the research, and the qualitative case study helped in developing the theoretical concepts and to outline testable processes and mechanisms, two quantitative Papers (III and IV) served to test the relational structures between central theoretical constructs. Quantitative data in this dissertation consists of data collected from 151 game development projects using a survey instrument developed as part of the larger research project examining the Swedish video game industry. This development process was initiated during the early stages of the research process and lasted approximately one year. During this time, the research group worked collaboratively to create the survey instrument, which went through several minor and three major iterations before completion. The last two iterations were tested with industry professionals.

Survey design

The survey instrument was designed to cover a range of aspects of video game firms, video game products, and development processes as well as external collaborations in product innovation. Given the interdisciplinary interests of the research group, the survey drew on several established literatures to formulate and adapt measures to the context of the video game industry. The survey instrument is divided into three parts, each relating primarily to one theoretical domain and level of analysis. The first part of the survey addresses the firm level of analysis, mainly from the perspective of international business, with a specific focus on internationalization and firms' strategic and market interest in international markets. The second part focuses on a specific product and a retrospective account of its development. It thereby adopts the development project as the level of analysis, with product development and the specific product as focal units. This second part draws predominantly on innovation management and capabilities literatures to develop or adapt constructs and items. The third part collects data on external collaborations in product development. Here the level of analysis shifts to an inter-firm perspective. In this part, the respondent was asked to specify the external firm with the most significant impact on the development of the product specified in Part 2. It was thereby intended to capture the most important external collaboration to the specific development project. Theoretical constructs and items in the third part were adapted primarily from marketing and industrial marketing research streams, and these focus on relationship characteristics and aspects relating to the collaboration between the focal firm and the external contributor. In this dissertation, the

focal concepts, scales and theory used are measured in the second part of the survey, i.e., on a development project level of analysis that capture aspects of the product and development process. The theoretical areas covered in Parts 1 and 3 and their related methodologies are, however, outside its scope, and are not described in more detail than what has been outlined above.

Scale development

In developing the survey instrument, established scales were used whenever possible to optimize construct validity and reliability. Given the relative novelty of the research context, it was necessary to adapt items for nearly all constructs. In the following, an overview of the scale development of the constructs used in Papers III and IV of this dissertation stand as examples of the process of the larger survey instrument.

Focal constructs used were measured in the second part of the survey and adopt a project level of analysis. Items were primarily based on innovation management and capability literatures. The degree of adaptation required varied between constructs. In particular, scales measuring the dynamic capabilities and practices relating to innovation needed more change, as these reflect novel practices and processes. Outcome variables and performance measures, in contrast, did not require the same level of adaptation, as their formulations largely allowed generalization to the context of the video game industry. The work with adaptation was carefully done to balance the need for contextualization while staying as true as possible to original scales. Items were changed to refer to the context of video game development and games developed by the firm. Given the focus on the project level of analysis, items were worded to refer specifically to a predefined product and development. This rule applies to all items in the dissertation, save one concept reflecting levels of use-information, i.e., information about user demand and needs, which was measured at the firm level rather than the development project level. In the industry, many firms are SMEs, where a single larger project can often mobilize a majority of its employees. It was thereby not feasible to measure levels of use-information in specific development projects as something separate or different from the information held by the firm. Instead, the firm level was expected to be clearer and to make more sense to the respondent.

Given the dissertation's focus on dynamic capabilities to manage DOI with user communities, two constructs were developed relating to these. The first was a construct representing the community sensing capability, which was based on previous research on sensing capabilities and the case study in Paper II. A unidimensional scale measuring the application of such a capability in development projects was developed from the market sensing scale of Mu (2015). This original scale is based on previous work on sensing capabilities (i.e., Day, 1994; Teece, 2007) and was adapted by integrating work

on user communities in the video game industry. In relation to the product openness capability concept, a scale to measure the platform characteristics of products was developed that enables and facilitates external innovation by users. This construct is referred to as product openness in Paper III. The scale reflecting this construct was, similar to the community sensing capability scale, developed based on previous research coupled with the concept development in Paper II. This scale, however, focuses on enabling external innovation based on the product as a platform, while the case study also examines the dimension of internal development by the focal firm. This narrower focus is an emphasis on the dissertation's aim to examine video game firms' dynamic capabilities to leverage user communities. This construct is unidimensional and developed based on a scale capturing platform openness by Benlian, Hilkert and Hess (2015). The original scale was intended as an openness scale applicable across contexts and different types of platforms (Thomas, Autio and Gann, 2014). The quantitative analysis in Papers III and IV also included outcome variables related to the community sensing capability and product openness constructs.

Given the emphasis on outcomes and performance in the dissertation's research questions, performance was also measured quantitatively. A construct measuring the financial performance relative to internal and external benchmarks was used to reflect the performance of developed products. This was adapted from established scales in innovation management (e.g., Cheng and Huizingh, 2014; Griffin and Page, 1993; Salomo et al., 2007). To represent the performance of the development process, a construct reflecting the development speed of the product development project was used, based on work by Rindfleisch and Moorman (2001). To represent increased levels of internalized information from user communities in Paper IV, a construct termed use-information was operationalized as the amount of information about user needs and demand. It was conceptualized based on studies demonstrating the role of user communities as sources of information regarding user needs, demand and preferences (e.g., Hau and Kim, 2011; Jeppesen, 2004; Parmentier and Gandia, 2013). All concepts were captured through perceptual measures using 7-point Likert scales.

Both Paper III and IV also utilized firm size, age and degree of innovativeness of products as control variables. Size was measured as the number of employees at the point of data collection, and age was represented as the number of years between data collection and the firm's first product launch. The degree of innovativeness construct consisted of three items adapted from Cheng and Huizingh (2014). Furthermore, given that data on both independent and dependent variables comes from the same respondent and was measured with same instrument, potential impacts of common method bias was also assessed (Doty and Glick, 1998). As part of this, a marker variable was used (more on procedure below) which was selected following criteria for appropriate markers, i.e. theoretically unrelated, uncorrelated and meas-

ured using a similar procedure (Simmering et al. 2014). The marker variable used was a three-item construct capturing the degree of improvisation in external business relationships, based on (Hmieleski and Corbett, 2006; Miner and Moorman, 1998).

Quantitative data collection

Data were collected from firms active in the Swedish video game industry. To create as accurate and complete a list of this population of firms as possible, data on Swedish game developing firms from the trade organization Swedish Games Industry was used as a starting point. This list was compiled for different purposes than that of this dissertation, and it consequently also includes other organizations with interest and investments in the industry, but without game development as their core business. For these reasons, inactive or bankrupt firms, as well as organizations with a main business other than game development, such as specialized suppliers, consultants or investors, were excluded from the list. Other firms were added to the list through database searches and ad-hoc methods, such as tracing networks of individuals online and snowball sampling. These additions amounted to less than 10% of the final list. Based on this, approximately 370 firms were identified and were treated as a fair approximation of the industry at the time of data collection. Of these, 224 were active in video game development, had this as the central part of their business and have released at least one game. Given the dissertation's scope, this group was defined as within the scope of the study, and was contacted via email and/or telephone and asked to participate in the study. Of these 224 firms, 119 (53%) agreed to participate.

To optimize the probability of valid responses, identifying relevant respondents was key. A good overview of and insight into the firm's product development processes was set as a requirement for respondents. Respondents were identified through company websites and professional network platforms for most firms before these were contacted. An overview of respondents and positions is given in Table 5. In smaller firms in particular, management positions often have dual roles and work closely with development. A CEO or CTO of a smaller firm is therefore likely to be involved in individual development processes and may therefore be suitable as a respondent for the survey.

Table 5. Respondents in quantitative study

Category	Position	Number of respondents
Creative & Design	Art/Creative	3
	Game designer	10
	Producer	18
Development & Programming	Developer	7
	Sr. developer	11
Management	CD	8
	CEO	40
	CFO	1
	COO	2
	CTO	18
	Founder	17
	Marketing/Sales	5
	MD	4
	Project manager	3
Missing		4

To improve face validity and response rates, the survey was conducted as structured interviews either through site visits or video-calls. In the latter case, the respondent could, throughout the interview, read all questions through screen-sharing, in addition to being read them by the interviewer. This work was completed by myself, in addition to a small number of graduate students who had received training in performing the interviews. Interviews lasted, on average, between 30 and 60 minutes.

Population and sample characteristics

Before proceeding to describe the quantitative analysis, details of the population and sample is given in the following section. Characteristics at the industry, firm and project levels are briefly outlined.

The Swedish video game industry has expanded rapidly and constitutes a dynamic and fast-moving industry, making it a suitable setting to investigate the dynamic capabilities of video game firms. Confining the study to a national industry also served as a “soft control” of contextual factors that may differ between countries. The firms in the Swedish industry have developed some of the recent years’ most successful gaming titles internationally. A prominent exemplar is Minecraft, later acquired by Microsoft for \$2.5 billion

and one of the best-selling PC games, with 144 million copies sold (Sutton, 2018). Other global successes are the Candy Crush, Battlefield and Payday series (Nylander, 2018). Globally, every tenth person played a Swedish game in 2017 (Nylander, 2018). The Swedish industry is also characterized by rapid growth in turnover, number of companies and earnings. As a point of reference, the global video game industry saw a 13% increase in revenues, totaling \$138 billion in 2017 (Newzoo, 2018). The Swedish industry, in comparison, increased its revenues by 17% in the same period, totaling \$1.62 billion, and has had an average yearly revenue growth of 38% in the last six years (Nylander, 2018). During these years, the number of video game firms has increased by, on average, 20% per year, and earnings by 150% (Nylander, 2018). Accompanying this growth is, however, an increasing level of competition from both national and international firms. Like its global equivalent, the Swedish industry to a large extent needs to cater to international, if not global, markets. Data from the survey of the Swedish industry show that approximately 80% of the sampled firms sell between 81% and 100% of their games to international markets. This is largely enabled by transitions to increasingly digital distribution channels of products. In fact, digital distribution accounts for approximately 77% of sales in Sweden (Nylander, 2018), aligning with global trends where digital distribution increased from 31% to 79% between 2010 and 2017 (ESA, 2018).

The high growth of the industry has led to a significant emergence of SMEs, which make up a significant portion of the number of firms in the industry. In 2017, the Swedish video game industry saw a 22% increase in the number of firms (Nylander, 2018) and a 19% increase the previous year (Nylander, 2018). Despite the high prevalence of small and younger firms, a majority of the industry's firms are profitable (Nylander, 2018). Many of these are founded by industry veterans and senior talent from larger firms and incumbents, while others are started by junior talent attempting to establish themselves in the industry. In total, smaller firms account for more than half of the industry's employees (Kroon, 2017). Among the sampled projects, a majority were also conducted in small and medium sized firms. Sampling a high number of smaller firms thereby gives a fair representation of the industry. It also provides a good foundation for theorizing about capabilities to manage DOI with user communities. In contexts such as this, innovation and marketing-oriented capabilities are central for the performance of smaller firms (Sok et al., 2013), including video game firms (Li, Shang and Slaughter, 2010; Parmentier and Mangematin, 2014). Dynamic capabilities have also been shown to be important for SMEs (Arend, 2014; Corner and Wu, 2012; Sok et al. 2013), and in particular sensing and seizing capabilities (Liao et al., 2009). Openness in innovation processes, in turn, allows smaller firms to mitigate challenges resulting from liabilities of smallness (Bianchi, Croce, Dell'Era, Di Benedetto and Frattini, 2010; Chesbrough 2010; Gassman et al., 2010; van de Vrande et al., 2009). Extant research has

also shown that digital technology facilitates SMEs' utilization of OI (Chesbrough, 2010; Henkel, 2006; Piva, Rentocchini and Rossi-Lamastra, 2012) and that OI with users is particularly promising for smaller firms (Ahn, Minshall and Mortara, 2015).

For both smaller and larger firms, the most basic value network required to create and market a video game typically consists of three key actors. The developer is the creative and technical creator of the game, while a publisher is often a necessary partner for funding, market and in some cases technological and design knowledge. Some developer firms, however, publish their own or co-developed games themselves, and thereby assume both roles. The type and characteristics of the relationship between publisher and developer can also vary from arm's-length publishing deals to close collaborations in development and design work. Lastly, one or several distributors distribute, market and sell the finished game to users through digital or traditional channels. Here, digital distribution platforms like Steam are becoming increasingly important actors (Koch and Bierbamer, 2016). The survey predominantly included developers (55%) and developers publishing their own games (41%). Certain publishers that were significantly involved and had an overview of the development process of the focal game were also included in the sample (4%).

The industry's rapid technological development and high growth continuously contribute to a shortening of product life-cycles (Li et al., 2010; Readman and Grantham, 2006). Yearly improvements in hardware capabilities means that the scope, systems, features and graphics of products are areas of constant improvement and development. This brings a high rate of product innovation but also compressed product life-cycles. In just a few years' time, new products show significantly improved technical performance compared to older games. While the technological progress allows developing firms to do more, and to constantly expand and improve when launching new products, it also enhances competition and the need for highly specialized technical competence and timely development processes. As a consequence, the success of individual products and product innovation are pivotal for video game firms. Data from the sampled projects also demonstrate this importance of individual games and development projects. In the sample, more than 58% of the projects took up between 61% and 100% of the firms' yearly product development budgets. The focus of this type of firm on individual development projects is also evident in the high share of the firm's employees that are involved in developing each game. In the sample, 62% of the projects involved between 81% and 100% of the firms' employees at least half-time and 76% of the projects involved between 61% and 100%.

Quantitative data analysis

In terms of quantitative analysis method, both Papers III and IV used structural equation modelling (SEM) using linear structural relations modeling (LISREL) to analyze the survey data. SEM is a group of statistical techniques suitable for the analysis of relationships between multiple variables (Hair et al., 2014:546). It has similarities to, and can be seen as an extension of, factor analysis and multiple-regression techniques. An important benefit and difference to the latter is the possibility to examine several dependence relationships in the same model. SEM simultaneously estimates interrelations between variables that may be both independent and dependent variables in different relationships (Hair et al., 2014:552). This allows for a more complex set of relations between concepts than multiple regression. Another strength of the method is the estimation of relationships between latent constructs. A latent construct is represented by several measured variables and is based on the consistency between these, which is similar to how individual variables form factors in factor analysis. The ability of SEM to use latent constructs helps reduce measurement error of the construct through the use of multiple measures to represent each construct. SEM using LISREL also facilitates the estimation of dependence relationships by taking into account estimations of measurement errors in the constructs (Hair et al., 2014:547). In comparison, a regression coefficient in multiple regression will always understate the true relationship between variables in the presence of measurement error, which to some extent almost always exists in management and organizational research. This may yield results that are non-significant when in actuality a relationship exists, i.e., resulting in a type II error. SEM, however, takes estimated error into account and “corrects” coefficients, allowing for a more accurate identification of relationships (Hair et al., 2014:549).

The SEM analyses followed the two-step modelling approach advocated by Anderson and Gerbing (1988). In this method, a measurement model containing indicators (individual items) and latent constructs is first assessed to establish the convergent and discriminant validity of the constructs. Only when these have been evaluated and established to a satisfactory extent does the analysis proceed to an estimation of a structural model specifying relationships between constructs. In this second step, the structural model is assessed by estimating the model’s overall fit and hypothesized paths between latent constructs. As SEM estimates several relationships simultaneously, with the aim to assess an overall structure of interdependences between concepts, the models’ fit is the most important tool to evaluate its predictive accuracy (Hair et al., 2014:552). Model fit is provided in the form of a number of different statistics, which are used to accept or reject the whole model (this is done for both measurement and structural models), preceding any interpretation of individual relationships. Good model fit indi-

cates that the specified theory, i.e., the measurement and structural model, provides a reasonably accurate representation or reproduction of the data.

To test for common method bias, Harman's one factor test (Podsakoff and Organ, 1986) was used. This test examines to what extent a single factor can explain the covariance between measures when loaded into an exploratory factor analysis. If a single-factor model account for a high amount of the variance, this is an indication of common method bias influencing the results. As a further test, a marker variable was utilized to assess the presence of potential bias (Podsakoff, Mackenzie and Podsakoff, 2012). This test is commonly assumed to be better at identifying true bias and is based on the principle that introducing an uncorrelated and theoretically unrelated construct into the measurement model can give an indication of common variance that is due to bias. The procedures and results of analyses are described in more detail in the method sections of Paper III and IV.

4. Summary of papers

Paper I: Opening the black box: A review of micro-level research in open innovation

Paper I was the result of an effort to review OI research utilizing a lower level of analysis than the firm. OI was introduced as a firm-level concept examining new forms of innovation management strategies at this level (Chesbrough, 2003). Given this focus, the majority of especially early OI research focused on the firm level of analysis using firm-centric perspectives (West and Bogers, 2014). There has, however, been an increasing interest and focus on the lower levels of analysis in OI research that complement firm and higher-level perspectives (e.g., Salge et al., 2013).

In practice, OI is typically a top-down strategic decision at the firm level, while innovation processes occur at lower levels of analysis. The development of the firm's offerings and external search processes are, as a rule, located and carried out at the project level (Haas, 2010; Hobday, 2000; Shenhar and Dvir, 2007; Sydow et al., 2004). In addition, agency and specific roles like gatekeepers (Allen, 1977), knowledge brokers (e.g., du Chatenier, Verstegen, Biemans, Mulder and Omta, 2010; Ollilla and Yström, 2016) and microfoundations of absorptive capacities all reside on the individual level (Cohen and Levinthal, 1990). Furthermore, outcomes and performance of OI processes have been demonstrated to be impacted by variables and mechanisms at lower levels than the firm (e.g., Christiansen et al., 2013; Salge et al., 2013; Thanasopon, Papadopoulos and Vidgen, 2016; Tranejekjer and Sondergaard, 2013).

Several reviews of the OI field exist, and these have taken different focuses and perspectives (Bogers et al., 2016, 2018; Dahlander and Gann, 2010; Elmquist, Fredberg and Olilla, 2009; Gassman, Enkel and Chesbrough, 2010; Greco, Grimaldi and Cricelli, 2015; Huizingh, 2011; Remneland Wikhamn and Wikhamn, 2013; West et al., 2014). While some of these existing efforts have incorporated the perspectives of different levels of analysis (e.g., Bogers et al., 2016), extant research has not taken lower levels of analysis as a specific focus and attempted to review this research systematically. The aim of this paper was thereby to review the research in OI adopting lower levels of analysis than the firm. This aligns with calls for greater focus on the lower levels of analysis in OI (Chesbrough and Bogers, 2014; Du et al., 2014; Felin and Zenger, 2014; Schroll and Mild, 2012). The

paper was also intended as a stepping-stone for additional work on these lower levels by providing an overview of previous studies, in addition to highlighting the permeable boundaries between levels of analysis in OI (Bogers et al., 2016).

In order to conduct a transparent and replicable search and review process (Tranfield, Denyer and Smart, 2003), the paper followed a systematic design informed by previous reviews in OI. The review was delimited to journals central to OI (West and Bogers, 2014), established search terms (Randhawa et al., 2016) and a commonly used starting point for the field (i.e., Chesbrough, 2003). Starting off from an existing typology of levels of analysis in OI (Chesbrough and Bogers, 2014), conceptual work on microfoundations and multi-level research (Coleman, 1990; Felin, Foss and Ployhardt, 2015; Hitt et al., 2007; Rousseau, 1985) were used to operationalize levels of analysis and categorize extant research. The search was conducted in 2017 and, in total, 494 articles were analyzed, out of which 97 utilized lower-level perspectives and formed the basis of the review.

The paper identified the project ($n = 59$) and individual ($n = 38$) levels as two distinct and overarching groups of lower-level research in OI. Both of these groups contain a number of different focuses and research topics which were used to identify thematic categories in these bodies of work. At the project level, product and service development, co-creation and user collaboration, open collaborations and relationships, knowledge and IP management, and crowdsourcing were identified as distinct categories. At this level, three areas are identified in the paper where further research is especially relevant. First, there is a need for more studies examining the outcomes and performance implications at the project level. Much of the existing findings in this area rely on aggregated and firm-level data where lower-level heterogeneity is often lost or not visible. Second, there is a dearth of studies looking at the implications or outcomes of variables related to external relationships and relationship characteristics. Relationship variables affect the outcomes of innovation projects (Du et al., 2014; Taheri and Geenhuizen, 2016; Tranejekjer and Sondergaard, 2013), and this thereby constitutes an important gap. Third, there is overall a lack of research of leveraging crowds and communities at the project level beyond innovation competitions and crowdsourcing efforts. Research here is also typically qualitative and dominated by case studies. Because of this, there exists a need for more quantitative research on the effects of utilizing crowds and communities at the project level. Among the studies focusing on the individual level, attitudes, motivations, roles and characteristics constitute thematic categories. Across the board, there is comparatively less done on individuals internal to the organization than external individuals. Among the studies that do focus on internal individuals, most have investigated specific roles that facilitate OI, and as a result, more is needed on the attitudes, motivations and characteristics with individual-level data. When it comes to individuals external to the organiza-

tion, more empirical evidence is generally available in all thematic categories, but there is a need for more research examining how to manage individual-level variables and drivers and to examine their effects.

Paper II: Leveraging User Communities in Digital Product Innovation: Community sensing and product openness capabilities in the video game industry

The second paper is based on a qualitative case study of a video game firm particularly adept at utilizing user communities to enhance product innovation. This firm has repeatedly leveraged user communities both as sources of information during development processes and for external innovation by creating products that function as innovation platforms.

Digital technology and innovation are both enablers of new opportunities to leverage crowds and communities for innovation (Franke et al., 2013; West et al., 2014). It has allowed, and made feasible, a greater integration of geographically dispersed actors into firms' innovation processes and made information and knowledge transfer significantly more effective (Yoo et al., 2012). As a result, OI strategies for product innovation (Chesbrough, 2003) become especially relevant for digital innovation and the development of digital products. These changes and emerging opportunities brought by DOI, however, also entail new challenges for management (Nambisan et al., 2017).

In the video game industry, digital innovation and utilizing users and user communities have been characteristics of product development for some time. Here, certain firms have developed dynamic capabilities allowing them to leverage user communities as information and innovation sources in order to drive long-term performance at the product level. This is significant in a context characterized by rapid technological development, changing market dynamics and short product life-cycles. Previous research on the industry has investigated aspects of these processes (e.g., Koch and Bierbamer, 2016; Parmentier and Gandia, 2013) but not conceptualized them as distinct or coherent capabilities. Given the increasing potential and prevalence of utilizing communities and crowds for innovation (West and Lakhani, 2008; West et al., 2014) and a need for theory development of management of digital innovation with user communities (Chesbrough et al., 2018; Nambisan et al., 2017), this was identified as an area worth pursuing. The aim of this paper was therefore to conceptualize the capabilities that allow video game firms to leverage user communities as sources of innovation-conducive information and product innovation, as well as to elaborate on how such capabilities are linked and their effects at the product level. From a dynamic capability perspective (Teece et al., 1997), the paper built on research in strategy

and marketing (e.g., Day, 1994; Teece, 2007) as well as work on innovation platforms (e.g., Gawer and Cusumano, 2002; Tiwana et al., 2010) and user communities (Jeppesen, 2004; Koch and Bierbamer, 2016; Parmentier and Mangematin, 2014) to conceptualize community sensing and product openness as two distinct dynamic capabilities.

The study builds on a single-case study of product development projects conducted by Gaming Interactive, a pseudonym for a Swedish game developer with a track record of community involvement and close relationships with users. Empirical data was primarily based on semi-structured interviews (N = 22), which were analyzed and coded using a structured approach (Gioia et al., 2013).

User communities are repositories of information about user needs, demand and preferences that are conducive to product innovation (Hau and Kim, 2011; Jeppesen, 2004). Through capabilities that enable the firm to sense, identify and internalize this information, video game development firms are able to define actable opportunities for the development of new and existing products. The malleable properties of digital innovations (Zittrain, 2006) and the community sensing capability thereby provide firms with the means to innovate products in response to emergent change in user needs and to identify latent demand. The case study shows that a close proximity of internal development processes to user communities is important and facilitates information transfer and sensing processes. Furthermore, the case-firm's community sensing capability is also underpinned by processes at the project level designed to identify and internalize information into ongoing development processes.

The case-firm also continuously expands and further develops products throughout their life-cycles. Coupled with this internal development of already-marketed products are user innovation processes that complement and overlap the firm's developments. Previous research has shown how user innovations building on existing products as innovation platforms complement internal development (Arakji and Lang, 2007; Koch and Bierbamer, 2016; Parmentier and Gandia, 2013) and help adapt products to changing market conditions (Tschang, 2007). By providing an extensible base providing shared functionality and a set of core systems (Tiwana et al., 2010), the platformed product gives users a foundation for creating further development and modular additions. These user innovations complement internal development by broadening the product's scope and features. The study found the firm's product openness capability to significantly extend the life-span of products and increase their performance over time. The capability is underpinned by processes allowing continuous development by both the firm and community users. In addition, community sensing serves to inform the internal development by the firm but also the creation of platformed products, tuning openness and the creation of tools that facilitate user innovation building on the platformed product.

Paper III: Two types of openness to leverage user communities in the video game industry: Community sensing and product openness

The third paper built on the concept development in Paper II but moved to quantitatively test effects and relationships identified by the qualitative case study. Paper II outlined community sensing and product openness as two distinct dynamic capabilities. This paper examines the community sensing capabilities of video game firms in addition to the effects of leveraging products as platforms for external innovation, termed product openness in the paper.

Video game firms have capabilities that allow them to simultaneously utilize user communities as sources of information about users and as sources of product innovation (Koch and Bierbamer, 2016). Inflows of this type of information are enabled through purposive sensing processes (Day, 1994; Teece, 2007) and entail a degree of openness in the development or innovation process. Community users innovate using an existing and already-marketed product as a foundation or base, which is enabled by a purposive design of products with degrees of openness. These two types of openness are the main focus of the third paper, where the aim was to test the effects of these at the development project level on the efficiency, in the form of the performance of the product, and the process's effectiveness, in terms of development speed. Similar to Paper II, community sensing is seen as the firm's ability to identify and internalize information about users relevant for internal innovation. Product openness, in turn reflects the degree of openness to user innovation in the finished product that enables modular innovations by users. To develop a theoretical model, the paper draws on work on innovation in user communities in the video game industry (e.g., Koch and Bierbamer, 2016; Parmentier and Gandia, 2013), but also capability literatures (e.g., Day, 1994; Teece, 2007) and work on innovation platforms (e.g., Gawer and Cusumano, 2002; Tiwana et al., 2010). Quantitatively examining these two types of openness to user communities simultaneously and at the project level has not been done in extant research. This approach allows a comparison of different forms of openness and their effects on performance, and also shows the interrelation between different OI practices.

For the quantitative analysis, Paper III relies on SEM with LISREL software. Based on a dataset of 151 development projects in the Swedish video game industry, the paper develops and tests two nested structural models. In the first model, the two types of openness are hypothesized to both directly and indirectly affect performance, and in the second nested model, only indirect effects are specified. Testing of the first model served to demonstrate a lack of significant positive direct effects, while the re-specified second model more parsimoniously demonstrated indirect effects. The analysis found

community sensing to be positively related to openness in products, indicating that openness to information about user needs, demand and product use during development tends to increase openness in the product design. Direct or indirect effects between community sensing and performance were not supported, while product openness positively impacts the speed of development and the financial performance of products indirectly.

The paper contributes to OI by testing two forms of openness to user communities in product development. In terms of the impact on performance, openness in products is, according to the results, the more rewarding form. Community sensing, however, serves to inform development work and either make the firm more inclined or better able to design products with platform characteristics. When investigating the effect of openness on performance, extant studies have found mixed results as well as dependencies and contingent relationships (Asakawa et al., 2010; Chiang and Hung, 2010; Kim and Park, 2010; Knudsen and Mortensen, 2011; Laursen and Salter, 2006; Tranekjer and Søndergaard, 2013). The results from this study follow in a similar vein by showing that different forms of openness may have different impacts on performance at the product development project level in addition to showing that they can be interlinked.

Paper IV: Community sensing capabilities in the video game industry: Utilizing information in user communities to impact product performance

The fourth paper builds on both Paper II and Paper III. Similarly, to Paper III, it is a quantitative paper examining a theoretical model using SEM with LISREL. An important rationale for the paper was the inconsistent results between the qualitative study pointing to the importance of community sensing and the non-significant effects between sensing and performance in Paper III. This, in addition to indications from previous research of a possible indirect mechanism, provided a background for conceptualizing and testing an indirect path between community sensing and performance via increased levels of use-information, i.e. information about user needs, demand and product use.

Product innovation processes occur in close proximity to user communities in the video game industry, and communities are important sources of information on user needs, demand and product use, which is conducive to innovation (Hau and Kim, 2011; Jeppesen, 2004). This information is more extensive and up-to-date than what the firm can accumulate on its own at any given point in time, but also situated and embedded in the communities. To successfully tap this difficult-to-transfer information and use it to inform product innovation, firms have made efforts to develop processes aiming to

leverage firm-community interactions (Burger-Helmchen and Cohendet, 2011; Dahlander and Magnusson, 2005; Parmentier and Mangematin, 2014). In this context, capabilities that allow the firm to anticipate opportunities for product innovation by identifying and internalizing information from user communities can be expected to be particularly pivotal. Such sensing capabilities (Day, 1994; Teece, 2007) have scarcely been examined in community contexts, however. In addition, there is a need for more research on the effects at the development project level of leveraging user communities for product innovation (Koch and Bierbamer, 2016). Against this background, Paper IV aimed to test the effects of community sensing capabilities in product development as a way to increase levels of information about user needs, demand and product use and impacts on performance at the project level.

Based on previous research on sensing capabilities and work on the video game industry, the paper formulates a number of hypotheses. Competing hypotheses specified a positive (negative) effect of community sensing on financial performance. A positive effect of community sensing was expected on levels of information about user needs, demand and product use, as well as a between this construct and performance. In addition, the paper also hypothesized an indirect and positive indirect effect between community sensing and performance via this mechanism.

Data from a sample of 151 product development projects in the Swedish video game industry were used to test these hypotheses using SEM with LISREL. Community sensing was found to increase the levels of use-information and, via this process, to indirectly and positively affect the financial performance of products. The paper also found a negative direct effect between the capability and performance, and the model thereby demonstrated an inconsistent mediating relationship (MacKinnon, Fairchild and Fritz, 2007) between the two constructs. These results highlight the role of community sensing capabilities as a way to identify and internalize information about users relevant for product innovation. It also shows the positive effect of increasing this type of information and the possible detrimental effect of having ineffective sensing processes in development. The firm must thereby ensure that these processes actually result in an accumulation and internalization of information useful for development.

The paper contributes to work in capability literatures by expanding on and developing previous notions of sensing capabilities in marketing and dynamic capability streams (e.g., Day, 1994; Teece, 2007). The paper also contributes to OI by examining openness in development projects to user communities and aligns with calls for more work on lower levels of analysis (Bogers et al., 2016; Randhawa et al., 2016; West et al., 2014) and at the project level in particular (Du et al., 2014; Felin and Zenger, 2014; Kim et al., 2015). By integrating work on sensing capabilities and a dynamic capability perspective, the paper also contributes to efforts to establish more ex-

plicit connections between OI and analogous theory (Bogers et al., 2016; Randhawa et al., 2016).

5. Main findings and conclusions

The aim of this dissertation is to examine video game firms' dynamic capabilities to leverage user communities in DOI. To this end, the empirical results outline and conceptualize two distinct capabilities to manage DOI toward user communities at the innovation process and product levels. The first capability has been termed community sensing, which utilizes openness in digital innovation processes to user communities. It is a capability that, when applied in product development, generates information about user needs, demand and product use which can be turned into opportunities for product innovation. The second capability leverages openness in digital products. What is conceptualized as a product openness capability captures the abilities of firms to use platform characteristics to couple internal continuous development with the enablement and management of external innovation in user communities. Both capabilities are to a large extent reliant on, and connected to, the characteristics of digital innovation. These greatly facilitate information transfer across firm boundaries and between actors (Nambisan et al., 2017) and make products permeable, open and transferable (Zittrain, 2006).

In the following sections, the dissertation's main findings are summarized in relation to the research questions presented in the first chapter of this summary. This final chapter also includes notes on theoretical and managerial implications, and implications for future research.

Community sensing capabilities

Extant research has shown that decreasing costs and improving capacities to transfer information with digital means (Yoo et al., 2012) have brought increasing effectiveness, efficiency and potential to utilize large numbers of external complementors (Boudreau and Lakhani, 2013; Schweitzer, Buchinger, Gassmann and Obrist, 2012). A central consequence of DOI is the breadth with which it is possible and feasible to utilize inbound flows of information and involve external actors in innovation processes. Capabilities to sense, identify and internalize relevant information (Day, 1994; Teece, 2007) become pivotal in this context to make use of innovation-conducive information located in settings such as user communities (Jeppesen, 2004). Sensing capabilities have scarcely been investigated, conceptualized and

described in the context of user communities and digital product innovation, however—which is something that this dissertation has done by answering research questions I and II. The findings explicate a capability that enables the utilization of user communities as sources of innovation by developing and investigating the concept of community sensing. These findings also shed light on central outcome variables by identifying and empirically testing their effects in product development projects.

The first research question of the dissertation relates to how video game firms utilize sensing capabilities to leverage user communities in product innovation. This necessitated conceptualizing this type of dynamic capability in addition to its constituting processes. The concept of community sensing is defined as the firm's ability to identify and internalize innovation-conducive information from user communities. Previous research on sensing capabilities has examined processes to elicit information and opportunities from a range of external market actors (Day, 1994; Mu, 2015; Ngo et al., 2018; Olavarietta and Friedman, 2008). The community sensing concept instead captures a more focused capability tuned toward a particular actor type: user communities. This is a development of the sensing capability concept that is necessary, as the processes constituting sensing toward user communities are different from those targeting a broader customer base or other market actors. User communities display different characteristics than groups of customers or users (Burger-Helmchen and Cohendet, 2011) and hold more extensive information about user needs and demand than individual users or firms (Hau and Kim, 2011; Jeppesen, 2004). They also consist of complex networks in which this information is largely embedded (Dahlander and Frederiksen, 2012; Fuller et al., 2007; Ganley and Lampe, 2009; Malinen, 2015) and require specific processes to be leveraged effectively (Dahlander and Magnusson, 2005; Parmentier and Mangematin, 2014). User communities can be significant sources of innovation (West and Lakhani, 2008), in particular for digital and open innovation—which makes this concept development worthwhile.

The dissertation identifies community sensing as a concept capturing the firms' abilities to draw on user communities as a source of information influencing and enhancing product innovation both before and after products are launched. The research also outlines constituent practices and processes in development projects that underpin this firm capability. The case study offers qualitative evidence of how a community sensing capability acts as a way to generate, identify and internalize use-information from user communities that is conducive to product innovation. By fostering a close proximity to user communities through formal community management practices and a more informal closeness between employees, management and users, firms can create new, and facilitate existing, inroads for inbound flows of information. This provides points of interactions and knowledge transfer mechanisms between the firm and user communities as employees and manage-

ment engage with users, are present on community forums, and help and support users. Fostering this proximity in combination with establishing and managing channels and identifying and internalizing use-information from them constitute the community sensing capability of the case firm. The qualitative data further support the notion that applying this capability in development results in the identification and articulation of opportunities for product innovation. An example of this is given by the following quote from Paper II where the CEO of the case firm describes a situation where sensing, applied to external ideation results in actable opportunities for product innovation:

It's like... you do an expansion for a game for example, then you get a lot of feedback, a lot of good ideas on what you can do as a next step and what people want to see. So, there are many polls and things like that. We have a community forum that is very active; we have over 200,000 registered members, so it's easy to get information. Our best example is: we are going to make an expansion to [Delta], it's called [...]. We asked on the forum: what would you like to see in an expansion? And then we collected the 10 best ideas and then we did it. – CEO.

In this instance, the community sensing is not primarily the initiation of the external ideation, but the ability to identify the 10 best ideas and the relevant use-information contained within them. In this particular example, the expansion in question became one of the most successful.

The second research question of the dissertation emphasized the performance outcomes of sensing capabilities enabling the utilization of external user communities as sources of information conducive to product innovation. It thereby put a focus on the implications and performance outcomes of applying community sensing capabilities. The case study also presents qualitative evidence of such performance implications, and while useful for theory development, this type of data has obvious limitations. These concern, in particular, the statistical generalizability of findings and their ability to supporting causal inferences like performance implications. Therefore, the dissertation also test the prevalence and effects of community sensing quantitatively using data from 151 development projects in the Swedish video game industry. Separate analyses in Papers III and IV focus on different mechanisms but hypothesize links to performance at the project level, building on the qualitative work. Taken together, the dissertation finds an indirect link between community sensing and the financial performance of products channeled via increased levels of use-information. This is consistent with the qualitative findings positioning the capability as a way to internalize information about user needs and demand embedded in user communities. When not modeling use-information as an outcome variable of community sensing, the analysis fails to positively link the capability to the performance of products. So, in conclusion, the quantitative analyses do not support positive,

direct links between community sensing and development speed or the financial performance of products, but offer support for indirect relationships. The empirical results thereby indicate that community sensing capabilities do have effects on the financial performance of products, but that this effect is indirect rather than direct. The findings paint the capability mainly as an enabler and facilitator of inbound flows of difficult-to-transfer but relevant information that reveals development opportunities which, in turn, drive performance.

Product openness capabilities

As digital products, video games are innately malleable, dynamic and reprogrammable (Zittrain, 2006), and as a result have a high propensity to be partially open. Extant studies have also shown that video game firms have a tradition of using this potential for openness at the product level to utilize the strong user innovation traditions characterizing many user communities (Jeppesen, 2004; Koch and Bierbamer, 2016). The capabilities and processes needed to create and manage digital products and platforms that enable and make use of value creation of intrinsically motivated users is, however, underresearched in OI (Chesbrough et al., 2018). By aligning with previous research of innovating users in the video game industry and integrating work on digital platforms with a dynamic capability perspective, the dissertation contributes at the intersection of digital and OI management. In sum, the dissertation's findings on product openness add to an understanding of how DOI and openness at the product level can be used to combine internal development with external innovation from user communities. As mentioned, platform concepts have proliferated in management research (Thomas et al., 2014), and the outcomes of combining internal and external innovation from users over time have similarities with other forms of innovation platforms—in particular, product-family platforms (Meyer et al., 2017) and platforms as the bases of ecosystems (Boudreau and Lakhani, 2009; Thomas et al., 2014). The concept of a product openness capability that couples internal and external innovation in user communities based on a product as a platform is, however, novel.

The third research question of the dissertation focused on the utilization of product openness capabilities to leverage user communities in product innovation. The question emphasizes the constituting processes of capabilities enabling the creation of digital products working as innovation platforms to manage DOI with user communities. As with the first research question, the question implies a focus on the application of a firm-level capability. The dissertation conceptualized a product openness capability as the ability of firms to create and manage products functioning as platforms for continuous development and the coupling of internal and external innovation. By

providing a core functionality and base for modular innovation (Tiwana et al., 2010), products are turned into platforms for continuous development by both the firm and users. This allows development of the product in response to shifting needs and identified opportunities throughout its life-cycle, granting the firm flexibility in development (Buganza and Verganti, 2006). It enables leveraging and managing ecosystems of external complementary innovations (Cusumano and Gawer, 2002) that add value to the platformed product, in addition to increasing the efficiency of the firm's internal development. At the level of product development, the capability is constituted by the management of internal development and external innovation by users. The firm internally develops additions, updates and changes that solve issues in previous versions but also add functionality and features, and extend the scope of products over time. An example of the resultant change to products is captured in this quote from a respondent in the qualitative study in Paper II:

[...] before Christmas this year it had the highest number of players ever. I think that has surprised everyone; how good it has lived on. It is also a markedly different game now compared to when it was released, you wouldn't recognize it. Or well, I am exaggerating a bit, you would still recognize it, it still has that map so... but it is a lot more systems, the map has been expanded a lot more. For example, I think it originally ended in the Middle East, now there is India and a large part of Asia. It is something like this we are hoping for with [Sigma]. We want to have a game that lives for a long time. – Producer.

Parallel to this development are external innovation processes by users, resulting in modular modifications, changes or additions to the product. These are typically lesser in scope than what the firm produces but also often more closely tied to very specific preferences of community users. While the internal continuous development is enabled through product architectures that facilitate additions and changes, the external development results from degrees of openness in products, selective revealing of intellectual property (programming code), software tools and support efforts by the firm. An illustration of how this was approached and managed by the case firm is evident in the following quotes. Together they show how the firm's management of external innovation in user communities is one of enablement and facilitation, and where control is maintained in terms of what can be changed, rather than how.

We want the modders to help create content to our games... In all honesty to improve them, from what we have created. We have made a base-game. I want to see where the users take it after that. We have seen modders create assets, maps, and they add functionality to the games. I have seen Mars-maps and Moon-maps. I have seen first-person mods, and a helicopter-mod where you can fly around. It is really fascinating to see everything that people do with what we have created for them. We want to open for this type of creativity where you can do what you want with the game, and it is right here that modding really helps. – Producer.

We have made our games more and more open. Almost everything in [Delta] is made up of text-files, or open graphics-files. Except the source code of course, the central functions in the game. So, you can change Almost everything. You can do a fantasy game on the map, and change all the features. So, people are basically doing that. – Game Designer.

The fourth research question of the dissertation was concerned with the performance outcomes of utilizing product openness capabilities to leverage user communities in product innovation. The research shows how the product openness capability enables a continuous development of already-marketed products over time, which increases their longevity and sales performance. In a dynamic industry characterized by short product life-cycles, this effect is important. The case data indicate an increased and, in particular, prolonged financial performance of products as a result of applying the product openness capability in development. This is demonstrated by Figure 5 and 6 from Paper II, which show the sales-curves of two of the examined games. Here, it is evident that the performance of the products does not follow a traditional increase, peak and decline but instead have subsequent peaks that in many cases tend to coincide with releases of additional content (Expansions).

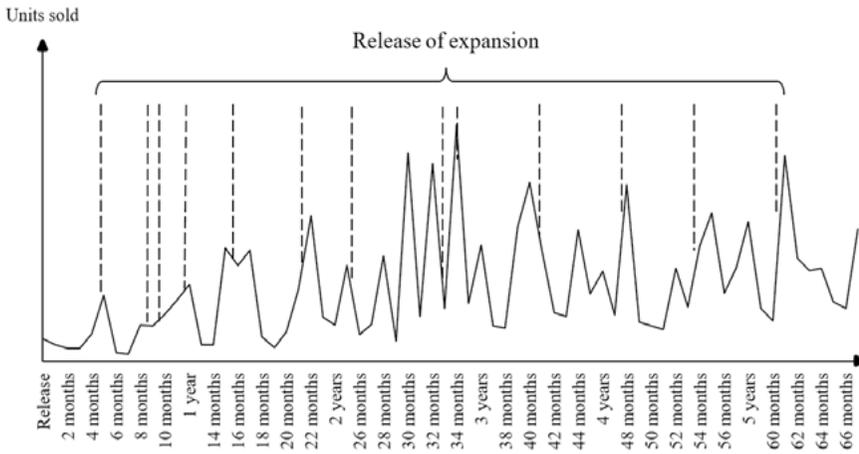


Figure 5. Sales performance of Gamma

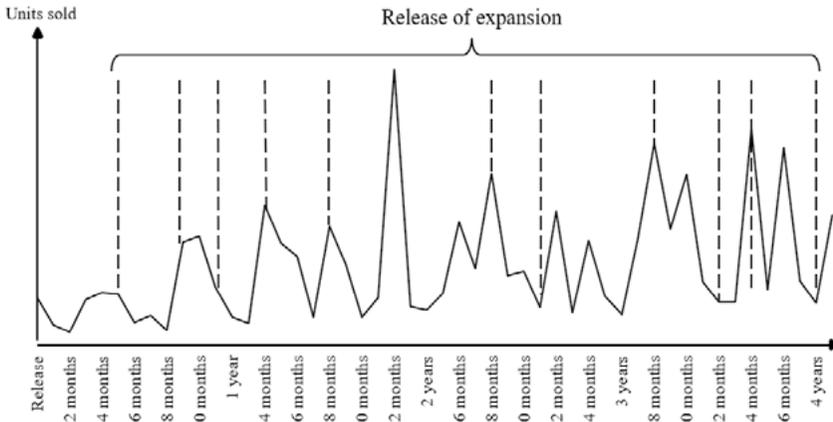


Figure 6. Sales performance of Delta

This effect is attributed to several mechanisms. The internal development of the firm serves, as mentioned, to add functionality and update products throughout their life-cycle in response to changing and emerging user needs. This internally developed content is sold at high margins to existing users of the product and, in addition, adds value to the original product by improving its functionality and scope, which drives sales of the original product. User innovations from communities similarly add value to the product by increasing its functionality and features, and importantly, often through ways not anticipated and/or prioritized by the firm. This creates a complementarity between the internal development by the firm and the external development by users, which also bridges the gaps between releases of firm-developed content, as captured by another respondent from the case study in Paper II:

I think it is damned positive to leave the games as modifiable as they are. In particular I think it keeps the games alive too. Because the games are like; a new game is released, people play it and then it starts to decline a bit. And then at some point we release a new expansion and then it picks up speed. And the mods have a tendency to bridge those periods in between. People get tired of the games and before the next expansion comes, something else that is new comes during that time. – Scripter and researcher.

These findings are based on the development processes and practices of the case firm which, in several instances, had created products displaying these characteristics, and where it was able to successfully combine internal development with external innovation from users. In addition, the dissertation offers quantitative evidence of the platform characteristics of products that complement this qualitative evidence in answering the fourth research question. These data provide partial support for the positive effects on performance at the group level. The SEM analysis did not find a significant direct effect between the openness of products and their financial performance. It did, however, establish a positive link between the presence of platform characteristics of products and the speed of development projects, and an indirect effect on the products' financial performance via this mechanism. The fact that openness at the product level increases the speed of development is likely attributable to the focal firm being able to effectively source parts of development to user communities after the product has been launched. This does not necessarily mean that the product that is launched is unfinished or lacks features. Instead, what the product openness capability provides the firm is an external source of specialized need- and demand-related modular innovations that, when accumulating in number, add value to the product. While the firm creates and develops a product, openness and tools that enable user innovation give it an opportunity to focus less on these aspects and more on the core functionality and systems of the game. In support of this explanation, the case data show that the content created with users can be highly specialized and can rely on the narrow expertise and interests of users that may not be present as existing competence within the firm. Certain efforts by users that add value to the product may either not be possible or feasible to do internally due to this. Rather than doing what may require information outside its existing resource base, the firm leverages user communities and thereby saves development time. That development speed, in turn, is positive for product performance is established in previous research (Evanschitzky et al., 2012; Henard and Szymanski, 2001; Menon et al., 2002). In this context, the main factor is likely to be market advantages resulting from the timely releases of products, which avoid lagging behind rapid technical developments and ensuring a close fit between the products and shifting user needs.

Linking community sensing and product openness

The community sensing and product openness capabilities are distinct and separate concepts but the empirical findings in this dissertation also show that they are interlinked. Both community sensing and product openness are inherently related to the development of products and function complementary in development projects. The outcome of the community sensing capability is an identification and internalization of use-information, which allows the firm to identify emerging opportunities for product innovation both during and after product launch. The product openness capability, in turn, enables the creation of products that facilitate continuous development and management of external innovation.

As shown in Papers II and III, community sensing processes are related to product openness. The information and opportunities generated through community sensing feed into, and inform, the continuous development of the platformed product, which can be adapted to emergent change and user needs. For the firm's internal development, community sensing offers access to innovation-conducive information. Community sensing also indirectly affects the external innovation by users by providing the firm input and channels to identify needs related to openness in the product. Through adapting and further developing tools, selective revealing or offering support, the firm is able to manage openness and adapt the products platform characteristics to existing and emerging needs and demand of users. This is exemplified in the following quote from the case material in Paper II. Here one of the games that was initially designed to facilitate user innovation still had to be adapted further in response to increasing demand for modding support in the game's systems.

Here we have designed the game around modding, but we did not foresee the amount of mods and will probably have to rebuild quite a lot of interfaces and systems to... Or I should say, we have already begun rebuilding interfaces to adapt the game to the amount of mods that people use. – Brand Manager

A visualization of these interrelations is provided in Figure 7, also available in Paper II. This figure summarized the findings of the case study and shows key processes related to the capabilities applications as well as empirical examples.

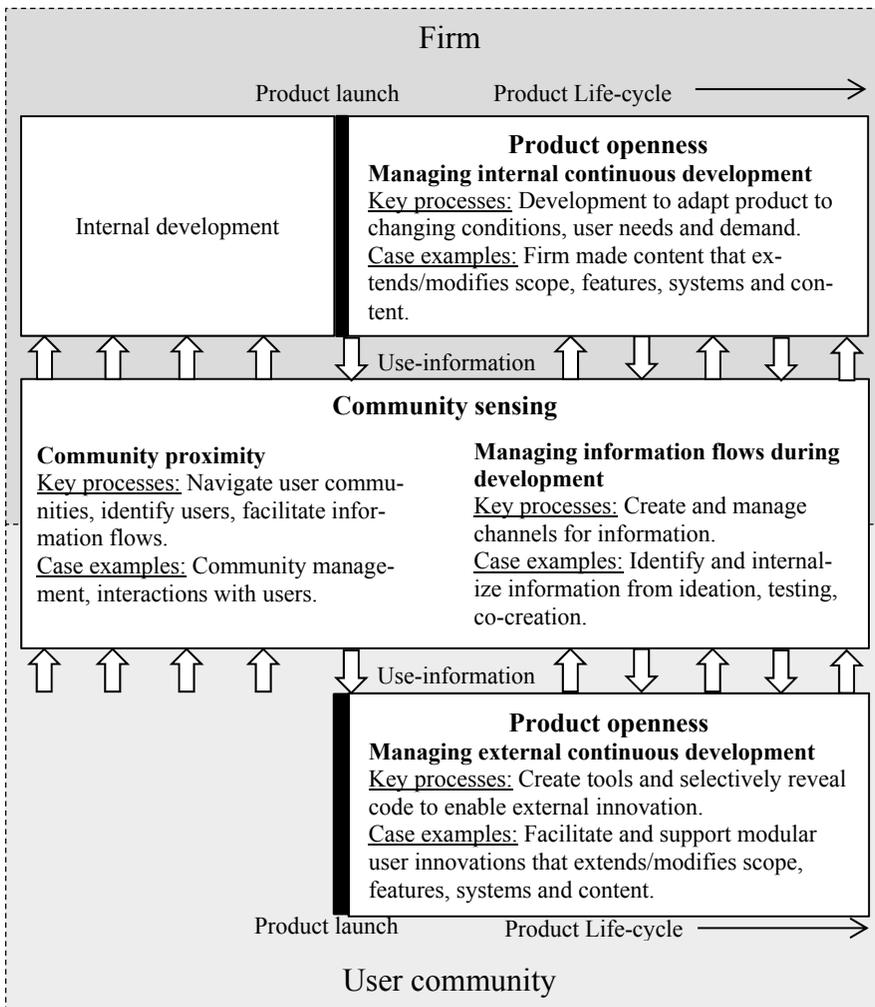


Figure 7. Conceptual model of community sensing and product openness

In terms of impacts of relationships between the central concepts in the dissertation, the main findings are summarized in Figure 5 (dotted lines indicate significant indirect effects). In the second chapter of this summary, Figure 2 showed an initial conceptualization of relationships between the central concepts that guided the empirical research in the dissertation. A comparison between Figures 2 and 5 demonstrates support for the overall theoretical argument, but also a more detailed picture where the capabilities positive impacts on performance are indirect rather than direct.

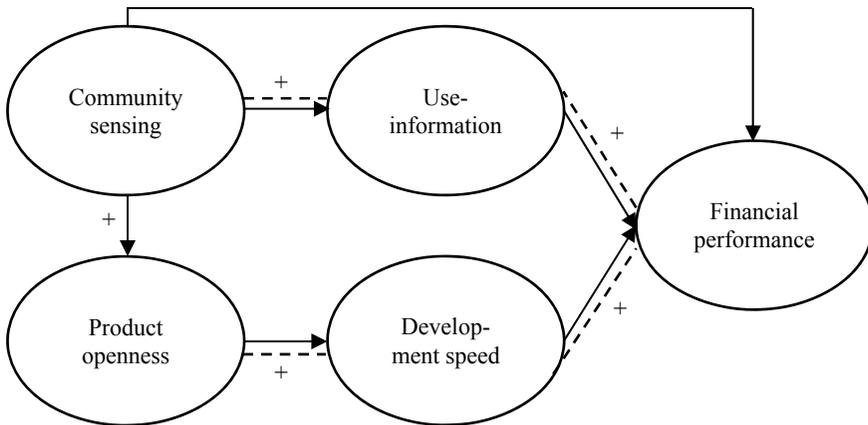


Figure 8. Summary of relationships

Theoretical contributions

In broad strokes, the dissertation contributes to the development and testing of theory on the management of DOI, which has been identified as an area in need of more work (Nambisan et al., 2017). More specifically, the dissertation adds to extant work on the management of openness to user communities that capitalize on and utilize processes made possible by digital innovation and digital technology to drive product innovation. By drawing on capability literatures, this research contributes to a dynamic capability perspective of OI (Chesbrough et al., 2018). The focus on user communities as sources of innovation-conducive information and innovation also contributes to knowledge gaps in OI on how firms can manage external user communities and crowds of intrinsically motivated users, and leverage them for innovation (Bogers et al., 2016; Chesbrough et al., 2018; Piller and West, 2014).

The dissertation draws on extant work on sensing capabilities in strategy and marketing (Day, 1994; Teece, 2007) and work on innovation with user communities (e.g., Burger-Helmchen and Cohendet, 2011; Jeppesen, 2004; Parmentier and Mangematin, 2014) to develop the community sensing capability concept. It also utilizes conceptualizations and principles of innovation platforms (e.g., Gawer and Cusumano, 2002; Meyer et al., 2017) and user innovation in the video game industry (e.g., Koch and Bierbamer, 2016; Parmentier and Gandia, 2013) to outline the product platform capability. By doing so, the research contributes to further integration and use of analogous theory in OI (Randhawa et al., 2016), in addition to answering calls for more

research at the intersection of open and digital innovation (Bogers et al., 2018; Nambisan et al., 2017).

The research in this dissertation also aligns with and adds to perspectives of OI processes as phenomena occurring at lower levels of analysis than the firm (Du et al., 2014; Salge et al., 2013; Thanasopon et al., 2016; Tranejekjer and Sondergaard, 2013; Vanhaverbeke et al., 2014). Openness to user communities primarily involves points of interaction and information flows in development and innovation projects. Investigating the application of capabilities to manage and leverage openness to communities at this level results in findings and theorizing that are more proximate to managerial practice than a firm-level perspective. The dissertation has examined community sensing capabilities as abilities of firms to leverage openness in individual innovation processes, and product openness capabilities as abilities to utilize openness at the product level. These dynamic capabilities are firm-level concepts, but their constituting processes reside on lower levels of analysis. By focusing empirically and analytically on individual projects and the processes underpinning and linking the two capabilities, the dissertation contributes to calls for more research on lower levels (Bogers et al., 2016; Randhawa et al., 2016) and specifically project levels of analysis in OI (Du et al., 2014; Felin and Zenger, 2014; Kim et al., 2015; West et al., 2014). While the literature review in Paper I showed that a substantial amount of research has been conducted at these levels, its results also point out a need for more research at the product level. Furthermore, it points to a need for more studies outlining performance outcomes and mechanisms, as well as studies looking quantitatively at the management and outcomes of leveraging external crowds and communities in OI.

The quantitative studies in Papers III and IV investigate an industry context that, to a significant extent, is made up of small and medium-sized firms. The findings from these papers thereby also make contributions that extend, and generalize to work on OI in SME contexts. SMEs often have a liability of smallness that impacts their innovation processes (Chesbrough, 2010). This type of firm can face challenges relating to a lack of internal resources and dedicated processes to identify and internalize external information. The two capabilities offer ways of managing OI processes for SMEs in digital innovation settings where users constitute a source of innovation. Through community sensing and product openness, the research in this dissertation puts forward theoretical concepts explaining how SMEs can overcome challenges in OI that may result from such liabilities. It aligns with previous assertions that inbound OI processes are beneficial for SMEs (Brunswick and Vanhaverbeke, 2015; Parida et al., 2012), in particular with market sources and users of its products (Ahn et al., 2015). OI can provide SMEs with access to external sources of information (Brunswick and Vanhaverbeke, 2015; van de Vrande, 2009) when their internal resources are limited (Wynarczyk et al., 2013). Previous research has also suggested that

SMEs with effective sensing and seizing capabilities (Teece, 2007) are better geared toward implementing OI (Grimaldi, Quinto and Rippa, 2013). The research in this dissertation corroborates this view.

Managerial implications

In addition to its implications for research, the work in this dissertation also has relevance for firms and managers seeking to build or develop DOI capabilities to utilize user communities for product innovation. In the following, normative implications based on the findings are outlined in relation to community sensing and product openness processes.

Applying community sensing

The empirical results show the positive effects of community sensing on product-level performance if the processes result in increased levels of information about user needs, demand and product use that can be applied to development work. Managers seeking to implement new sensing practices or improve existing ones must ensure that these actually result in a better understanding of users, emerging change and trends in demand—and that this understanding has an impact on development processes. Without this, sensing processes are likely to have little, if any, positive impact on the performance of products and product innovation. It should be stressed that it is not enough to have practices that result in identifying externally located information; managers must also build processes that internalize and enable acting on it in development. Qualitative evidence points to a need to foster a close proximity to users and user communities in order to develop and implement successful sensing processes. This proximity lets individuals in the firm understand and more efficiently and effectively navigate community settings, which can be complex and contain intricate social structures and sub-groups. Being able to more effectively sift through, search and elicit information from ongoing flows of information from user interactions, reactions, comments and discussions is a result of this proximity. In practice, designated community managers can be efficient gatekeepers and knowledge brokers for the firm. However, the findings also point to the benefits of encouraging other positions to also engage with the community to maintain a close proximity of development work to user communities. In addition, managers must also develop processes that allow effective inflows of information from users. In the video game industry, mobilizing user communities to contribute to ideation, provide feedback, and engage in testing of early versions of products as well as co-creation of certain content constitute concrete processes that can serve as channels for innovation-conducive infor-

mation. In other settings, managers could adapt these or develop equivalent processes to integrate community users into development processes.

Applying product openness

Through degrees of openness in products, managers can use platforming characteristics to facilitate external innovation that uses the product as a base. Coupling internal development with external innovation from users provides a complementarity with the potential to extend the product's lifespan considerably. The results from the research in this dissertation also indicate that designing and creating products with platform characteristics positively impacts the speed of development processes and the performance of products indirectly.

For managers looking to build or improve their firm's product openness capability, several aspects are important. First, the product should be at least partly digital. Second, while products that were originally developed closed can be opened through selective revealing of intellectual property, there may be benefits in developing products with platform characteristics from the onset. Doing so provides greater opportunities to decide what systems and features should be left open to users to change and add to. It also helps the firm to build tools for user innovation. Importantly, opening products and their continuous development to users necessarily shifts some of the control over development trajectories from the firm to users, as part of the locus of innovation also shifts. The retention or relinquishing of control will, to a large extent, be dependent on degrees of openness of the platformed product and what parts of the product users are able to modify. Management must thereby balance opportunities of giving users more freedom with remaining in control over the product. In this area, it is suggested that the core systems and features of the product remain closed so that the firm retains control over the identity of the product, but not all its content. It is further recommended that managers tailor the degree of openness to the type of users of their particular product. Different user communities display differing characteristics in addition to internal heterogeneity. As a result, it is likely that different degrees of openness are suitable for different demographics—and, in addition, that different tools facilitating user innovation are appropriate for different users. Here, a close proximity to the user community will help managers to navigate and adjust these parameters.

Implications for future research

The two dynamic capabilities, community sensing and product openness, constitute novel concepts, and although grounded in previous research, provide the opportunity for additional research. It is of interest to further exam-

ine community sensing and product openness at the level of development projects. This can be done either through multiple-case or quantitative research in order to validate and/or identify additional sensing and product openness processes, along with possible reasons for heterogeneity among firms possessing these capabilities. It is also of interest to further examine performance and value outcomes of the two capabilities. The results from this dissertation point to an interrelation between community sensing and platform capabilities and indirect performance effects at the level of product development projects. Future research could investigate additional contingencies of these relationships and indirect effects. In particular, product-level heterogeneity, such as product genres or demographics, structure and composition of user communities, could be variables of interest. User communities are made up of sub-groups with varying interest, skill and knowledge levels and also differ between games (Burger-Helmchen and Cohendet, 2011). Interesting research opportunities exist in the examination of matching and combining different openness and management practices with different parts of communities and user types.

It is also of interest to test the capabilities against other forms of performance, given performance's multi-dimensional nature (Katsikeas et al., 2016). Previous research has, for example, linked openness in products to users' value perceptions (Koch and Bierbamer, 2016). Of particular interest are studies using longitudinal quantitative performance measures able to capture the effects of the continuous development of products enabled by community sensing and product openness. The qualitative evidence in Paper II demonstrates such prolonged performance effects over several years.

Furthermore, this dissertation has focused on two specific dynamic capabilities to manage DOI with user communities, and opportunities exist in examining these in relation to other capabilities important to digital product innovation. In particular, investigating community sensing and the more technology-oriented absorptive capacity concept (Cohen and Levinthal, 1990) could be of interest and importance to OI research. Community sensing capabilities are geared toward generating opportunities for development from information located with and concerning users and their existing and latent needs and demand. Absorptive capacity, in comparison, is focused more on the ability to, from previous knowledge, assimilate and exploit emergent technological change and new knowledge (Cohen and Levinthal, 1990). Examining simultaneous mobilization and potential complementarities between these capabilities in innovation processes constitutes a particularly interesting area of research. For product innovation and development, these two capabilities in a sense represent the technology and use sides and are, in OI, both important aspects for the development of successful products.

Future studies could also investigate both the prevalence and the applicability of the community sensing and product openness capabilities in other

settings than the video game industry. Given the particularities of the video game industry as an empirical context, it is suitable for this purpose to briefly address aspects relevant for the generalizability of the empirical findings to other sectors and industries. Digital innovation is pervasive across settings, and its implications for innovation management are far-reaching (Yoo et al., 2012). It is, however, possible to point out certain conditions of the contexts where the findings of this dissertation are likely to be most applicable and valid. First, an enabling condition for the involvement of users and the information transfer that occurs between dispersed users and the firm is an innovation process that is at least partly digital. While not a strict requirement, digital innovation processes help modularization and the transfer of both information about the developed product and parts, or the whole, of the product itself (Nambisan et al., 2017). This facilitates openness in the innovation process necessary for effective community sensing in addition to the potential of distributed innovation. Second, the product being developed must also be at least partly digital to fully take advantage of the platforming aspects of product openness that enable the continuous internal and external development of products. The product openness capability will be most effective for products displaying the malleable and dynamic characteristics of digital innovations (Zittrain, 2006) which allow them to be developed over time by a dispersed set of actors. Similar to the first condition, this is a soft requirement that functions as a significant facilitator, but not a strict prerequisite, of OI processes and the creation and management of platformed products. Both community sensing and product openness processes can be applied in non-digital settings, but here they are likely to be much less effective and valuable to the firm. The third and last condition of contexts to which the findings generalize is the presence of users with the propensity and ability to contribute to product innovation. Digital innovation facilitates the integration of large groups and crowds in OI processes (Boudreau and Lakhani, 2013; Schweitzer et al., 2012), and a fundamental strength of both community sensing and product openness is the utilization of groups of users. But for these capabilities to be effective, sufficient numbers of motivated users with knowledge and information relevant to product innovation must be present. In the video game industry, users are motivated to contribute mainly due to intrinsic motivations (Wiertz and de Ruyter, 2007). In other settings, extrinsic, or a mix of intrinsic and extrinsic motivators, may be suitable motivators (Belenzon and Shankerman, 2015; Seidel and Langner, 2015). What constitutes a sufficient number of users for community sensing and product openness will also likely be highly context-dependent. But it is reasonable to expect that the two capabilities will be more effective in the presence of larger crowds.

Conclusions

This dissertation has studied the capabilities of video game firms to leverage external user communities for product innovation in an innovation landscape characterized by DOI. This landscape is seeing increasingly open and digital innovation processes as digital technology becomes pervasive to business, and firms, to a greater extent than ever, need to look outside their boundaries to innovate. While this environment presents challenges in managing product innovation processes, it also offers opportunities for firms to involve external users at an unprecedented scale in innovation. But to act on these opportunities, firms need effective capabilities to manage DOI with users and user communities. To this end, the dissertation put forward the community sensing and product openness concepts by integrating previous work in innovation management and management literatures. The research in this dissertation has qualitatively and quantitatively investigated these capabilities at the innovation process and product levels. It has examined their effects on performance as outcomes of development projects in the video game industry. The dissertation contributes to OI by investigating innovation with intrinsically motivated users in addition to its management and value mechanisms (Bogers et al., 2016; Chesbrough et al., 2018; Piller and West, 2014). It also adds to research emphasizing the lower-level perspectives of OI (Du et al., 2014; Salge et al., 2013; Thanasopon et al., 2016; Tranejekjer and Sondergaard, 2013; Vanhaverbeke et al., 2014) and the integration of existing and analogous theory (Randhawa et al., 2016). A contribution is also made to capability literatures by extending previous concepts in marketing and strategy research. In its totality, the work in this research effort contributes at the intersection of open and digital innovation by investigating dynamic capabilities to manage DOI with user communities in a new innovation landscape.

References

- Ahn, J. M., Minshall, T., & Mortara, L. 2015. Open innovation: a new classification and its impact on firm performance in innovative SMEs. *Journal of Innovation Management*, 3(2): 33-54.
- Allen, T. J. 1977. *Managing the flow of information: Technology transfer and the dissemination of technological information within the R and D organization*. Cambridge, Massachusetts: The MIT Press.
- Arakji, R. Y., & Lang, K. R. 2007. Digital consumer networks and producer-consumer collaboration: Innovation and product development in the video game industry. *Journal of Management Information Systems*, 24(2): 195–219.
- Arend, R. J. 2014. Entrepreneurship and dynamic capabilities: how firm age and size affect the ‘capability enhancement-SME performance’ relationship. *Small Business Economics*, 42(1): 33-57.
- Asakawa, K., Nakamura, H., & Sawada, N. 2010. Firms’ open innovation policies, laboratories’ external collaborations, and laboratories’ R&D performance. *R&D Management*, 40(2): 109–123.
- Baldwin, C., & von Hippel, E. 2011. Modeling a paradigm shift: From producer innovation to user and open collaborative innovation. *Organization Science*, 22(6): 1399–1417.
- Baretto, I. 2010. Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management*. 36(1): 256-280.
- Belenzon, S., & Schankerman, M. 2015. Motivation and sorting of human capital in open innovation. *Strategic Management Journal*, 36(6): 795–820.
- Bianchi, M., Campodall’Orto, S., Frattini, F., & Vercesi, P. 2010. Enabling open innovation in small- and medium-sized enterprises: how to find alternative applications for your technologies. *R&D Management*, 40(4): 414–431.
- Bogers, M., Chesbrough, H., & Moedas, C. 2018. Open innovation: research, practices, and policies. *California Management Review*, 60(2): 5–16.
- Bogers, M., Zobel, A.-K., Afuah, A., Almirall, E., Brunswicker, S., et al. 2017. The open innovation research landscape: established perspectives and emerging themes across different levels of analysis. *Industry and Innovation*, 24(1): 8–40.
- Borch, O. J., & Madsen, E. L. 2007. Dynamic capabilities facilitating innovative strategies in SMEs. *International Journal of Technoentrepreneurship*, 1(1): 109.
- Boudreau, K. 2010. Open platform strategies and innovation: Granting access vs. devolving control. *Management Science*, 56(10): 1849–1872.
- Boudreau, K., & Lakhani, K. 2009. How to manage outside innovation. *MIT Sloan Management Review*, 50(4): 69.
- Boudreau, K. J., & Lakhani, K. R. 2013. Using the crowd as an innovation partner. *Harvard Business Review*, 91(4): 60–69.

- Brunswick, S., & Vanhaverbeke, W. 2015. Open innovation in small and medium-sized enterprises (SMEs): External knowledge sourcing strategies and internal organizational facilitators. *Journal of Small Business Management*, 53(4): 1241–1263.
- Buganza, T., & Verganti, R. 2006. Life-cycle flexibility: How to measure and improve the innovative capability in turbulent environments. *Journal of Product Innovation Management*, 23(5): 393–407.
- Burger-Helmchen, T., & Cohendet, P. 2011. User communities and social software in the video game industry. *Long Range Planning*, 44(5–6): 317–343.
- Chatenier, E. du, Verstege, J., Biemans, H., Mulder, M., & Omta, O. 2010. Identification of competencies for professionals in open innovation teams: Identification of competencies for professionals. *R&D Management*, 40(3): 271–280.
- Chesbrough, H. W. 2003. *Open innovation: The new imperative for creating and profiting from technology*. Boston, Massachusetts: Harvard Business School Press.
- Chesbrough, H. W. 2006. *Open business models: How to thrive in the new innovation landscape*. Boston, Massachusetts: Harvard Business School Press.
- Chesbrough, H. W. 2010. How smaller companies can benefit from open innovation. *Economy, Culture & History Japan Spotlight Bimonthly*, 29 (13): 13-15.
- Chesbrough, H. W., Bogers, M. 2014. Explicating open innovation: Clarifying an emerging paradigm for understanding innovation. In Chesbrough, H. W., Vanhaverbeke, W. and West, J. (Eds), *New frontiers in open innovation*: 3–29. Oxford: Oxford University Press.
- Chesbrough, H., Lettl, C., & Ritter, T. 2018. Value creation and value capture in open innovation. *Journal of Product Innovation Management*, 35(6): 930–938.
- Chiang, Y.-H., & Hung, K.-P. 2010. Exploring open search strategies and perceived innovation performance from the perspective of inter-organizational knowledge flows. *R&D Management*, 40(3): 292–299.
- Cohen, W. M., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1): 128.
- Coleman, J. S. 1990. *Foundations of social theory*. Cambridge: Harvard University Press.
- Cooper, R. G. 2009. How companies are reinventing their idea-to-launch methodologies. *Research-Technology Management*, 52(2): 47–57.
- Corner, P. D., & Wu, S. 2012. Dynamic capability emergence in the venture creation process. *International Small Business Journal*, 30(2): 138–160.
- Cova, B., & Pace, S. 2006. Brand community of convenience products: new forms of customer empowerment – the case “my Nutella The Community.” *European Journal of Marketing*, 40(9/10): 1087–1105.
- Cusumano, M. A., & Gawer, A. 2003. The elements of platform leadership. *IEEE Engineering Management Review*, 31(1): 8–8.
- Dahlander, L., & Frederiksen, L. 2012. The core and cosmopolitans: A relational view of innovation in user communities. *Organization Science*, 23(4): 988–1007.
- Dahlander, L., & Gann, D. M. 2010. How open is innovation? *Research Policy*, 39(6): 699–709.
- Dahlander, L., & Magnusson, M. G. 2005. Relationships between open source software companies and communities: Observations from Nordic firms. *Research Policy*, 34(4): 481–493.
- Day, G. S. 1994. The capabilities of market-driven organizations. *Journal of Marketing*, 58(4): 37.

- Deng, X. N, Joshi, K. D. & Galliers, R. D. 2016. The duality of empowerment and marginalization in microtask crowdsourcing: Giving voice to the less powerful through value sensitive design. *MIS Quarterly*, 40(2): 279–302.
- Dong, A., Garbuio, M., & Lovallo, D. 2016a. Generative sensing in design evaluation. *Design Studies*, 45: 68–91.
- Dong, A., Garbuio, M., & Lovallo, D. 2016b. Generative sensing: A design perspective on the microfoundations of sensing capabilities. *California Management Review*, 58(4): 97–117.
- Dong, J. Q. and Netten, J. 2017. Information technology and external search in the open innovation age: New findings from Germany. *Technological Forecasting and Social Change*, 120(1): 223-231.
- Doty, D. H. & Glick W. H. 1998. Common methods bias: Does common methods variance really bias results? *Organizational Research Methods*, 1(4): 374-406.
- Du, J., Leten, B., & Vanhaverbeke, W. 2014. Managing open innovation projects with science-based and market-based partners. *Research Policy*, 43(5): 828–840.
- Du, R. Y. & Kamakura W. A 2012. Quantitative Trendspotting. *Journal of Marketing Research*, 49(4): 514-536.
- Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10/11,): 1105–1121.
- Elmquist, M., Fredberg, T., & Ollila, S. 2009. Exploring the field of open innovation. *European Journal of Innovation Management*, 12(3): 326–345.
- ESA 2018. *Essential facts about the computer video game industry*. <http://www.theesa.com/wp-content/uploads/2018/05/EF2018_FINAL.pdf> Viewed 1 December 2018.
- Evanschitzky, H., Eisend, M., Calantone, R. J., & Jiang, Y. 2012. Success factors of product innovation: An updated meta-analysis. *Journal of Product Innovation Management*, 29: 21–37.
- Fang, E. 2008. Customer participation and the trade-off between new product innovativeness and speed to market. *Journal of Marketing*, 72(4): 90-104.
- Felin, T., Foss, N. & Ployhart, R. 2015. The microfoundations movement in strategy and organization Theory. *The Academy of Management Annals*, 9(1): 575–632.
- Felin, T., & Zenger, T. R. 2014. Closed or open innovation? Problem solving and the governance choice. *Research Policy*, 43(5): 914–925.
- Flowers, S. 2008. Harnessing the hackers: The emergence and exploitation of outlaw Innovation. *Research Policy*, 37(2): 177–193.
- Foley, A., & Fahy, J. 2004. Towards a further understanding of the development of market orientation in the firm: a conceptual framework based on the market-sensing capability. *Journal of Strategic Marketing*, 12(4): 219–230.
- Foley, A., & Fahy, J. 2009. Seeing market orientation through a capabilities lens. *European Journal of Marketing*, 43(1/2): 13–20.
- Franke, N., Keinz, P., & Klausberger, K. 2013. “Does this sound like a fair deal?”: Antecedents and consequences of fairness expectations in the individual’s decision to participate in firm innovation. *Organization Science*, 24(5): 1495–1516.
- Franke, N., & Shah, S. 2003. How communities support innovative activities: an exploration of assistance and sharing among end-users. *Research Policy*, 32(1): 157–178.
- Franzoni, C., & Sauermaun, H. 2014. Crowd science: The organization of scientific research in open collaborative projects. *Research Policy*, 43(1): 1–20.

- Frey, K., Lüthje, C., & Haag, S. 2011. Whom should firms attract to open innovation platforms? The role of knowledge diversity and motivation. *Long Range Planning*, 44(5–6): 397–420.
- Friedman, Y., Carmeli, A. & Tishler A. 2016. How CEOs and TMT build adaptive capacity in small entrepreneurial firms. *Journal of Management Studies*, 53(6): 996-1018.
- Füller, J., Jawecki, G., & Mühlbacher, H. 2007. Innovation creation by online basketball communities. *Journal of Business Research*, 60(1): 60–71.
- Gandhi, P., Khanna, S. and Ramaswamy S. 2016. Which industries are the most digital (and why)? *Harvard Business Review*, April, 01.
- Ganley, D., & Lampe, C. 2009. The ties that bind: Social network principles in online communities. *Decision Support Systems*, 47(3): 266–274.
- Garcia Martinez, M. 2017. Inspiring crowdsourcing communities to create novel solutions: Competition design and the mediating role of trust. *Technological Forecasting and Social Change*, 117: 296–304.
- Gassman, O. and Enkel, E. 2004. **Towards a theory of open innovation: Three core process archetypes**. Proceedings of the R&D Management Conference, Lisbon, Portugal, July 6–9.
- Gassmann, O., Enkel, E., & Chesbrough, H. 2010. The future of open innovation. *R&D Management*, 40(3): 213–221.
- Gassmann, O., Sandmeier, P., & Wecht, C. H. 2006. Extreme customer innovation in the front-end: learning from a new software paradigm. *International Journal of Technology Management*, 33(1): 46.
- Gawer, A., & Cusumano, M. A. 2014. Industry platforms and ecosystem innovation: Platforms and innovation. *Journal of Product Innovation Management*, 31(3): 417–433.
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. 2013. Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, 16(1): 15–31.
- Greco, M., Grimaldi, M., & Cricelli, L. 2015. Open innovation actions and innovation performance: A literature review of European empirical evidence. *European Journal of Innovation Management*, 18(2): 150–171.
- Grimaldi, M., Quinto, I. & Rippa P. 2013. Enabling open innovation in small and medium enterprises: a dynamic capabilities approach, *Knowledge and Process Management*, 20(4):199-210.
- Haas, M. R. 2010. The double-edged swords of autonomy and external knowledge: Analyzing team effectiveness in a multinational organization. *Academy of Management Journal*, 53(5): 989–1008.
- Haefliger, S., Jäger, P., & von Krogh, G. 2010. Under the radar: Industry entry by user entrepreneurs. *Research Policy*, 39(9): 1198–1213.
- Hau, Y. S., & Kim, Y.-G. 2011. Why would online gamers share their innovation-conducive knowledge in the online game user community? Integrating individual motivations and social capital perspectives. *Computers in Human Behavior*, 27(2): 956–970.
- Helfat C. E., Finkelstein S., Mitchell W., Peteraf, M.A., Singh, H., Teece, D. J., Winter, S.G. 2007. *Dynamic Capabilities: Understanding Strategic Change in Organizations*. Blackwell: Oxford, U.K.
- Helfat, C. E., & Martin, J.A. 2015. Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change. *Journal of Management*, 41(5): 1281-1312.

- Helfat, C. E., & Peteraf, M.A. 2015. Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal*, 36(6): 831-850.
- Helfat, C. E., & Winter, S. G. 2011. Untangling dynamic and operational capabilities: Strategy for the (n)ever changing world. *Strategic Management Journal*, 32(11): 1243-1250.
- Henard, D. H., & Szymanski, D. M. 2001. Why some new products are more successful than others. *Journal of Marketing Research*, 38(3): 362-375.
- Henkel, J. 2006. Selective revealing in open innovation processes: The case of embedded Linux. *Research Policy*, 35(7): 953-969.
- Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. 2007. Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of Management Journal*, 50(6): 1385-1399.
- Hmieleski, K. M. & Corbett, A. C. 2006. Proclivity for improvisation as a predictor of entrepreneurial intentions. *Journal of Small Business Management*, 44(1): 45-63.
- Hobday, M. 2000. The project-based organisation: an ideal form for managing complex products and systems? *Research Policy*, 29(7-8): 871-893.
- Hui, G. 2014. How the internet of things changes business models, *Harvard Business Review*, July 29.
- Huizingh, E. K. R. E. 2011. Open innovation: State of the art and future perspectives. *Technovation*, 31(1): 2-9.
- Trantopoulos, K., von Krogh, G., Wallin, M. W., & Woerter, M. 2017. External knowledge and information technology: Implications for process innovation performance. *MIS Quarterly*, 41(1): 287-300.
- Jeppesen, L. B. 2005. User toolkits for innovation: Consumers support each other. *Journal of Product Innovation Management*, 22(4): 347-362.
- Jeppesen, L. B. 2004. Profiting from innovative user communities. *IVS/CBS working papers*, Department of Industrial Economics and Strategy, Copenhagen Business School.
- Jeppesen, L. B., & Frederiksen, L. 2006. Why do users contribute to firm-hosted user communities? The case of computer-controlled music instruments. *Organization Science*, 17(1): 45-63.
- Jeppesen, L. B., & Laursen, K. 2009. The role of lead users in knowledge sharing. *Research Policy*, 38(10): 1582-1589.
- Jeppesen, L. B., & Molin, M. J. 2003. Consumers as co-developers: Learning and innovation outside the firm. *Technology Analysis & Strategic Management*, 15(3): 363-383.
- Katkalo, V. S., Pitelis, C. N., & Teece, D. J. 2010. Introduction: On the nature and scope of dynamic capabilities. *Industrial and Corporate Change*, 19(4): 1175-1186.
- Katsikeas, C. S., Morgan, N. A., Leonidou, L. C., & Hult, G. T. M. 2016. Assessing performance outcomes in marketing. *Journal of Marketing*, 80(2): 1-20.
- Kim, N., Kim, D.-J., & Lee, S. 2015. Antecedents of open innovation at the project level: empirical analysis of Korean firms. *R&D Management*, 45(5): 411-439.
- Knudsen, M. P., & Mortensen, T. B., 2011. Some immediate – but negative – effects of openness on product development performance. *Technovation*, 31(1): 54-64.
- Koch, S., & Bierbamer, M. 2016. Opening your product: impact of user innovations and their distribution platform on video game success. *Electronic Markets*, 26(4): 357-368.
- Kroon, J. 2017. *Spelutvecklarindex 2017*. Stockholm, <
<https://static1.squarespace.com/sttic/5a61edb7a803bb7a65252b2d/t/5ab0eb5e0e>

- 2e72e81603f574/1521544060108/spelutvecklarindex+2017.pdf>. Viewed 1 December 2018.
- Langlois, R. N., & Garzarelli, G. 2008. Of Hackers and hairdressers: Modularity and the organizational economics of open-source collaboration. *Industry and Innovation*, 15(2): 125–143.
- Laursen, K., & Salter, A. 2006. Open for innovation: The role of openness in explaining innovation performance among U.K. manufacturing firms. *Strategic Management Journal*, 27(2): 131–150.
- Li, S., Shang, J., & Slaughter, S. A. 2010. Why do software firms fail? Capabilities, competitive actions, and firm survival in the software industry from 1995 to 2007. *Information Systems Research*, 21(3): 631–654.
- Liao, J. (Jon), Kickul, J. R., & Ma, H. 2009. Organizational dynamic capability and innovation: An empirical examination of internet firms. *Journal of Small Business Management*, 47(3): 263–286.
- Lyytinen, K., Yoo, Y., & Boland Jr., R. J. 2016. Digital product innovation within four classes of innovation networks. *Information Systems Journal*, 26(1): 47–75.
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, 58, 593–614.
- Magnusson, M., & Pasche, M. 2014. A contingency-based approach to the use of product platforms and modules in new product development. *Journal of Product Innovation Management*, 31(3): 434–450.
- Makadok, R. 2001. Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal*, 22(5): 387–401.
- Malinen, S. 2015. Understanding user participation in online communities: A systematic literature review of empirical studies. *Computers in Human Behavior*, 46: 228–238.
- March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science*, 2(1): 71–87.
- Mathiassen, L., & Vainio A. M. 2007. Dynamic capabilities in small software firms: A sense-and-respond approach. *IEEE Transactions on Engineering Management*, 54(3):522-538.
- Menon, A., Chowdhury, J., & Lukas, B. A. 2002. Antecedents and outcomes of new product development speed: An interdisciplinary conceptual framework. *Industrial Marketing Management*, 31: 317-328.
- Meyer, M. H., Osiyevskyy, O., Libaers, D., & van Hugten, M. 2018. Does product openness pay off? *Journal of Product Innovation Management*, 35(1): 66–87.
- Moorman, C. & Miner, A. S. 1998. The convergence of planning and execution: Improvisation in new product development. *Journal of Management*, 61: 1-20.
- Mu, J. 2015. Marketing capability, organizational adaptation and new product development performance. *Industrial Marketing Management*, 49: 151–166.
- Müller-Seitz, G., & Reger, G. 2010. Networking beyond the software code? an explorative examination of the development of an open source car project. *Technovation*, 30(11–12): 627–634.
- Nambisan, S., & Baron, R. A. 2007. Interactions in virtual customer environments: Implications for product support and customer relationship management. *Journal of Interactive Marketing*, 21(2): 42–62.
- Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M. 2017. Digital Innovation Management: Reinventing innovation management research in a digital world. *Mis Quarterly*, 41(1).

- Nambisan S. & Sawhney, M. 2011. Orchestration processes in network-centric innovation: Evidence from the field. *Academy of Management Perspectives*, 25(3): 40-57.
- Newzoo, 2018. *2018 Global games market report*. <https://storage.pardot.com/296652/52511/Newzoo_2018_Global_Games_Market_Report.pdf> Viewed 1 December 2018.
- Ngo, L. V., Bucic, T., Sinha, A., & Lu, V. N. 2019. Effective sense-and-respond strategies: Mediating roles of exploratory and exploitative innovation. *Journal of Business Research*, 94: 154–161.
- Nylander, J. 2018. *Spelutvecklarindex 2018*. Stockholm, <https://static1.squarespace.com/static/5a61edb7a803bb7a65252b2d/t/5bc094a5e2c4835e820f75b3/1539347665847/GDI_2018_SVE+2.0.pdf>. Viewed 1 December 2018.
- Olavarrieta, S., & Friedmann, R. 2008. Market orientation, knowledge-related resources and firm performance. *Journal of Business Research*, 61(6): 623–630.
- Ollila, S., & Yström, A. 2017. An investigation into the roles of open innovation collaboration managers: Open innovation collaboration managers. *R&D Management*, 47(2): 236–252.
- Parida, V., Westerberg, M., & Frishammar, J. 2012. Inbound open innovation activities in high-tech SMEs: The impact on innovation performance. *Journal of Small Business Management*, 50(2): 283–309.
- Parker G, Van Alstyne, M., & Jiang, X. 2017. Platform ecosystems: How developers invert the firm. *MIS Quarterly*. 41(1): 255-266.
- Parker G, Van Alstyne, M., & Choudary, S. P. 2016. *Platform Revolution: How Networked Markets Are Transforming the Economy and How to Make Them Work for You*. New York, W. W. Norton.
- Parmentier, G., & Gandia, R. 2013. Managing sustainable innovation with a user community toolkit: The case of the video game Trackmania. *Creativity and Innovation Management*, 22(2): 195–208.
- Parmentier, G., & Mangematin, V. 2014. Orchestrating innovation with user communities in the creative industries. *Technological Forecasting and Social Change*, 83: 40–53.
- Pavlou, P. A. & El Sawy, O. A. 2011. Understanding the elusive black box of dynamic capabilities. *Decision Sciences*, 42(1): 239-273.
- Penrose, E. T. 1959. *The theory of the growth of the firm*. New York: John Wiley
- Piezunka, H., & Dahlander, L. 2015. Distant search, narrow attention: How crowding alters organizations' filtering of suggestions in crowdsourcing. *Academy of Management Journal*, 58(3): 856–880.
- Piller, F. T., & Walcher, D. 2006. Toolkits for idea competitions: a novel method to integrate users in new product development. *R&D Management*, 36(3): 307–318.
- Piller, F. and West, J. 2014. Firms, users and innovation: An interactive model of coupled open innovation. In Chesbrough, H. W, Vanhaverbeke, W. and West, J. (Eds), *New frontiers in open innovation*: 29-49. Oxford: Oxford University Press.
- Piva, E., Rentocchini, F., & Rossi-Lamastra, C. 2012. Is open source software about innovation? Collaborations with the open source community and innovation performance of software entrepreneurial ventures. *Journal of Small Business Management*, 50(2): 340–364.
- Plant, R. 2004. Online communities. *Technology in Society*, 26(1): 51–65.

- Podsakoff, P. M., MacKenzie, S. B. & Podsakoff, N. P. 2012. Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63: 539-569.
- Poetz, M. K., & Schreier, M. 2012. The value of crowdsourcing: Can users really compete with professionals in generating new product ideas? *Journal of Product Innovation Management*, 29(2): 245–256.
- Porter M. E. 1979. How competitive forces shape strategy. *Harvard Business Review*. 57(2): 137-145.
- Postigo, H. 2007. Of mods and modders: Chasing down the value of fan-based digital game modifications. *Games and Culture*, 2(4): 300–313.
- Priem, R. L. & Butler, J. E. 2001. Is the resource-based “view” a useful perspective for strategic management research? *Academy of Management Review*, 26(1): 22-40.
- PwC. 2018. *Global top 100 companies by market capitalization*. <<https://www.pwc.com/gx/en/audit-services/assets/pdf/global-top-100-companies-2018-report.pdf>>. Viewed 11 November 2018.
- Randhawa, K., Wilden, R., & Hohberger, J. 2016. A bibliometric review of open innovation: Setting a research agenda. *Journal of Product Innovation Management*, 33(6): 750–772.
- Readman, J., & Grantham, A. 2006. Shopping for buyers of product development expertise: *European Management Journal*, 24(4): 256–269.
- Remneland Wikhamn, B., & Wikhamn, W. 2013. Structuring of the open innovation field. *Journal of Technology Management & Innovation*, 8(3): 31–32.
- Roberts, E. B. 2007. Managing invention and innovation. *Research-Technology Management*, 50(1): 35-54.
- Rousseau, D. M. 1985. Issues of level in organizational research: Multi-level and cross-level perspectives. *Research in Organizational behavior*, 7: 1-37.
- Salge, T. O., Farchi, T., Barrett, M. I., & Dopson, S. 2013. When does search openness really matter? A contingency study of health-care innovation projects. *Journal of Product Innovation Management*, 30(4): 659–676.
- Schemann, B., Herrman, A. M., Chappin, M. H., & Heimeriks, G. J. 2016. Crowdsourcing ideas: Involving ordinary users in the ideation phase of new product development. *Research Policy*, 45(6): 1145-1154.
- Schilke, O., Hu, S., & Helfat, C. E. 2018. Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research. *Academy of Management Annals*, 12(1): 390–439.
- Schroll, A., & Mild, A. 2012. A critical review of empirical research on open innovation adoption. *Journal Für Betriebswirtschaft*, 62(2): 85–118.
- Schulz, C., & Wagner, S. 2008. Outlaw community innovation. *International Journal of Innovation Management*, 12(3):399-418.
- Schumpeter, J. A. 1934. *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Schweitzer, F. M., Buchinger, W., Gassmann, O., & Obrist, M. 2012. Crowdsourcing: leveraging innovation through online idea competitions. *Research-Technology Management*, 55(3): 32–38.
- See, L., Fritz, S., Perger, C., Schill, C., McCallum, I., et al. 2015. Harnessing the power of volunteers, the internet and Google Earth to collect and validate global spatial information using Geo-Wiki. *Technological Forecasting and Social Change*, 98: 324–335.
- Seidel, V. P., & Langer B. 2015. Using an online community for vehicle design: project variety and motivations to participate. *Industrial and Corporate Change*, 24(3): 635-653.

- Shenhar, A. J., and D. Dvir. 2007. *Reinventing project management: The diamond approach to successful growth and innovation*. Boston, MA: Harvard Business School Press.
- Simmering, M. J., Fuller, C. M., Richardson, H. A., Ocal, Y. & Atinc, G. M. 2014. Marker variable choice, reporting, and interpreting in the detection of common method variance: A review and demonstration. *Organizational Research Methods*, 18(3): 1-39.
- Sok, P., O’Cass, A., & Sok, K. M. 2013. Achieving superior SME performance: Overarching role of marketing, innovation, and learning capabilities. *Australian Marketing Journal*, 21(3): 161–167.
- Sydow, J., Lindkvist, L., & DeFillippi, R. 2004. Project-based organizations, embeddedness and repositories of knowledge: Editorial. *Organization Studies*, 25(9): 1475–1489.
- Taheri, M., & van Geenhuizen, M. 2016. Teams’ boundary-spanning capacity at university: Performance of technology projects in commercialization. *Technological Forecasting and Social Change*, 111: 31–43.
- Teece, D. J. 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13): 1319–1350.
- Teece, D. J. 2017. Dynamic capabilities and (digital) platform lifecycles. In J. Furman, A. Gawer, B. S. Silverman, & S. Stern (Eds.), *Advances in Strategic Management*, 37: 211–225.
- Teece, D. J., & Linden, G. 2017. Business models, value capture, and the digital enterprise. *Journal of Organization Design*, 6(1).
- Thanasopon, B., Papadopoulos, T., & Vidgen, R. 2016. The role of openness in the fuzzy front-end of service innovation. *Technovation*, 47: 32–46.
- Thomas, L. D. W., Autio, E., & Gann, D. M. 2014. Architectural leverage: Putting platforms in context. *Academy of Management Perspectives*, 28(2): 198–219.
- Tiwana, A., Konsynski, B., & Bush, A. A. 2010. Research commentary —Platform evolution: Coevolution of platform architecture, governance, and environmental dynamics. *Information Systems Research*, 21(4): 675–687.
- Tranekjer, T. L., & Søndergaard, H. A. 2013. Sources of innovation, their combinations and strengths - benefits at the NPD project level. *International Journal of Technology Management*, 61(3/4): 205.
- Tranfield, D., Denyer, D., & Smart, P. 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3): 207–222.
- Trott, P. (2012). *Innovation management and new product development* (5th ed.). Harlow, England: FT/Prentice Hall.
- Tschang, F. T. 2007. Balancing the tensions between rationalization and creativity in the video games industry. *Organization Science*, 18(6): 989–1005.
- van de Vrande, V., de Jong, J. P., Vanhaverbeke, W., & de Rochemont, M. 2009. Open innovation in SMEs: Trends, motives and management challenges. *Technovation*, 29(6–7): 423–437.
- Vanhaverbeke, W., Du, J., Leten, B. and Aalders, F. 2014. Exploring open innovation at the level of R&D projects. In Chesbrough, H. W, Vanhaverbeke, W. and West, J. (Eds) *New frontiers in open innovation*: 115-131. Oxford: Oxford University Press.
- von Hippel, E. 1986. Lead users: A source of novel product concepts. *Management Science*. 32(7): 791-805
- West, J. 2003. How open is open enough? *Research Policy*, 32(7): 1259–1285.

- West, J., & Bogers, M. 2014. Leveraging external sources of innovation: A review of research on open innovation. *Journal of Product Innovation Management*, 31(4): 814–831.
- West, J., & O'Mahony S. 2008. The role of participation architecture in growing sponsored open source communities. *Industry & Innovation*, 15(2): 145-168.
- West, J., & Kuk, G. 2016. The complementarity of openness: How AkerBot leveraged Thingiverse in 3D printing. *Technological Forecasting and Social Change*, 102: 169–181.
- West, J., & Lakhani, K. R. 2008. Getting clear about communities in open innovation. *Industry and Innovation*, 15(2): 223–231.
- West, J., Salter, A., Vanhaverbeke, W., & Chesbrough, H. 2014. Open innovation: The next decade. *Research Policy*, 43(5): 805–811.
- Wiertz, C., & de Ruyter, K. 2007. Beyond the Call of Duty: Why customers contribute to firm-hosted commercial online communities. *Organization Studies*, 28(3): 347–376.
- Wilden, R., & Gudergan, S. P. 2015. The impact of dynamic capabilities on operational marketing and technological capabilities: investigating the role of environmental turbulence. *Journal of the Academy of Marketing Science*, 43(2): 181–199.
- Wilden, R., Devinney, T. M. and Dowling, G. 2016. The architecture of dynamic capability research: Identifying the building blocks of a configurational approach. *The Academy of Management Annals*, 10(1): 997-1076.
- Winter, S. G. 2003. Understanding dynamic capabilities. *Strategic Management Journal*, 24(10): 991–995.
- Wynarczyk, P., Piperopoulos, P., & McAdam, M. 2013. Open innovation in small and medium-sized enterprises: An overview. *International Small Business Journal*, 31(3): 240–255.
- Yoo, Y., Boland, R. J., Lyytinen, K., & Majchrzak, A. 2012. Organizing for innovation in the digitized world. *Organization Science*, 23(5): 1398–1408.
- Yoo, Y., Henfridsson, O., & Lyytinen, K. 2010a. Research commentary —The new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research*, 21(4): 724–735.
- Yoo, Y., Lyytinen, K., Thummadi, V. and Weiss, A. 2010b. **Unbounded innovation with digitalization: A case of digital camera**. Paper presented at the 2010 Annual Meeting of the Academy of Management.
- Zahra, S. A. & George, G. 2002. Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2): 185-203.
- Zahra, S. A., Sapienza, H. J., & Davidsson, P. 2006. Entrepreneurship and dynamic capabilities: A review, model and research agenda. *Journal of Management Studies*, 43(4): 917–955.
- Zittrain, J. 2006. The generative internet. *Harvard Law Review*, 119: 1974-2040.
- Zollo, M., & Winter, S. G. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3): 339–351.
- Zott, C. 2003. Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. *Strategic Management Journal*, 24: 97-125.

DOCTORAL THESES

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- 18 Johansson, Sven-Erik, 1976, *Fåmansbolag*. Uppsala: Research Report nr 1976:1. (mimeo).
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